

Old Dominion University

Graduate
Catalog
2014 - 2015

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Welcome

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Nature of Announcements

Announcements contained in this publication are subject to change without notice and may not be regarded in the nature of binding obligations to the University. The University reserves the right to change any provisions or requirements. Only the Provost or designee can approve changes to the Catalog except where otherwise stated within.

When students matriculate with Old Dominion University, they come under the academic requirements of the edition of the Catalog at that time. Students may graduate under these academic requirements within a period of six years even though subsequent Catalogs may change. Academic requirements include competency requirements, general education requirements, grade point average requirements, major and minor course requirements, foreign language requirements, overall unit requirements and related curriculum matters. Grading practices, tuition, fees and other matters are not considered to be "academic requirements" and are subject to change at the discretion of the University.

Should new changes be to their advantage, undergraduate students may graduate under the conditions of the newer catalog. However, because academic programs are subject to requirements imposed by outside accrediting or certifying agencies, the Commonwealth of Virginia, and the United States of America, such outside requirements take precedence.

It is the policy of Old Dominion University to provide equal employment, educational and social opportunities for all persons, without regard to race, color, religion, sex (including pregnancy), national origin, age, veteran status, disability, political affiliation, sexual orientation or genetic information. Old Dominion University complies with the Family Rights and Privacy Act of 1974 (as amended).

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Student Responsibility for Catalog Information

Students are held individually responsible for the information contained in the University Catalog. Failure to read and comply with University regulations will not exempt students from whatever penalties they may incur.

Welcome Letter from the Provost

Welcome to Old Dominion University! Located in the City of Norfolk, in the Hampton Roads Metropolitan area of coastal Virginia, ODU is a vibrant multi-cultural and student-centered campus community. Our more than 5,000 graduate students include over 483 international students who represent 80 foreign countries. Our campus also extends well beyond Norfolk. ODU offers numerous distance learning courses and degree programs using Internet technologies. Students have the opportunity to take courses "*Right Where You Are*," whether you are located at a community college site or higher education center within the Commonwealth of Virginia, on one of the various military bases or corporations that we serve, or at an out-of-state location.

Old Dominion University offers a broad range of postgraduate licensures and certificates in addition to Master's, Ph.D., and professional doctoral degree programs from our colleges of Arts & Letters, Business & Public Administration, Education, Engineering & Technology, Health Sciences, and Sciences. ODU is a leader in interdisciplinary programs too, such as in Modeling & Simulation, Cybersecurity, Global Health, and International Studies, among many others.

The faculty of ODU brings a wealth of talent and enthusiasm to our classrooms each day. Graduate students have the opportunity to work collaboratively on cutting-edge research projects with faculty who have received prestigious state, national, and international awards for teaching, research, and service. Our Frank Reidy Research Center for Bioelectrics, Center for Accelerator Science, Center for Innovative Transportation Solutions, Vision Lab, and Climate Change/Sea Level Rise Initiative are just a few examples of the cutting edge research areas that engage our faculty and their students. Their lively and provocative teaching, innovative scholarship, research that is both fundamental and applied, and commitment to academic excellence and creativity, combine into a fusion of ideas and practice that makes the Old Dominion experience a truly rewarding one for all students.

I look forward to seeing you on the Old Dominion University campus or at one of our distance learning sites.

Carol Simpson
Provost

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Academic Calendar

First Semester 2014-15

Date	Day	Event
August 23	Saturday	Classes begin
September 1	Monday	Labor Day Holiday
October 11-14	Sat-Tues	Fall Holiday
November 4	Tuesday	Last day to withdraw from classes
Nov. 26 - 30	Wed-Sun	Thanksgiving Holiday
December 5	Friday	Classes end
December 6	Saturday	Exams begin
December 12	Friday	Exams end
December 13	Saturday	Commencement

Second Semester 2014-15

Date	Day	Event
January 10	Saturday	Classes begin
January 17-19	Sat-Mon	Martin Luther King, Jr. Holiday
March 9-14	Mon-Sat	Spring Holiday
March 31	Tuesday	Last day to withdraw from classes
April 28	Tuesday	Classes end
April 29	Wednesday	Reading Day
April 30	Thursday	Exams begin
May 7	Thursday	Exams end
May 8, 9	Friday, Saturday	Commencement Exercises
May 9	Saturday	Degree Conferral Date

Summer 2015

Date	Day	Event
May 18	Monday	Session 1 and 3 classes begin
May 25	Monday	Holiday - no classes held
June 27	Saturday	Session 1 classes end (including exams)
June 29	Monday	Session 2 classes begin
July 3	Friday	Holiday - no classes held
August 7	Friday	Session 3 classes end (including exams)
August 8	Saturday	Session 2 classes end (including exams)

First Semester 2015-16

Date	Day	Event
August 22	Saturday	Classes begin
September 7	Monday	Labor Day Holiday
October 10-13	Sat-Tues	Fall Holiday
November 3	Tuesday	Last day to withdraw from classes
November 25-29	Wed-Sun	Thanksgiving Holiday
December 4	Friday	Classes end
December 5	Saturday	Exams begin
December 11	Friday	Exams end
December 12	Saturday	Commencement exercises

Second Semester 2015-16

Date	Day	Event
January 9	Saturday	Classes begin
January 16-18	Sat-Mon	Martin Luther King Jr. Holiday
March 7-12	Mon-Sat	Spring Holiday
March 22	Tuesday	Last day to withdraw from classes
April 25	Monday	Classes end
April 26	Tuesday	Reading Day
April 27	Wednesday	Exams begin
May 4	Wednesday	Exams end
May 6, 7	Friday, Saturday	Commencement exercises
May 7	Saturday	Degree Conferral date

Summer 2016

Date	Day	Event
May 16	Monday	Session 1 and 3 classes begin
May 30	Monday	Holiday - no classes held
June 25	Saturday	Session 1 classes end (including exams)
June 27	Monday	Session 2 classes begin
July 4	Monday	Holiday - no classes held
August 5	Friday	Session 3 classes end (including exams)
August 6	Saturday	Session 2 classes end (including exams)

General Information

History

Old Dominion University began its tradition of excellence when it was founded in 1930 by the College of William and Mary, the second oldest university in the United States. Established as an extension of William and Mary in Williamsburg, Virginia, and Virginia Polytechnic Institute in Blacksburg, Virginia, Old Dominion began educating teachers and engineers. The two-year school rapidly evolved into a four-year institution, and was granted independence in 1962 as Old Dominion College.

Considerable growth in enrollment, the expansion of research facilities and preparation for the addition of graduate programs led the Board of Visitors to approve the name change to Old Dominion University. Now Old Dominion is a powerhouse for higher education with six colleges: Arts and Letters, Business, Education, Engineering and Technology, Health Sciences and Sciences. Old Dominion has offered master's degrees since 1964 and Ph.D.s since 1971. Students currently choose from 69 baccalaureate programs, 55 master's programs, two education specialist programs and 42 doctoral programs. The University has achieved designation as a Research University (high research activity) from the Carnegie Foundation for the Advancement of Teaching.

Proud of its past, Old Dominion constantly looks to the future and prides itself on its continually expanding research and teaching programs. An ever-evolving university, Old Dominion is an agent of change for its students, for the region and the nation it serves. Old Dominion is Virginia's forward-focused, public doctoral research university for students from around the world who want a rigorous academic experience in a profoundly multicultural community. Our nationally recognized faculty use real-world expertise and innovative teaching methods to challenge students to achieve their highest goals. Our determined entrepreneurial approach to problem-solving drives cutting-edge research, eminent scholarship and strategic partnerships with government, business, industry, organizations and the arts.

Students

The students at Old Dominion share a special sense of excitement derived in part from the rich tapestry of backgrounds, cultures and ages represented here. Our students hail from all 50 states and more than 100 countries. Studying in this multicultural, international environment, and taking advantage of our guaranteed internship program, offers students a true edge after they graduate and begin to compete for jobs in the "real world."

Among ODU's outstanding students in recent years are a Rhodes Scholar, Truman Scholar and three USA Today Academic All-Americans, as well as the first undergraduate in the commonwealth of Virginia to earn a patent. The University's alumni ranks include an Emmy Award-winning television producer, a United States Air Force astronaut, the former Vice Chief of Naval Operations, the commander, U.S. Central Command, the former chief of surgery at Walter Reed Army Medical Center, award-winning authors, engineers and scientists, and professional coaches and athletes.

More than 19,500 undergraduates and 5,000 graduate students comprise the Old Dominion student body. Residence halls and apartments on campus house more than 4,500 students, while many other students live nearby within walking distance of the campus. Another 4,000 are distance learners located throughout Virginia and other states - even on ships at sea - who rarely ever set foot on the campus. A significant percentage of students are in some way connected to the military.

Students in search of extracurricular activities don't have far to look. The University boasts more than 300 student clubs and organizations. The Office of Leadership and Student Involvement (LSI) sponsors a wide variety of programs that complement academic excellence, offer a supportive environment, engage students in various learning experiences and provide them with opportunities to interact with a diversity of groups and individuals. LSI is primarily responsible for commuter services, clubs and organizations, Greek-letter organizations, leadership programs, service and volunteerism, and weekend activities.

The Norfolk Campus and Region

Situated on 251 acres near downtown Norfolk, Old Dominion University's main campus stretches from the Elizabeth River to the Lafayette River, and watching sunsets on the water is a natural pastime for our students. With its garden areas, reflecting pools and spacious green lawns bordered by tree-lined walkways, the campus offers the best of both worlds - a beautiful setting and just minutes away from Hampton Roads' largest cities.

One of the most exciting developments on the campus today is the University Village, with its impressive centerpiece, the Ted Constant Convocation Center, which opened its doors in 2002 and hosts everything from basketball games to concerts to commencements. This 75-acre development at the east end of campus is home to 960 modern student apartments, a variety of restaurants and shops, a hotel, research facilities, an art gallery, and bookstore.

On the main campus, at the west end of the grassy, five-acre Kaufman Mall, lies Webb University Center, a spacious facility that dazzles with its two-story glass facade, creating an outdoor ambiance and providing a sunny home - in any season - for student life. At the north end of campus, a stroll along the brick sidewalks of the Williamsburg Lawn, with its towering willow oak trees, offers students and visitors a trip back in time to the beginnings of the University.

Old Dominion's 75th anniversary in 2005 found an impressive array of cutting-edge facilities that have created a campus that's ideal for the pursuit of a diverse number of majors. Among these are the fully automated Perry Library, with more than 2.4 million titles, state-of-the-art laboratories in the sciences and engineering, the E.V. Williams Engineering and Computational Sciences Building, and the new Systems Research Building. The campus is also home to Pretlow Planetarium, the Lions Child Study Center, new, superior facilities for clinical work in the health sciences, a modern Oceanography and Physics Building, the Gornto TELETECHNET Center and the Dieln Fine and Performing Arts Center. Recent additions include the Student Success Center and Learning Commons, an orchid conservatory and research building, as well as renovation to the Technology Building and the Batten Arts and Letters Building, all of which will further provide expanded opportunities for our students in the arts, sciences, health sciences and engineering. The campus boasts a variety of indoor and outdoor sports facilities. A completely new student recreational center opened in 2009.

Further enhancing the on-campus engineering and science curricula, the University has a significant presence in the Applied Research Center at the Department of Energy's Jefferson Laboratories in Newport News; continues to expand its Reidy Research Center for Bioelectronics and the Virginia Modeling, Analysis, and Simulation Center on the Portsmouth-Suffolk border; and owns and manages the Blackwater Ecological Preserve in Zuni.

The University Village is home to several new and renovated facilities in the performing and visual arts. The University Theatre hosts performances ranging from modern dance through classical drama on a traditional proscenium stage. More experimental performances are held in the "black box" setting of the adjacent Goode Theatre. Across Monarch Way, the Department of Art is housed in the newly constructed Barry Arts Building and the soon-to-be constructed James A. Hixon Art Studio Building and Annex. Together they will offer state of the art studios in printmaking, drawing, painting, fibers, graphic design, and metalsmithing. The nearby Baron and Ellin Gordon Art Galleries exhibits works by well-known twentieth- and twenty-first century self-taught artists.

Only 20 miles from the sand and surf of Virginia Beach and just 40 miles from historic Williamsburg, ODU's Norfolk campus, in one of the nation's oldest seaports and one of today's busiest international seaports on the east coast, offers an attractive location for study and leisure. Prospective students and families are welcome to visit the campus Monday through Saturday throughout the year.

Faculty

More than 750 full-time and 650 part-time faculty bring a wealth of talent to our classrooms each day. Their lively, provocative teaching, research and

applied experience, along with their commitment to academic excellence, combine to make the Old Dominion experience a rewarding one for students.

Many of our faculty have been recognized on the state and national levels with awards for teaching, research and service. Since 1990, Old Dominion University faculty have won three professor of the year awards from the Carnegie Institute for the Advancement of Teaching, one Humboldt Award, three Virginia Outstanding Scientist awards sponsored by the Science Museum of Virginia, and 27 Virginia Outstanding Faculty Awards that are sponsored by the State Council of Higher Education for Virginia. Among our faculty ranks you will find nationally and internationally recognized scientists, engineers, educators and authors.

Faculty also serve as the primary academic advisers to our students, beginning in the freshman year. These relationships offer a special opportunity for new students to understand their chosen majors from the perspective of extensive experience and insight that only a professor can offer.

Because of our location and our relationship with dozens of corporations, federal facilities, the armed services, health care services and the tourist industry, faculty at Old Dominion bring a real-world, problem-solving focus to the classroom that makes learning come to life.

A Global Vision

Old Dominion University has made an extraordinary commitment to be recognized as a globally focused institution. This commitment is reflected in a series of recent innovations including:

- International Student Leadership Awards for outstanding leadership and academic achievement to Old Dominion's diverse international student community
- Provost Award for Leadership in International Education, recognizing faculty leadership in program innovation
- Dean's Education Abroad Awards, expanding financial support to bring study abroad within reach for more undergraduates
- ICAP, adding a global dimension to the University's innovative Career Advantage Program
- The Office of International Programs, a comprehensive support office that facilitates continued global exploration and innovation

For more information visit www.odu.edu/oduhome/international.shtm.

Outside the Classroom

Clubs and organizations for nearly every interest—more than 300 in all—thrive at Old Dominion, nurturing the personal and social development that is essential to the University experience. Clubs for every college and most majors, sororities and fraternities, an Honor Council, Student Government, Student Activities Council, and numerous recreational sports teams and athletic clubs make it easy to get involved at Old Dominion. In addition, ROTC programs are available for the Navy, Army and Marine Corps.

The benefits and rewards of joining one or more student organizations vary depending on you! Some of the best reasons for getting involved are making new friends, leadership development, taking advantage of opportunities, exploring careers and gaining that Monarch Pride!

Eighteen NCAA Division I sports bring pride and spirit to campus life each year, including football, and Old Dominion Monarchs have won 32 team and individual national titles, including four in basketball, nine in field hockey and 15 in sailing.

The Mission of the University

Mission

Old Dominion University, located in the City of Norfolk in the metropolitan Hampton Roads region of coastal Virginia, is a dynamic public research institution that serves its students and enriches the Commonwealth of Virginia, the nation and the world through rigorous academic programs, strategic partnerships, and active civic engagement.

Background

Old Dominion University is located in Hampton Roads, one of the world's major seaports. Since the early seventeenth century, Hampton Roads has been the state's gateway to the rest of the world and the world's gateway to Virginia in commerce and industry, in recreation and culture, and in national security. Now a complex of seven major cities, it is a microcosm of the opportunities and challenges of contemporary urban America. It is also a major center for research and development and a home for extensive scientific and technological activities in marine science, aerospace, ship design and construction, advanced electronics, and nuclear physics.

The University takes its unique character from Hampton Roads as it provides leadership to the state and nation in teaching, research, and service. Thus the University has a special mission for the Commonwealth in commerce, and in international affairs and cultures. It has a significant commitment in science, engineering and technology, particularly in fields of major importance to the region. As a metropolitan institution, the University places particular emphasis upon urban issues, including education and health care, and upon fine and performing arts.

As one of America's major ports, Hampton Roads is the locus of national and international military commands, and the home of a culturally diverse population. The University therefore has natural strengths in activities having international outreach. Faculty members in such fields as business, economics, international studies, geography and the sciences strive to design curricula, teach courses, and encourage foreign exchanges that enhance the University's role as Virginia's international institution.

The Hampton Roads scientific environment provides special opportunities for science and engineering faculty to emphasize research and graduate programs in such fields as marine science, aerospace, and advanced electronics. Global ocean studies and cooperative research at NASA receive particular attention, as University researchers collaborate with U.S. and foreign engineers and scientists.

Urban issues are addressed by programs in public administration, education, the social sciences, and the health professions. The richness of Hampton Roads' artistic life gives great vitality to the University's programs in the visual arts, music, theater, and dance.

Mission Support

Old Dominion University serves the needs of several internal and external constituents with its resources. These include: current and prospective students seeking undergraduate, graduate, and continuing education programs; business and industry; government agencies at all levels; the military; research organizations; and the community at large regionally statewide, nationally, and internationally. These constituencies are discussed in greater detail in the following paragraphs.

Old Dominion University offers a wide array of undergraduate programs, all of which meet national standards of excellence. Every Old Dominion undergraduate student follows a general education program that is designed to develop the intellectual skills of critical thinking and problem solving and to encompass the breadth of understanding needed for personal growth and achievement and for responsible citizenship. This general education program places special emphasis upon appreciation of the arts and upon understanding the perspectives of women, minorities, and non-Western cultures. Each undergraduate chooses a major program in the liberal arts or sciences or in a technological or professional field.

Old Dominion University's graduate offerings are focused on society's need for advanced professional education and on specialized programs at the master's and doctoral levels for which the institution is prepared through unusual strength of faculty or special geographic advantages. All graduate programs meet national standards of excellence.

As a national leader in the field of technology-delivered distance learning, the University strives to enhance the quality of the educational experience, wherever education is delivered, by applying emerging technologies. It also supports research to explore the impact of these technologies on the teaching-learning process. By utilizing these technologies and by partnering with institutions of higher education, corporations, and governmental

entities, the University is able to provide undergraduate and graduate degree programs to students across time and geographic boundaries.

Because of its commitment to Hampton Roads and its emphasis on creative innovation, Old Dominion University offers life-long learning opportunities through credit and noncredit courses and brings educational services and programs to the people of Hampton Roads at several off-campus centers. The University has a responsibility to serve the many members of the military services and their families. The military forms a unique combination of national and international constituents because they are from other locales in the United States and are looking to become, among other things, internationally capable in an international environment.

As a center of learning, Old Dominion University is committed to the principle of free inquiry. The University faculty of distinguished teacher-scholars seek to pass on the best in academic tradition while establishing themselves at the forefront of discovery and creativity. As partners in the development of the University's future, the faculty enjoy full academic freedom and have a recognized role in the decision-making process of the University. Mindful of present and future needs for a multicultural academic climate, the University deems recruitment and retention of minority and women faculty members and staff to be essential.

The University is committed to providing the highest quality instruction to all of its students. Teaching excellence is encouraged through faculty development programs and appropriate recognition of superior instruction.

The discovery of new knowledge through research and creative endeavor is a central function of Old Dominion University, which values and supports faculty participation in the discovery, synthesis, application and creation of new knowledge and art forms. The institution shall promote and preserve excellence in basic and applied research as a Carnegie Foundation Doctoral Research-Extensive University which is a key production and coordination force in technology development.

The University encourages the involvement of its faculty and staff in community service. The enrichment of the lives of students and residents of Hampton Roads is fostered through University sponsored cultural activities, fine and performing arts events, and intercollegiate athletics. In addition, through applied research, consulting, and other activities, the University plays a prominent role in the development of local business and industry and serves as a resource of government agencies and both public and private educational institutions.

The University seeks in its student body a diversity of age, gender, ethnic, religious, social, and national backgrounds. It actively recruits American minority students along with students from other countries worldwide in such numbers as to have their presence make a discernible impact upon the University's educational processes. Old Dominion recognizes its mandate to serve both the academically gifted and those who have the potential for academic success despite educational, social, or economic disadvantages.

Extracurricular activities and experiences are offered that challenge students to develop a personal system of values, to think and act autonomously, to achieve physical competence, and to establish a sense of their own identity. Other services help students meet educational, personal, and health needs.

Old Dominion University depends on its alumni for advice, leadership, and support. In close collaboration with the University, the Alumni Association provides to former students opportunities to continue their participation in various aspects of university life, to advance their personal and professional development, and to sustain communication and strengthen bonds with their alma mater and fellow alumni.

To evaluate its accomplishments against its goals, a continuing process of systematic assessment is given high priority by the University. Information gained from such efforts is utilized to ensure the highest possible quality for all University programs. The Board of Visitors will conduct a periodic review of the University's mission and major goals in conjunction with representatives of the major University constituencies. The review will ensure that the mission clearly identifies the University's unique role in Virginia's public higher education system and assures that the University is

focusing its resources to be the best that it can be in that role to achieve its mission and accomplish the major goals.

Adopted by the Board of Visitors
June 10, 1971
Revised January 17, 1989
Revised April 15, 1999
Revised June 14, 2002
Revised April 8, 2010

Major Goals of the University

1. Students

Old Dominion University is a selective admission institution. The University strives to serve those students in the immediate geographical area as well as attract students from the national and international communities. Additionally, the University seeks to attract and serve a culturally and ethnically diverse student body. The University pays particular attention to identifying and admitting students who are academically gifted. As a major metropolitan university, Old Dominion University has a special commitment to serve those students who have been academically, socially, or economically disadvantaged, but who have the potential for academic success.

2. Faculty

Old Dominion University seeks to attract and retain a distinguished faculty of teacher-scholars. Its faculty enjoy academic freedom and have a recognized role in the decision-making process of the University. The University is committed to strengthening its faculty through the recruitment and retention of minorities and women.

3. Academic Programs

Undergraduate Programs

As a comprehensive university, Old Dominion University offers and develops quality liberal arts, science, technology and professional programs. Old Dominion University undergraduate students follow a general education program that emphasizes intellectual skills and the breadth of intercultural understanding necessary for personal growth and achievement and responsible citizenship. All Old Dominion University degree programs meet national standards of excellence.

Graduate Programs

Old Dominion University's graduate offerings are focused on society's need for advanced professional education and on specialized programs at the master's and doctoral levels for which the institution is prepared through unusual strength of faculty or special geographic advantages. In selected graduate programs, the University aspires to international leadership.

Special Emphasis Areas

Because Hampton Roads is a major international maritime and commerce center that is Virginia's window to the nation and world, the University has a special mission for the Commonwealth in commerce, and in international affairs and cultures. With the principal marine and aerospace activities of the Commonwealth concentrated in Hampton Roads, the University has a significant commitment to science, engineering and technology, specifically in marine science, aerospace and other fields of major importance to the region. Due to its location in a large metropolitan area, Old Dominion University places particular emphasis on urban issues, including education and health care, and on fine and performing arts.

4. Teaching

Old Dominion University is committed to providing the highest quality instruction to all of its students. Teaching excellence is encouraged through faculty development programs and appropriate recognition of superior instruction.

5. Research, Scholarship and Creativity

Old Dominion University is a center of learning committed to the principle of free inquiry. The University seeks to participate in the acquisition,

discovery, synthesis, application, and creation of new knowledge and art forms through research, scholarly endeavor and creative undertakings by faculty and students. In selected areas of research, scholarship and creativity, the University strives for international recognition.

6. Distance Learning

As a national leader in the field of technology-delivered distance learning, Old Dominion University is committed to providing academic programs to a diverse national and international population. The University seeks partnerships and alliances that will facilitate delivering those programs to place-bound students.

7. Life-long Learning

Old Dominion University is committed to the concept of life-long learning, and offers credit and noncredit courses throughout the region. The University seeks to develop off-campus centers to bring educational services and programs to the citizens of the region. Because of the major Armed Forces presence in Hampton Roads, the University is particularly cognizant of its responsibility to serve members of the military services and their families.

8. Community Service

Community service is an important part of the University's mission. Particular importance is attached to the enrichment of the lives of students and residents of Hampton Roads through University cultural activities, fine and performing arts events, and recreational, intramural and intercollegiate athletics. The University acts as a resource to business, industrial, health care and educational organizations, as well as to the agencies of local, state and federal government. The University is committed through applied research, consulting and other activities to playing a major role in advancing the overall development of Hampton Roads.

9. Student Life

The University provides opportunities for student development outside of the classroom. Programs are offered to enhance personal and social growth of individual students, to provide an exciting and stimulating collegiate environment and to enable students to cope with educational, career, and health needs. Students choosing to live in on-campus housing benefit from programs especially designed to promote student educational and personal development.

10. Alumni

Alumni are an important part of the University community. Through outreach programs, participation on advisory committees, and a variety of professional and social activities, the University maintains a close relationship with its alumni and seeks alumni involvement and support for planning and development purposes.

11. Quality

Improvement of the University is a continual process. The foregoing goals provide criteria for the rigorous and regular evaluation of the quality, pertinence and effectiveness of academic and other University programs. These goals also provide criteria for the assessment of student achievement and the performance of members of the faculty, administration, and staff.

Adopted by the Board of Visitors
January 17, 1989
Revised April 15, 1999

General Statement of Policy

Within the limits of the University's facilities as to numbers that can be accommodated, admission to Old Dominion University is open to all qualified students without regard to race, color, religion, national origin, sex (including pregnancy), age, veteran status, disability, political affiliation, sexual orientation, gender identity, or genetic information; the facilities and services of the University are open to all enrolled students on those same bases, and all policies and standards of the University, including those governing employment, are applied accordingly. Students having concerns

of this nature should contact the assistant vice president for institutional equity and diversity.

Accreditations

Old Dominion University is accredited by the Southern Association of Colleges and Schools Commission on Colleges to award baccalaureate, masters, education specialist, and doctoral degrees. Contact the Commission on Colleges at 1866 Southern Lane, Decatur, Georgia 30033-4097 or call 404-679-4500 for questions about the status of Old Dominion University.

Numerous programs of study at the University are accredited by specialized accrediting agencies that are recognized by the Council on Higher Education Accreditation (CHEA), the U.S. Department of Education, and other agencies.

The baccalaureate degrees in civil engineering, computer engineering, electrical engineering, and mechanical engineering are accredited by the Engineering Accreditation Commission (EAC) of ABET, <http://www.abet.org/>. The engineering technology programs in civil engineering technology, electrical engineering technology, and mechanical engineering technology are accredited by the Engineering Technology Accreditation Commission (ETAC) of ABET, <http://www.abet.org/>

The teacher education unit in the Colleges of Arts and Letters, Education and Sciences is accredited by the National Council for Accreditation of Teacher Education (NCATE). The following programs are nationally recognized through their specialized professional associations and NCATE: English/language arts, math, reading specialist, elementary education, special education, educational leadership, library science, technology education, and middle school. The graduate program in music education is accredited by the National Association of Schools of Music. The Children's Learning and Research Center is accredited by the Southern Association of Colleges and Schools Commission on Colleges and Council on Accreditation and School Improvement (SACS/CASI).

The park, recreation and tourism studies program is accredited by the Council on Accreditation for Parks, Recreation, Tourism and Related Professions (COAPRT). The undergraduate program in exercise science is accredited by the Commission on Accreditation of Allied-Health Education Programs (CAAHEP). The graduate program in speech-language pathology is accredited by the Council on Academic Accreditation in Speech-Language Pathology of the American Speech-Language-Hearing Association. The community, mental health, school, and college counseling master's and counselor education doctoral degree programs are accredited by the Council on Accreditation of Counseling and Related Educational Programs (CACREP).

The doctoral program in clinical psychology is accredited by the American Psychological Association. The undergraduate program in chemistry is American Chemical Society certified.

The undergraduate and graduate business programs of the Strome College of Business are accredited by The Association to Advance Collegiate Schools of Business (AACSB)-International. The undergraduate and master's degrees in accounting are also accredited by the AACSB-International. The master's degree in public administration is accredited by the National Association of Schools of Public Affairs and Administration.

The program in dental hygiene is accredited by the American Dental Association Commission on Dental Accreditation. The baccalaureate and master's nursing programs are accredited by the Commission on Collegiate Nursing Education and approved by the Virginia Board of Nursing. Graduate nursing programs are accredited and approved by the Commission on Collegiate Nursing Education, the Pediatric Nursing Certification Board, the National Nurses Certification Corporation, American Nurses Certification Corporation, and the American College of Nurse Practitioners. The certified registered nurse anesthetist specialty is accredited by the Council on Accreditation of Nurse Anesthesia Educational Programs. The medical technology program is accredited by the National Accrediting Agency for Clinical Laboratory Sciences, 5600 N River Road, Suite 720, Rosemont, IL 60018, 773 714-8880. The physical therapy program is accredited by the American Physical Therapy Association, Commission on Accreditation in Physical Therapy Education (CAPTE). The graduate program in athletic

training is accredited by the Commission on Accreditation of Athletic Training Education (CAATE). The environmental health programs have been awarded accreditation from the National Environmental Health Science and Protection Accreditation Council. The nuclear medicine technology program is accredited by the Joint Review Committee on Educational Programs in Nuclear Medicine Technology. The Master of Public Health program has received accreditation from the Council on Education for Public Health. The cytotechnology certificate program is accredited by the Commission on Accreditation of Allied Health Education Programs (CAAHEP). The ophthalmic technology certificate program is accredited by the Committee on Accreditation for Ophthalmic Medical Personnel (CoA-OMP). The health services administration track in the Bachelor of Health Sciences is certified by the Association of University Programs in Health Administration (AUPHA).

The Department of Music is a full member of the National Association of Schools of Music. The Department of Art is a full member of the National Association of Schools of Art and Design. The theatre program is accredited by the National Association of Schools of Theatre.

Affiliations

The University is a member of the Southern Association of Colleges and Schools, the American Council on Education, the National Commission on Accrediting, the Council of Graduate Schools in the United States, the American Association of State Colleges and Universities, the American Association for Higher Education, the Association of American Colleges and Universities, the Association of Governing Boards of Universities and Colleges, the Association of Urban Universities, the Council for the Advancement and Support of Education, the National Association of State Universities and Land Grant Colleges, the National Commission for Co-op Education, the Southeastern University Research Association, the American Association of University Women, the University Extension Association, the National Society for Experiential Education, the Universities Space Research Association, the American Association of Collegiate Schools of Business, the National Council for Accreditation of Teacher Education, the Association of University Evening Colleges, the National Association of College and University Summer Sessions, the Association of Virginia Colleges, the Association of Schools of Allied Health Professions, the American Association of Dental Schools, the American Society for Engineering Education, the Consortium for Oceanographic Research and Education, and the Conference of Southern Graduate Schools. The University is also a Division I member of the National Collegiate Athletic Association (NCAA) and Conference USA (C-USA).

Old Dominion University is authorized by the Washington Student Achievement Council and meets the requirements and minimum educational standards established for degree-granting institutions under the Degree-Granting Institutions Act. This authorization is subject to periodic review and authorizes Old Dominion University to offer specific degree programs. The Council may be contacted for a list of currently authorized programs. Authorization by the Council does not carry with it an endorsement by the Council of the institution or its programs. Any person desiring information about the requirements of the act or the applicability of those requirements to the institution may contact the Council at P.O. Box 43430, Olympia, WA 98504-3430.

Distinguished Faculty Chairs and Professorships

In 1964, Virginia became the first state in the nation to establish an Eminent Scholars Program. Virginia encourages donors to create endowments to attract and retain outstanding faculty members by matching the income from these endowments, thus doubling the impact of the donors' gifts.

The generosity of several individuals and groups has made it possible for the University to establish chairs and professorships to support faculty members and their scholarly activities through this program. Included in these gifts are the following:

The P. Stephen Barna Professorship Endowment

Mr. E. James Hayes, a 1989 alumnus of Old Dominion University, established a professorship for aerospace engineering in the Frank Batten College of Engineering and Technology in 2003.

The Richard F. Barry, Jr. Chair

Established in 1997, this endowment provides support for a chair in the College of Sciences Department of Mathematics and Statistics. Richard F. Barry III, a former rector and member of the University's Board of Visitors and former Vice Chairman of Landmark Communications, Inc., created the endowment in honor of his father who taught mathematics at the University.

The Batten Chairs

The Batten Chairs were established in 2003 by Frank and Jane Batten. Mr. Batten, who passed away in 2009, was the retired Chairman and CEO of Landmark Communications and the first rector of the Board of Visitors. The Batten's \$32 million gift, the largest in Old Dominion's history, benefits all six of the University's colleges with emphasis to the Frank Batten College of Engineering and Technology and the College of Sciences. The Batten Chairs include:

- Batten Endowed Chair in Jewish Studies
- Batten Endowed Chair in Counseling
- Batten Endowed Chair in Computational Engineering
- Batten Endowed Chair in System of Systems Engineering
- Batten Endowed Chair in Bioelectronics Engineering
- Batten Endowed Chair in Micro- and Nano-electronics Engineering
- Batten Endowed Chair in Biomedical Engineering
- Batten Endowed Chair in Advanced Transportation Engineering
- Batten Endowed Chair in Science
- Batten Endowed Chair in Health Sciences

The Frederick Wharton Beazley Professorship

Created by an anonymous donor in 1988, the professorship in the Strome College of Business was established to honor Portsmouth philanthropist, Mr. F. W. Beazley.

The Bioinformatics Professor

The Bioinformatics Professor endowment was established in 1992 within the College of Sciences by the Department of Computer Science.

The Strome College of Business Endowed Professorship in Accounting

The Dean of the Strome College of Business established a professorship in 2006 to attract or retain an accounting scholar. The endowment was funded initially by KPMG Partners.

The Richard T. Cheng Chair in Computer Science

In 1998, former faculty member Dr. Richard Cheng endowed a chair in the department in which he helped establish accreditation. He is the former Chairman and CEO of ECI Systems and Engineering.

The Commonwealth Professorships

Provided by an anonymous donor as a substantial endowment gift in 1967, the endowment supports professorships in any of the University's six colleges.

The Constance F. and Colgate W. Darden Professorships

The Dardens endowed two professorships, one in education and one in history, in 1976. The Darden College of Education was named in honor of Mr. Darden, a U.S. Congressman, former Virginia Governor and President of the University of Virginia.

The Mina Hohenberg Darden Chair in Creative Writing

This endowed English department professorship was initiated in 1997 as a memorial to Mina Hohenberg Darden by her family and friends. Mrs. Darden received three M.A. degrees from Old Dominion and was working toward an M.F.A. in poetry.

The Diehn Chair in Music

The Diehn Fund, established by the estate of F. Ludwig Diehn, provided the funding in 1999 for a chair in music. The Diehn Fund also supports the Diehn Concert Series and the Diehn Fine and Performing Arts Center.

The Dragas Professorship in International Studies Endowment

This endowment was established in 1996 by the George and Grace Dragas Foundation to create a professorship in international studies. Mr. Dragas is an alumnus and former rector of the University's Board of Visitors.

The Ray Ferrari Endowed Professorship

Mr. E. James Hayes, a 1989 alumnus of Old Dominion University, instituted an engineering department professorship in 1997 to honor his mechanical engineering technology professor and mentor, Ray Ferrari.

The Mary Payne Hogan Endowed Professorship

Established in honor of Mary Payne Hogan, the endowment was created in 1997 by an anonymous donor. The professorship supports the College of Sciences, specifically in botany.

The Louis I. Jaffe Professorship

In 1968, an anonymous donor created a professorship in the College of Arts and Letters in memory of the Pulitzer Prize-winning editor of The Virginian-Pilot, Mr. Jaffe.

The George M. and Linda H. Kaufman Professorship

The Kaufmans endowed this professorship in 1985. A lectureship in public affairs also bears their name. Mrs. Kaufman is a former member of the Board of Visitors. Mr. Kaufmann led the effort to landscape the University's mall, which was named in honor of his parents.

The William E. Lobeck, Jr. Endowed Chair

Established in 2002 by the Lobeck-Taylor Foundation, this funding created an endowed chair in advanced engineering environments in the Frank Batten College of Engineering and Technology. Mr. Lobeck is an alumnus and former president of the Auto Nation Rental Group of Republic Industries.

The Mitsubishi Kasei Professorship in Manufacturing Engineering

The Mitsubishi Kasei Corporation in 1990 established this professorship in manufacturing engineering in the Batten College of Engineering and Technology.

The Ruth M. & Perry E. Morgan Endowed Professorship

Mr. Perry Morgan, former Editor-in-Chief of The Virginian Pilot, established a professorship in the College of Arts & Letters in 1996 in honor of his wife, Ruth. The incumbent must have a doctorate in American literature with an emphasis in Southern literature.

Rosanne Keeley Norris Professorship

Frederick J. Norris '78, through a bequest in his will, established a professorship in 2007 in memory of his mother, Mrs. Rosanne Keeley Norris, who devoted her career to primary education in the California and Massachusetts public schools. Mr. Norris desired to assist the University in attracting and retaining outstanding faculty in the Darden College of Education.

Oceanography Professorships

A challenge gift from the Norfolk Foundation in 1975 and gifts in response from corporations, friends, and alumni made possible an endowment to support several professorships in oceanography.

The Samuel L. and Fay M. Slover Chairs

A 1967 bequest from Mrs. Slover established an endowment that supports three chairs in oceanography. Col. Slover was the owner of The Virginian-Pilot and The Ledger Star.

The Oscar F. Smith Chair

The Oscar F. Smith Foundation made a grant in 1968 to establish an endowed chair in oceanography. The late Mr. Smith was president of Norfolk Shipbuilding and Drydock, Co., now Norshipco.

The William B. Spong, Jr., Professorship

In 1988, The Landmark Charitable Foundation endowed a professorship on behalf of The Virginian-Pilot and The Ledger Star to honor the former U. S. Senator and President of Old Dominion University. The professorship is for a faculty member in the Strome College of Business.

The Robert M. Stanton Chair in Real Estate and Economic Development

Mr. Robert M. Stanton, a 1961 alumnus of Old Dominion University and former rector of the Board of Visitors, established a chair in real estate and economic development in the Strome College of Business in 2003. The purpose of the chair is to help develop and enhance the Center for Real Estate and Economic Development into a nationally recognized institution. Mr. Stanton was the first chair of the Real Estate Foundation.

The Robert Stiffler Distinguished Professorship in Botany

The Robert Stiffler Distinguished Professorship in Botany was created in 2003 by an anonymous donor. The professorship in the College of Sciences honors 28 years of Robert Stiffler's service to The Virginian-Pilot and the community as a gardening columnist and expert. The chair will help Old Dominion University and the Norfolk Botanical Garden fulfill their research goals in the field of botany.

The Jesse and Loleta White Lectureship

Created in 1992 by the Aphasia Foundation of Virginia, this endowment supports a faculty position in the Child Study Center within the Darden College of Education.

E.V. Williams Faculty Fellowship Endowment

Established in 2005 through a bequest of Mr. E. Virginius Williams for the Strome College of Business.

E.V. Williams Endowed Chair in Strategic Leadership

Established in 2005 through a bequest of Mr. E. Virginius Williams for the Strome College of Business.

Educational Foundation

The Old Dominion University Educational Foundation is a nonprofit 501(c)(3) corporation chartered in 1955 to receive and manage gifts that support the educational mission of the University. As of December 31, 2013, the Foundation was responsible for managing approximately \$193 million of endowment assets, including \$11.9 million of University endowments. The Foundation is supported by the University's Office of Development and is governed by a Board of Trustees consisting of alumni and friends of the University.

Old Dominion Athletic Foundation

The Old Dominion Athletic Foundation is a nonprofit 501(c)(3) corporation chartered in 1964 to provide funds for the University to compete

successfully in intercollegiate athletic programs. The Foundation is governed by a Board of Trustees comprising alumni and friends of the University. Its activities are coordinated through the Department of Athletics and the Office of Development.

Real Estate Foundation

The Old Dominion University Real Estate Foundation is a nonprofit 501(c)(3) corporation chartered in 1994 to receive, acquire and manage gifts of real property for the benefit of the University. The Foundation manages a number of properties near the Norfolk campus and the Virginia Beach Higher Education Center, as well as the development of the University Village. The Foundation is governed by a Board of Trustees consisting of alumni and friends of the University.

International Programs

Marcelo Siles, Executive Director

The Office of International Programs (OIP) coordinates activities that focus on Old Dominion University's strategic commitment to campus-wide internationalization. These activities fall into three general categories, all of which are designed to expand student understanding of our interdependent world: encouraging the incorporation of international issues and perspectives into undergraduate and graduate education; facilitating international exchange of students and faculty; and sharing international interests and expertise with the broader Hampton Roads community that Old Dominion University seeks to serve. For more detailed information, visit the OIP website at www.odu.edu/oip.

OIP facilitates the development of the University's cooperative agreements and exchange programs with other institutions of higher learning around the world in order to encourage exchange of students and faculty as well as collaborative research. OIP staff provide advising support for international fellowships, such as the Fulbright, Boren Awards, and the Gilman International Scholarship Program.

OIP sponsors and coordinates international programs that serve and involve the citizens of the region and the state. These may include appearances by foreign diplomats, scholars and artists, workshops for teachers and other professionals, and support for internationally-focused community organizations.

OIP includes the Office of Study Abroad, the English Language Center, and International Student and Scholar Services.

Office of Study Abroad (OSA)

Increasing global awareness happens in both the classroom and elsewhere on Old Dominion's multicultural campus, but there is no substitute for traveling abroad to acquire a personal perspective on our increasingly interdependent world. Old Dominion students participate in a wide array of study abroad experiences as an integral part of their college education. Faculty-led programs of study in the summer and over spring break are available in different subject areas (from Service Learning in South Africa to Theatre in London to Business Studies in Korea and China). Semester and academic year study abroad programs and reciprocal student exchange programs offer long-term opportunities in virtually all areas of the world. Old Dominion is a member of study abroad consortia that sponsor high quality programs around the globe, providing opportunities for exchange with over 100 universities overseas. Regardless of one's field of study, almost all Old Dominion students can study abroad. Practically all forms of student financial aid may be applied to an academic program abroad, and travel grants are available for many programs. Dean's Education Abroad Awards are ODU scholarships that provide special support for selected majors. Internships, volunteer placements and short-term work opportunities overseas are additional options.

The Office of Study Abroad administers overseas academic programs and authorizes transfer credit from approved programs of study. OSA houses resources on study abroad opportunities and general reference materials on international travel, scholarships, internships and work abroad opportunities. A Study Abroad Fair is held every semester, and pre-departure orientation programs and "re-entry" sessions when students return from abroad are also

organized by the staff. Please visit the OSA's web site at www.odu.edu/studyabroad.

English Language Center (ELC)

The English Language Center (ELC) offers intensive English language classes (six seven-week sessions per year) for international students and members of the local international community in grammar, composition, reading/vocabulary, and speaking/listening at beginning to advanced levels. This academic program primarily focuses on teaching the academic English skills necessary for satisfying Old Dominion University's English proficiency requirement.

The ELC also provides semester-long Undergraduate and Graduate Bridge courses for students who have been conditionally admitted to the University and who need to improve their English language skills. The ELC administers the institutional TOEFL and SPEAK exams several times a year; a TOEFL preparation course is also available. Admission to ELC programs does not confer admission to other academic programs at Old Dominion University. Visit the ELC website at www.odu.edu/esl.

Visa and Immigration Service Advising (VISA)

The Old Dominion University community includes more than 1,100 international students and 100 visiting scholars from more than 100 foreign countries. Serving the cultural, immigration advising and personal needs of these individuals is the main mission of Visa and Immigration Service Advising (VISA). The office provides administrative support and documentation services along with information and regulatory advising that assist international students and scholars in achieving their academic and research goals. VISA also works closely with academic departments and administrative offices, offering workshops to staff members that help in building awareness of the international community's needs, as well as to develop and strengthen skills in intercultural communication. Among VISA'S specific offerings are immigration advising and individual assistance with the many cultural aspects of studying in a foreign country. VISA administers the International Student Leadership Award, which provides tuition support for undergraduate international students who demonstrate extraordinary leadership and academic involvement. Visit the VISA website at www.odu.edu/issv.

Distance Learning

Old Dominion University's Office of Distance Learning delivers graduate and upper-division undergraduate courses to students using a variety of technologies. Classes are delivered to students online and on-site at partnering community college locations, military installations, and higher education centers across Virginia. Additional on-site learning locations, also known as extended campus locations, are located in Washington state and in Arizona.

Courses in programs available at a distance are offered online using a variety of delivery technologies including **Online Asynchronous** - students access course material online from any location and complete coursework at their own pace (some same-time activity may be included and courses typically follow the traditional semester schedule) and **Online Synchronous or Web Conferencing** - students access class online during a live meeting using Adobe Connect or other 2-way desktop and mobile video conferencing systems, or attend class at an on-site learning location (classes may include a combination of 2-way chat, audio, or video.) For information about specific programs and available delivery formats, visit dl.odu.edu/programs.

Old Dominion University and the Virginia Community College System have a long-standing partnership making it easier for students to complete a bachelor's degree without leaving their local communities. With the Guaranteed Acceptance Agreement, students can complete the first two years of study toward a bachelor's degree at the community college and easily transfer to Old Dominion University to complete the degree program. Once accepted, students have the option of studying online, at any of over 40 Distance Learning locations, or at Old Dominion's main campus.

For more information about Distance Learning at Old Dominion University, visit <http://dl.odu.edu/>.

Title IX of the Education Amendments of 1972 prohibits discrimination based on sex in educational programs and activities. Sexual harassment and sexual misconduct have been recognized as a form of discrimination in violation of Title IX. For information, counseling or to file a complaint of discrimination or harassment on the basis of sex, individuals may contact the Title IX Coordinator, who is also the Assistant Vice President for Institutional Equity and Diversity, located at 1301 Spong Hall; the Assistant Vice President can be reached at (757) 683-3141 or rdunman@odu.edu.

Military Outreach

Old Dominion University is proud of its affiliation with military personnel and their families who represent all branches of the armed services. Students will find a variety of programs to match their personal and professional goals through the University's six colleges. Courses are available on campus and at a distance in live, synchronous, and anytime, asynchronous formats. Old Dominion operates sites on or near military installations in and outside Virginia where, depending on the location, students can take classes on the base. Distance learning counselors at all locations are trained to facilitate registration, admissions, and advising. Old Dominion accepts tuition assistance and serves the special needs of veterans, on campus or at distance, with a dedicated staff.

Old Dominion University is affiliated with the Service members Opportunity Colleges (SOC), DANTES, and Troops to Teachers. The University is a member of the GoArmyED network, the USAF's Associate's to Bachelor's Cooperative (AUABC), and the Navy's NCPACE and Distance Learning Partnership programs, all of which provide substantial credit for military training as well as flexibility, convenience, and affordability.

Regional Higher Education Centers

Old Dominion University operates three easily accessible higher education centers within metropolitan Hampton Roads, located in the cities of Hampton, Portsmouth, and Virginia Beach, where degrees, certificates and services are available for commuter students. These centers offer a wide range of academic programming, including bachelor-, master- and doctoral-level degrees, as well as noncredit and credit-bearing continuing education and professional development opportunities. Courses are conducted through multiple modes, including traditional face-to-face with instructor on-site, two-way video-conferencing, web-based (via multiple platforms such as WebEx and AdobeConnect), and hybrid programming; select classrooms are also equipped with course capture technologies. Co-curricular and student support services available on-site include admissions and registration assistance, academic advising, computer labs and access to the wireless network, testing and proctoring, bookstore, and access to the University's library. ODU-Virginia Beach also features the Meyera Oberndorf Learning Commons, Waves Cafe, a Writing Center, a satellite Career Management Center, and headquarters of the MSN-Anesthesia program and the ODU-Institute for Learning in Retirement. ODU-Peninsula provides headquarters for the Virginia Space Grant Consortium. ODU-Tri-Cities is headquarters for the bachelor's degree program in Ophthalmic Technology. Each facility also provides meeting, conference and training space for student and faculty clubs and organizations, government agencies, corporations, industry, nonprofits, and other educational partners. Resources include seminar/meeting rooms, teleconferencing, and technical support. In addition, the regional higher education centers support a diverse array of community engagement efforts, ranging from cultural and arts events free and open to the public, to partnerships with local public K-12 school districts. For more information, go to <http://www.odu.edu/regionalcenters>.

ODU-Peninsula
600 Butler Farm Road, Suite 2200
Hampton, Virginia 23666
757-766-5200 (switchboard); 757-766-5201 (fax)
phec@odu.edu
<http://www.odu.edu/peninsula>

ODU-Tri-Cities
1070 University Boulevard
Portsmouth, VA 23703
757-686-6220 (switchboard); 757-686-6219 (fax)
tttcc@odu.edu

16 General Information

<http://www.odu.edu/tricities>

ODU-Virginia Beach
1881 University Drive
Virginia Beach, VA 23453
757-368-4100 (switchboard); 757-368-4109 (fax)
vbhec@odu.edu
<http://www.odu.edu/vabeach>

Athletics

Old Dominion University's athletic program is among the most successful in the United States, boasting 28 team and four individual national championships, including three in women's basketball, nine in field hockey, 15 in sailing, a women's tennis clay court national crown, a men's basketball Division II title, and three individual wrestling Division II titles.

The Department of Intercollegiate Athletics is the home for Old Dominion University's 18 varsity programs for men and women. Old Dominion University offers competitive programs for student-athletes in the following sports:

- Football
- Men's and women's soccer
- Field hockey
- Men's and women's sailing
- Men's and women's basketball
- Wrestling
- Men's and women's swimming and diving
- Women's lacrosse
- Men's and women's golf
- Men's and women's tennis
- Baseball
- Women's rowing
- The University is reviewing additional intercollegiate program opportunities for women.

Old Dominion University is a Division I member of the National Collegiate Athletic Association (NCAA) and became a member of Conference USA (C-USA) on July 1, 2013. The 14 teams in C-USA for 2014-15 include: UNC Charlotte, Louisiana Tech, Marshall University, the University of Alabama-Birmingham, University of Southern Mississippi, Florida Atlantic University, Florida International University, Middle Tennessee State University, Old Dominion University, the University of North Texas, the University of Texas San Antonio, Rice University, the University of Texas El Paso and Western Kentucky University.

All full-time enrolled students are invited to attend intercollegiate athletic events free of charge. Beginning one week in advance of a regular season men's or women's basketball game and two weeks in advance of a football game, students can register online for admission to games at www.odusports.com/tickets (<http://www.odusports.com/tickets>) by entering their University Identification Number (UIN). A student's ID card will be activated after successfully registering for the ticket, and admission to the games is gained by swiping the University student ID card at the student entrances. A limited number of guest tickets are available for students to purchase for each game. For soccer, baseball, wrestling and other special athletic events, students are admitted at the gate by showing their current student ID card. For more information, call the Constant Convocation Center Box Office at (757) 683-4444, or check out the athletic website at www.odusports.com (<http://www.odusports.com>).

In addition, Old Dominion University provides students with a variety of recreational and intramural activities through its Recreation and Wellness Department. For more information on these activities contact the Recreation and Wellness Department at (757) 683-3384.

Title IX of the Education Amendments of 1972 prohibits discrimination based on sex in educational programs and activities. Sexual harassment and sexual misconduct have been recognized as a form of discrimination in violation of Title IX. For information, counseling or to file a complaint of

discrimination or harassment on the basis of sex, individuals may contact the Title IX Coordinator, who is also the Assistant Vice President for Institutional Equity and Diversity, located at 1301 Spong Hall; the Assistant Vice President can be reached at (757) 683-3141 or rduiman@odu.edu.

Policies and Procedures

Accommodations for Students with Disabilities

<http://www.odu.edu/content/dam/odu/policies/university/4000/univ-4500.pdf>

Code of Student Conduct

<http://www.odu.edu/policy/bov/bov1500/1530>

Electronic Messaging Policy for Official University Communication

<http://www.odu.edu/policy/university/3000/3506>

Firearms, Weapons, and Certain Related Devices

<http://www.odu.edu/policy/bov/bov1000/1013>

Gun & Weapon Regulation

<http://ww2.odu.edu/ao/facultyhandbook/index.php?page=ch06s16.html>

Incident Weather and Emergencies

<http://www.odu.edu/content/dam/odu/policies/university/1000/univ-1020.pdf>

Interim Suspension

<http://ww2.odu.edu/ao/facultyhandbook/index.php?page=ch06s36.html>

Old Dominion University Discrimination Complaint Procedure

<http://www.odu.edu/content/dam/odu/policies/university/6000/univ-6310.pdf>

Sexual Misconduct Policy

<http://www.odu.edu/content/dam/odu/policies/university/4000/univ-4600.pdf>

Sexual Harassment Policy

<http://www.odu.edu/content/dam/odu/policies/university/6000/univ-6320.pdf>

Smoking Policy

<http://www.odu.edu/content/dam/odu/policies/university/3000/univ-3220.pdf>

Stalking Policy

<http://www.odu.edu/content/dam/odu/policies/university/4000/univ-4601.pdf>

Student Complaint Procedure

<http://ww2.odu.edu/ao/facultyhandbook/index.php?page=ch06s35.html>

Student Record Policy

<http://www.odu.edu/content/dam/odu/policies/university/4000/univ-4100.pdf>

Title IX Concerns/Sexual Misconduct

Title IX of the Education Amendments of 1972 (20 U.S.C. § 1681) prohibits discrimination based on the gender of students and employees of educational institutions that receive federal financial assistance. In accordance with its Title IX obligations, the University has designated ReNee' S. Dunman, Assistant Vice President for Institutional Equity and Diversity, as the University's Title IX Coordinator. Questions regarding Title IX, as well as concerns and complaints of non-compliance, may be directed to her. She can be contacted at the Office of Institutional Equity and Diversity, 1301 Spong Hall, Norfolk, VA 23529, (757) 683-3141, rdunman@odu.edu. Additional information about Title IX may be found on the Equity and Diversity website at <http://www.odu.edu/equity>.

Academic Resources

University Libraries

The University Libraries include the Patricia W. and J. Douglas Perry Library, the Elise N. Hofheimer Art Library, and the F. Ludwig Diehn Composers Room. Each provides books, online journals, e-books, microforms, maps, musical scores, recordings, and other media in all fields of research and instruction. Library staff provide instruction and information services. Students can also find study space, wireless access, workstations, and equipment loans. Available online at www.lib.odu.edu are the library's catalog, scholarly journals and research databases via University and statewide Virtual Library of Virginia (VIVA) subscriptions. The University Libraries serve as a repository for U.S. and Virginia government publications in print and online formats. Through the Virginia Tidewater Consortium and VIVA, students and faculty may also borrow materials from participating academic libraries in Virginia.

The Elise N. Hofheimer Art Library

Barry Arts Building, Room 2008, 47th Street and Monarch Way, 683-4059. The Library contains specialized books, journals, online resources, audio-visual titles and other materials for students and faculty in the visual arts. Reserve materials for Art Department classes are available at the service desk. Individual and group study space, computers, viewing monitors, a scanner and a network printer/copier are available. Visit the Art Library at www.lib.odu.edu/hofheimer/index.htm.

The Diehn Composers Room

Diehn Fine and Performing Arts Center, Room 189; 683-4173. The F. Ludwig Diehn Composers Room houses music special collections, scores, music videos, sound recordings, and audio equipment. MIDI, multi-media, DVD, VCR, laser disc player stations, computers, scanner, and network printer/copier are available. Reserve materials for Music Department classes are available at the service desk. The Reading Room offers space for the study of manuscripts, scores, audio recordings, and other materials from the archival research collections. A Steinway grand piano affords scholars and researchers the opportunity to play selections from the composers collections as desired. Visit the Diehn Composers Room at www.lib.odu.edu/diehn/index.htm.

Perry Library

Perry Library offers many services and resources:

Learning Commons

1st Floor, 683-4178. The Learning Commons @ Perry Library is a collaborative project of the University Libraries, Information Technology Services, and the Student Success Center, providing year-round services with extended 24/5 hours during fall and spring semesters. The facility includes individual study space, as well as group collaboration, presentation practice, and sound rooms that can be reserved by students. Services include research assistance and resources, technology assistance, tutoring and writing centers, peer-to-peer tutoring, and other services supporting student success. Computers, wireless access, printers, scanners, copiers, GIS/digital media/other specialized software, and equipment loans are available. Information and reservations are available at <http://www.odu.edu/learningcommons>.

Circulation and Reserve Services

2nd Floor, 683-4154. Students with a valid University ID may borrow and renew books and other materials, as well as check out reserve materials. Graduate student study carrels are also available. Information on borrowing privileges, loan periods, and policies is available at www.lib.odu.edu/libraryservices/borrowing.htm.

Interlibrary Loan and Document Delivery Services

Room 1208, 683-4170, 4171. Interlibrary loan allows ODU students, faculty and staff to request journal articles, books, and other needed research materials not available in the University Libraries. The state's VIVA interlibrary loan agreement ensures that students, faculty and staff may

obtain items located in other Virginia libraries. Document delivery services provide copies of materials held in the University Libraries' collection to distance learners and other eligible students, faculty and staff. Interlibrary loan and document delivery requests can be submitted online through ILLiad, at www.lib.odu.edu/libraryservices/interlibraryloan.htm.

Accessibility Services

1st Floor, 683-4178. The Library Accessibility Room (Room 1309) in the Learning Commons provides specialized equipment and quiet space for students registered with the University's Office of Educational Accessibility (<http://www.odu.edu/educationalaccessibility>). Wheelchair accessible, the room can be reserved for individual use once an orientation program has been completed. The facility houses CCTV, workstations with ZoomText and JAWS, and other adaptive technologies. Quiet space is also available through the reservable study rooms on the upper floors of Perry Library. Orientation, reservations, and research consultation appointments are available through the Learning Commons Help Desk. The 2nd floor Circulation Services desk provides on-demand paging to students who need special assistance with retrieving materials from the upper floors. Information about accessibility is available on the University Libraries' web site at www.lib.odu.edu/libraryservices/accessibilityservices.htm.

Reference and Research Services

1st Floor, 683-4178. At the Learning Commons Help Desk, Reference and Research Services staff assist students and faculty in locating information, library research and technology use. Specialized staff provide direct individual assistance and consultation by appointment, telephone, e-mail and live online chat. While most scholarly journals and databases are available through online subscriptions, the University Libraries also houses circulating and reference print collections, including government publications. Distance learning students may obtain assistance by calling the Help Desk or linking to *Ask A Librarian* at <http://www.lib.odu.edu/contact/index.htm>.

User Instruction

Reference and Research Services staff offer information literacy classes, research classes, specialized workshops, and orientation sessions to assist graduate and undergraduate students with library research. Tutorials, online research guides, schedules of library workshops, and additional information on instruction services are located at www.lib.odu.edu/researchassistance/libraryclasses.htm.

Special Collections & University Archives

Room 3023, 683-4483. Special Collections & University Archives houses manuscripts, books and printed material relating to University, Virginia and Tidewater history. The University Archives includes theses and dissertations, oral histories, yearbooks, course catalogs, University publications, and photographs of yesterday and today. Special Collections contains diaries, letters, legal and campaign files, photographs, and maps from the Civil War, Virginia politics, military history, African-American history, Norfolk urban redevelopment, women's history, and local history. Visit Special Collections at www.lib.odu.edu/specialcollections/.

Information Technology Services (ITS)

Information Technology Services (ITS) offers faculty, staff, and students a wide range of technology services and support. The mission is to provide high-quality cost-effective computing and communications services that meet the needs of the University community.

As technology continues to change the face of higher education, ITS is committed to progressing Old Dominion University's innovative educational delivery processes and technology resources. ITS is focused on student support and is committed to assisting students with their technology needs in order for them to be successful in all their academic endeavors.

The ITS Help Desk is the first point-of-contact for IT applications and services and provides centralized technology support to students, staff, and faculty. The Help Desk is located on campus in Webb Center (Room 1504). A student team provides peer-to-peer and walk-up technical support to individuals with technology questions as well as on-site support for students in University housing.

How to Get Technical Support:

- **Email (24x7)** : Email itshelp@odu.edu with a detailed description of the problem for assistance
- **Phone (24x7)** : Call (757) 683-3192 anytime for technical assistance (toll free 877.348.6503)
- **In Person:** Walk-up service is available in Webb Center (Room 1504) Monday through Friday - 8 a.m. to 9 p.m. Saturday - 8 a.m. to 4 p.m.
- **Knowledge Base:** Search for answers to FAQs at <http://kb.odu.edu>
- **Online:** Requests for assistance can be submitted online. Login using the MIDAS ID and password at <http://fp.odu.edu>.

ITS provides, maintains, and/or manages the following systems and services University-wide:

- Computing accounts for faculty, staff, and students
- Academic & instructional systems
- Administrative computing systems
- Data & telecommunications networks
- High-speed wired and wireless Internet connectivity
- MonarchVision (Cable TV)
- Media technology equipment in support of academic and University-related activities

Detailed information about these services is provided in the following paragraphs. Additional information about all computer services at Old Dominion University can be found on the ITS web site at <http://www.odu.edu/its>.

Computer Accounts

In support of the University's mission of teaching, research, and other educational pursuits, ITS provides students with a MIDAS account (Monarch Identification and Authorization System). MIDAS is the identity and password management system for the University.

A MIDAS account uses a single ID and password to provide access to the University's integrated technology services such as: e-mail, course management systems, the myODU Portal, video streaming courses, and many other important resources.

Creating a MIDAS account

The account is created from the MIDAS web site at <http://midas.odu.edu>. Account activation is immediate for email purpose. Access to other University and services resources may require an additional 24-48 hours. During the creation process, a security profile is established that allows the account holder to create a new password without knowing the current password.

myODU Portal

The Old Dominion University myODU Portal, located at <http://my.odu.edu/>, provides University faculty, staff, and students a single point-of-access to their University services. Individuals may customize their portal page with links to the resources they access most frequently, including Blackboard, Leo Online, University-wide announcements, and Internet-based University email, address book and calendar.

Student E-Mail Accounts

Student email accounts are activated automatically as part of the MIDAS account creation process. Student email accounts are provided through Gmail and serve as a vital communication link between students and University administrators, departments and faculty members. It is the official electronic mail system for University-related communications, policies, announcements, tuition bills and other information. Student email access is available via the myODU portal at <http://my.odu.edu/>. Students can also access their email account at <http://monarchs.odu.edu>.

The Residential Network (ResNet)

ResNet is managed by ITS and provides students living in the University residence halls and the University Village apartments with high-quality data

(wired and wireless), voice, and video services. This program is supported by professional and student staff that provide technological services and support for high-speed internet access, cable television (MonarchVision), and personally owned computers and mobile devices. Sufficient wired internet connections are provided in the residence halls to allow each resident an individual connection that can be activated at the student's request. Students may also request local phone service if desired.

Computer Labs

ITS maintains University public computer labs equipped with Windows and Macintosh-based systems and various computer applications in support of class requirements. Laser printing is available in all labs as well as remote printing in academic buildings and residence halls. Students must have a University MIDAS account (see section on Computer Accounts) to use the computers in the labs. Labs are located in: Webb Center, Virginia Beach Higher Education Center, Peninsula Higher Education Center, and Tri-Cities Higher Education Center. Additional computing resources are also available in the Learning Commons as well as some academic buildings and residence halls. Lab schedules are available on the ITS web site at <http://www.odu.edu/ts/labs-classrooms>. IT consultants are available in all labs to provide assistance with application and computer-related questions and problems.

Virtual Computer Lab

ODU's Virtual Computer Lab is a software system that can provide 7 X 24 X 365 computer access to applications and systems for anyone that has access to a basic computer. It allows students to reserve a "virtual computer" with the desired operating system and applications via the Internet. The system has all the widely used applications at the University such as SAS, Matlab, SPSS, GIS and others. A University MIDAS account (see section on Computer Accounts) is required to access the ODU virtual computer lab. Please visit <http://www.odu.edu/ts/labs-classrooms/virtual> for more information.

Monarch Techstore

The Monarch Techstore is a University-owned and operated service where Old Dominion students, staff, and faculty can view, test, purchase, and order the latest technology products from a variety of companies. The Techstore sells computers, hardware, software, peripherals, and supplies to the University community at special educational discount pricing. A large portion of store profits goes directly to ODU's Student Scholarship Fund. Visit <http://www.odu.edu/techstore> for more information.

Mobile Monarch

Old Dominion University has established minimum technological requirements student computers must meet to effectively use the information technology resources offered at the University. It is strongly recommended that students have a notebook computer that at least meets the University's minimum technical specifications.

Mobile Monarch is a strongly recommended student notebook program that offers educational pricing for Apple and Dell computers. Computers in the program have been selected to meet the requirements of the University's academic computing environment.

Program notebooks are purchased at the Techstore and are typically business class systems with reliable standard components. The computers offered are sold with up to a four-year warranty. An on-campus support center is available to provide support services, including warranty repairs. Students who purchase recommended models from the Mobile Monarch program receive priority service at the ITS Help Desk.

Academic Software/Instructional Systems

Through the University's software licensing program, current versions and upgrades of McAfee Virus Scan software are available for students to download, free of charge, to their personal computers. Additional instructional software is available for download, such as EndNote and X-WIN 32. Visit the ITS Services and Software Catalog at <http://www.odu.edu/ts/software-services> to download software.

- Adobe Connect - Adobe Connect is an online web conferencing and collaboration tool that allows students and faculty to conduct same-time meetings and presentations. Meeting participants can interact through chats, screen sharing, file sharing, application sharing, multi-person video, dynamic white-boarding, and polling.
- Course Management System - ODU's interactive learning system Blackboard (<https://www.blackboard.odu.edu/>) helps faculty and students enhance the classroom experience by enabling continued class collaboration, facilitating feedback from peers and instructors, and allowing for unlimited access to course documents, reading assignments, and other supplementary materials. The course management system also incorporates web pages, email, discussion boards, chat rooms, online quizzes, virtual groups, and document sharing.

Preparing Future Faculty (PFF)

Preparing Future Faculty (PFF) is a national initiative sponsored by the Council of Graduate Schools and the American Association of Colleges and Universities and supported by many disciplinary organizations. The PFF program at ODU is open to all graduate students but is designed especially for those interested in an academic career. PFF offers two events a semester on topics such as teaching methods, portfolio development, grant writing, and the job application process.

Students can earn a PFF Certificate by participating in a mentored teaching experience and attending PFF and other professional development events. The PFF website also offers valuable resources for graduate students who are seeking their first academic job. For further information, go to the PFF website at <http://www.odu.edu/success/programs/pff/certificate>.

Research Resources

Office of Research

Old Dominion University is classified as a Research Institution having high research activity, according to the Carnegie Foundation. In FY 2013, its total research and development (R&D) including institutionally-financed expenditures amounted to \$99.14 million. In an effort to sustain, enhance and grow its research enterprise, Old Dominion's Office of Research serves the faculty, staff, and students by providing basic research administrative services. The office also provides interface with public and private members of the external community as well as federal and state agencies that have a vested interest in research. The office is led by the Vice President for Research and includes staff members who are able to leverage a breadth of experience and convey quality services related to development of research programs, regional economic development, compliance in the conduct of research, grant writing and development, intellectual property, technology transfer, and governance issues related to sponsored programs. Sponsored research administration services, encompassing the range of pre- and post-award grant and contract administration, in particular, are provided by the ODU Research Foundation.

While most of Old Dominion's research enterprise centers and entities are housed within specific colleges, the ones that are the most diverse in terms of their research focus and/or scope are configured within the Office of Research. The Virginia Modeling, Analysis, and Simulation Center (VMASC), the Frank Reidy Research Center for Bioelectrics, the Virginia Coastal Energy Research Consortium (VCERC), the Animal Facility and the Orchid Conservatory are five such entities.

VMASC is a multi-disciplinary modeling, simulation and visualization collaborative research center of Old Dominion University. With more than 100 industry, government, and academic partners, VMASC furthers the development and application of modeling, simulation, and visualization as an enterprise decision-making tool and promotes economic development through the transition of intellectual property to the commercial sector. Its core capabilities are: military modeling and simulation (primarily combat simulations), homeland security and homeland defense, medical simulations, social system modeling, transportation, serious gaming, virtual environments, and business and supply chain modeling. VMASC creates computer simulations and conducts program analyses to meet stakeholders' needs. Computer simulations provide the capability to: quickly and economically test theories and ideas; help visualize and understand complex situations; prioritize labor and capital investment opportunities; and reduce the risk inherent in business decisions. The research interests and capabilities of VMASC include: simulation methodologies, mathematical modeling, simulation inter-operability, verification and validation, distributed simulation, computer visualization, immersive virtual environments, human factors, social behavior, performance analysis, intelligent systems, decision support and collaboration methodologies, and modeling and simulation systems integration.

The Frank Reidy Research Center for Bioelectrics (FRRCB) is internationally recognized as a leader in the understanding of the interaction of electromagnetic fields and ionized gases with biological cells and the application of this knowledge to the development of medical diagnostics, therapeutics, and environmental decontamination. The center is part of an International Consortium for Bioelectrics that includes universities and research institutes from Japan, Germany, France and the United States. The objectives of the center are to perform leading edge interdisciplinary and multi-institutional research, recruit top faculty and exceptional graduate students, support regional, national and international programs, and increase external funding and institutional visibility. Research conducted at the FRRCB has already attracted substantial federal agency support including multiple grants from the National Institutes of Health, Department of Defense and the National Science Foundation. The FRRCB has expertise in pulsed power technology for biological and medical applications in the subnanosecond to the millisecond range and includes the design and modeling of pulse delivery systems. A wide range of research is conducted at the center including new cancer therapies, wound healing, decontamination, imaging and cardiovascular applications. As one of the

first institutions to apply this technology in medicine and biology, Old Dominion University anticipates the potential for proprietary use of the technology with both marketing and licensing opportunities.

The Virginia Coastal Energy Research Consortium (VCERC) is a multidisciplinary research unit charged by the Commonwealth to study and identify alternative solutions to problems arising from over-dependence on fossil fuels that is unsustainable and has become the single biggest threat to our environment, economy, and national security. Virginia, with its vast coastline, natural waterways and abundant sunshine, is ideally suited for a number of alternative energy applications. VCERC seeks out and develops new alternative energy research directions and evaluates viable renewable energy sources for Virginia with an initial focus on offshore winds and the conversion of coastal algal biomass to biofuels. At Old Dominion University, VCERC involves faculty researchers from the Batten College of Engineering and Technology and the College of Sciences, and is structured to operate in partnership with a number of Virginia institutions: Virginia Tech – Alexandria Research Institute, Virginia Institute of Marine Science, Norfolk State University, James Madison University, Virginia Commonwealth University, University of Virginia, and Hampton University. This statewide, inter-university network seeks to become a leader in the research and development of numerous alternative energy projects that are of direct benefit to local employment, manufacturing groups, state institutions, the students and staff of Virginia universities, and the public.

Research and Enterprise Centers

The University has established a number of research and enterprise centers. Please check the web pages of the Office of Research www.odu.edu/research and those of the individual colleges for information regarding centers in specific areas.

Research Policies

Students who receive compensation through sponsored research, tuition/fee waivers, scholarships, assistantships, or other financial arrangements are covered by Old Dominion University's Policy on Intellectual Property. This policy covers the ownership and use of copyrighted works, inventions, and any other form of intellectual property. In those cases where the University has a vested interest in intellectual property, the policy specifies how any revenues derived will be distributed between the inventor/author and the University. The policy can be found in its entirety at <http://www.odu.edu/content/dam/odu/offices/bov/policies/1400/bov1424.pdf>.

Students engaged in scientific research or other scholarly activity at Old Dominion University should also be aware of the University's Policy, Procedures and Timeline for Responding to Allegations of Misconduct in Scientific Research and Scholarly Activity. The policy can be found in its entirety in the Board of Visitors manual section on Research Policies at <http://www.odu.edu/about/policiesandprocedures/bov>.

Research Foundation

The Old Dominion University Research Foundation is a separate, private, not-for-profit corporation chartered under the laws of the Commonwealth of Virginia in 1965. The foundation serves as the fiscal and administrative agent to manage research and sponsored programs and aid in technology commercialization for Old Dominion University. The foundation's purpose is to promote the education, research and public service objectives of Old Dominion University by encouraging, advancing, fostering, and conducting research and sponsored programs in engineering, the physical and life sciences, the humanities, education, and all other branches of learning.

The foundation is the contracting agent for University research grants and contracts with external funding agencies. In fiscal year 2013, the Research Foundation received \$116 million in awards for research and sponsored programs. Research and sponsored program activity for fiscal year 2013, measured by amount of expenditures, totaled \$74 million for projects sponsored by federal, state, and local government agencies and a variety of corporations and private foundations.

Technical direction of a sponsored program remains the responsibility of the principal investigator. The foundation supports the University and assists investigators by providing a broad range of administrative and technical

support services. Among these services are: financial administration, budget preparation and monitoring, financial compliance guidance, proposal preparation and submission assistance, project payroll and human resources, financial reporting, technical reporting support, intellectual property administration, procurement and equipment inventory control.

Graduate Admission

Office of Admissions

The mission of the Office of Admissions is to recruit, admit and enroll students from throughout the United States and abroad who will contribute to the overall collegiate experience. Old Dominion University is open to all qualified students regardless of race, color, religion, gender (including pregnancy), age, national origin, veteran status, disability, political affiliation, sexual orientation or genetic information.

General Requirements for Admission

For regular admission, applicants must have earned a bachelor's degree from an institution accredited by a regional accrediting body or an equivalent degree from a foreign institution. An applicant must have earned at least a 2.80 cumulative grade point average (4.00 scale) for admission to a master's program and at least a 3.00 cumulative grade point average for admission to a doctoral program. Additional requirements are imposed by individual graduate programs. For specific program requirements, prospective students should consult the appropriate section of this catalog and contact the appropriate graduate program directors.

Students who apply before completion of undergraduate work may be admitted on the condition that the bachelor's degree is received before the beginning of actual graduate studies.

Students whose backgrounds are judged to be deficient in any specific area of study or whose undergraduate grades or test scores are below the required average may be admitted provisionally and asked to make up the deficiency by taking one or more courses at the undergraduate level. Graduate credit will not be awarded for these courses.

Standardized Tests

The Graduate Record Exam (GRE) or the Graduate Management Admission Test (GMAT) are normally required for admission. Test scores are considered valid for five years. Students with test scores older than five years should contact the program director for guidance.

Required by some programs, the Miller Analogies Test (MAT) is administered by appointment through the University Testing Center. Applicants should contact that office to make arrangements for taking the MAT.

Some programs require that students take the Exit Examination of Writing Proficiency, administered by the University's Writing Center, prior to completion of nine graduate hours of study. Graduate students in additional programs must take the Graduate Writing Proficiency Examination administered and evaluated by the College of Education.

Academic Testing

The University Testing Center is part of University College and is located in the Student Success Center. Personnel from the Testing Center administer University placement tests, College-Level Examination Program (CLEP) exams, DANTES, the Miller Analogies Test (MAT), and correspondence tests, and coordinate entrance and certification test administrations. For information on testing, please see the web site at <http://ww2.uc.odu.edu/elt/>.

Application Procedures

Individuals interested in graduate work at Old Dominion University should apply online at <http://www.odu.edu/admission/graduate> or contact the Office of Admissions to obtain the forms and information. The applicant must first complete the online Admissions application (including the application fee, when applicable), then arrange for the submission of official transcripts from each college or university previously attended. The completed application and supporting documents should be sent to the Office of Graduate Admissions by the deadlines established by the programs to ensure complete processing of an application. Transcripts are not required of the non-degree applicant for initial registration, but before embarking on further graduate study beyond the initial 6 credit hours, an official copy of previous college transcripts must be submitted.

Several programs of a highly competitive nature have early deadlines. Failure to submit a complete application by the program's established deadline date will result in removal of the application from consideration for admission. Applications that remain incomplete for 6 months after the initial deadline will be purged unless the student requests deferment to a subsequent semester.

Applicants should refer to <http://www.odu.edu/content/odu/academics/degree-programs.html#> for program application deadlines.

The Admission Decision

A written notice from the Office of Admissions or International Admissions, not letters from departments or faculty members, is certification of admission. Admission to graduate study may be limited by the number of places available in the various programs, colleges, schools, and departments of the University. Applicants are encouraged to apply early. The application process may span six to eight weeks depending on timely receipt of documents. After supporting credentials have been received and reviewed, applicants for admission are usually notified within 30 days of the action taken on their application.

International Student Admission

International students should apply only through the Office of International Admissions. U.S. Permanent Residents and Green Card holders should apply only through the Office of Admissions. The primary method of application is web-based; however, a paper application is available upon request. Along with the application and fee, officially issued academic records (transcripts) and evidence of English language proficiency are required. As a service to applicants, the Office of International Admissions evaluates all foreign academic credentials.

Application Process and Dates

Applicants must strictly adhere to international admission and specific program deadlines to allow for the evaluation of academic and financial credentials. Additional timeline considerations include the student visa application process and required attendance at various orientation programs conducted during the week prior to the beginning of classes. Admission deferments are granted for up to one calendar year (two semesters); beyond this allotted time, a new application, fee and academic credentials are required. Along with the application, fee and program specific requirements, all academic transcripts, translations and standardized tests must be official, sealed, stamped by the institution or testing agency and sent directly to the Office of International Admissions at Old Dominion University (CEEB code 005126). Officiating authorities include an institution's Registrar or Principle/Controller of Exams. When English is not the language of instruction, academic transcripts and course descriptions are required in one's native language and officially translated into English. Photocopies, notarized copies, or faxed copies of required official documents will not be accepted. Certified translations by a licensed or professional translator must accompany academic documents not written in English. Translations of official documents completed by the student will not be accepted. Credentials submitted during the application process become the property of Old Dominion University and cannot be returned.

F-1 & J-1 Student Visas

Students seeking an F-1 or J-1 non-immigrant student visa must demonstrate to both Old Dominion University and the U.S. consulate the financial ability to cover all expenses related to study and living in the U.S. Funding requirements include tuition, health insurance, living and personal expenses for the first year of study, in addition to a reasonable expectation of funding for the remaining years of study. Old Dominion University issues forms I-20 (F-1) or DS-2019 (J-1) for the nine-month academic year with the submission of Old Dominion University's Financial Affidavit of Support, along with any corresponding original, bank issued financial statements or financial sponsorship guarantees.

English Proficiency Requirements for Non-Native Speakers of English

Admission to the University is contingent upon successful completion of English language proficiency requirements. Non-native speakers of English can provide evidence of English language proficiency through a variety of options. Bridge Program students, undergraduate and graduate, must satisfy English proficiency requirements within twelve months from their enrollment in the program. Admission to the English Language Center (ELC) and subsequent enrollment in non-credit English language courses at the ELC does not imply University admission or course credit.

Graduate applicants who are non-native speakers of English must provide evidence of English language proficiency through fulfillment of one of the following:

1. Submission of one of the following English proficiency test scores: TOEFL iBT of 79 (550 paper based); IELTS overall band of 6.5; GRE Verbal Reasoning of 152, a GCSE or GCE score of "O" level pass in English; CPE grade of A, B, C.
2. Possession of a Bachelor's or Master's degree equivalent from an accredited institution located in a country where English is the native language.
3. Successful completion of two university- or college-level English courses at a regionally accredited U.S. institution. Successful completion is defined as obtaining a minimum grade of C (2.00) in each of these courses. These courses must be equivalent to the University's English composition course(s) (see General Education Requirements, Lower-Division Written Communication section) and any other advanced composition or technical writing course. In addition, matriculated Old Dominion University / English Language Center students must receive prior approval from the Office of International Admissions to take English composition courses at another institution for the purpose of satisfying the English Proficiency Requirement.
4. Successful completion of the Graduate Bridge Program.

Graduate students who choose to satisfy English language proficiency requirements through the on-campus English Language Center will be placed according to the following criteria:

1. Students with a TOEFL iBT score below 61 (below 500 paper-based) will be placed in the Full-time, intensive English language program.
2. Students with a TOEFL iBT score falling between 61-78 (paper-based score of 500, but below 550) will be placed in the comprehensive Graduate Bridge Program, to include academic course work (one graduate course) and semi-intensive English language courses (seven hours). Students will be considered as having satisfied English language requirements when they have successfully completed two semesters in this program. Attendance in the seven-week Summer Graduate Bridge Program can count as one semester. Successful completion is defined as a minimum grade of B in both each graduate academic course and English language course. No student will receive a grade of A or B in an English language course without demonstrating 85% attendance.

Also, non-native speakers of English who anticipate holding a teaching assistantship position must provide evidence of oral English proficiency. They may take the Test of Spoken English (TSE), given by the Educational Testing Service (ETS) at sites around the world, or the ETS SPEAK Test, administered by the English Language Center at Old Dominion University. Graduate teaching assistants who fail to pass either of these tests will not be eligible to assume an instructional position.

Distance Learning

The mission of the Office of Admissions is to recruit, admit and enroll students from throughout the United States and abroad who will contribute to the overall collegiate experience. Old Dominion University is open to all qualified students regardless of race, color, religion, sex (including pregnancy), age, national origin, veteran status, disability, political affiliation, sexual orientation or genetic information.

Admission

Students who are applying for a distance learning program are encouraged to apply on-line and include their essay and resume. Students may request letters of recommendation within the on-line application and the recommendation letters can either be mailed or sent electronically to the Office of Admissions. Paper applications are available and may be submitted to the local Distance Learning location or mailed to the Office of Admissions. All graduate applications are processed according to the University policies and procedures contained in this catalog.

Types of Admission Status

Degree Seeking Applicants

Regular

Students who have fully met the requirements for admission to a program.

Provisional

An applicant who does not fully meet the requirements for admission as a regular graduate student may, at the discretion of the graduate program director, be allowed to enroll in a graduate program as a provisional graduate student. This is normally a temporary status, which will be changed by the graduate program director to that of regular status when the student has fulfilled all the terms and conditions detailed in the offer of provisional admission. The change in status ordinarily will take place after the completion of at least 12 hours of graduate course work in which the student has earned the average grade of B (3.00) or better and upon completion of any prerequisite work. Previous non-degree credits earned may not be included for purposes of satisfying the provisional 12-hour requirement. No student with less than a 3.00 average will be granted regular status. Should a provisionally admitted graduate student not qualify for regular status at this time, the student may request non-degree status. Provisional students placed in non-degree status must reapply for admission to a degree-seeking program. The Regulations for Continuance section of this Catalog applies to both provisional and non-degree students. Credits earned as a provisional student may be applied toward the fulfillment of degree requirements. Credit earned while in non-degree status is subject to the limitations described below for non-degree admission.

Deferred Enrollment

With approval of the graduate program director, enrollment into a graduate program can be deferred for no more than 1 calendar year beyond the start of the original semester for which admission was offered. For example, students offered admission for fall may request to defer their enrollment to the next fall semester. The records of students who have not enrolled after 1 calendar year will be purged and students will have to reapply for admission.

Nondegree Entry

Nondegree entry is available to students who do not choose to apply for admission to a degree program at the time but wish to enroll in course work at the institution. Some reasons to enter as a nondegree student are:

Visiting student – A student who takes course work at Old Dominion University and then transfers the course credit to the home (degree-granting) institution.

Applying for a certificate program.

Expanding academic background or teacher certification.

Taking courses for personal and/or academic growth.

Missed the application deadline, but intends to apply as a degree-seeking student for a successive term.

Taking prerequisites (undergraduate, second degree or graduate) for a degree-seeking program.

Senior scholars – High school students taking college-level courses (permission is needed from an admissions counselor).

Nondegree Entry Procedures

Applicants for nondegree status are required to complete the online application form on the Admissions Office web page. For the student's

convenience, official credentials may not be required at the time of registration; however, unofficial records or a personal interview may be requested for admission purposes. It is understood that all student information stated on the application is truthful. Deliberate falsification of application information will result in immediate withdrawal and a potential forfeiture of credits. Students should be familiar with policies and procedures for nondegree enrollment listed on the application form.

Directions for Certificate Program Registration

Please contact the department offering the certificate program for specific registration information and procedures.

Additional Information

All students should seek the approval of the academic department before registering for course work as a nondegree student.

Financial aid is not available for nondegree students, except those in approved teacher certification programs.

Students under suspension from another college or university are not eligible to attend as nondegree.

Academic advising is not available to nondegree students, but students are strongly encouraged to contact their academic department before registering for courses.

All students, degree and nondegree alike, must meet the continuance requirements as stated in the current Graduate Catalog. Failure to meet these requirements will subject students to probation or suspension.

Continuing Student Admission

Continuing applicants are students who have previously attended Old Dominion University on a degree-seeking basis and left the University, but would like to return. A student who has left the University in good academic standing is required to complete a reactivation/readmission form. If the separation from the University was longer than five years, the applicant will be required to reapply and resubmit all official transcripts and necessary credentials.

Graduate Registration Requirements

Office of the University Registrar

The Office of the University Registrar provides a wide variety of student services, including registration, verification of enrollment, maintenance of student records and academic history, transcripts, degree certification and diplomas. A calendar of important dates, the examination schedule, and information about various policies and procedures is available at <http://www.odu.edu/registrar>.

The Office of the University Registrar also is responsible for determining in-state tuition status, athletic eligibility and registration of students enrolling through the Virginia Tidewater Consortium and the Interinstitutional Study Program with Norfolk State University.

Finally, the Office of the University Registrar provides service to military veterans who are attending the University by processing Veterans Affairs paperwork. Complete information is available to veterans on the Registrar's Office website as well as on the Veterans Administration website <http://www.gibill.va.gov/>.

Self-service is available for most processes online at <https://my.odu.edu>. On the Norfolk campus, walk-up services are available at the office in 116 Alfred B. Rollins, Jr. Hall. Additionally, many services are available at the higher education centers and the distance learning sites located throughout the Commonwealth of Virginia. The office is open Monday-Friday from 8 a.m.-5 p.m. and can be reached at 757-683-4425.

Registration

There are several registration options available to students: registration via the web at <https://my.odu.edu>, via LEO online, in person, on-campus registration, and off-campus registration.

Eligible students are encouraged to preregister in order to improve the likelihood of obtaining satisfactory schedules of classes. Preregistration is reserved for currently enrolled degree-seeking students. Eligible students will be assigned a "time ticket" four to six weeks prior to preregistration. Open registration begins immediately following the preregistration period.

Complete registration information, important deadlines and the final examination schedule can be found at <http://www.odu.edu/registrar>. The course schedule is available at <https://my.odu.edu> or <https://www.leonline.odu.edu/> by March 7 for summer and fall semester classes and by October 7 for spring semester classes.

Academic Calendar and Course Scheduling

The academic calendar consists of fall semester, which begins one week prior to Labor Day Weekend, and ends 16 weeks later. Classes will be held on Saturday and Sunday of Labor Day weekend, but classes are canceled for Labor Day. A Fall Break is scheduled for mid-October (Columbus Day Weekend) and runs from Saturday through Tuesday of that weekend. Thanksgiving break begins after classes on Tuesday prior to the holiday, and classes resume on the following Monday.

Spring semester begins one week prior to the Martin Luther King holiday weekend. Classes are canceled for MLK weekend (Saturday-Monday) and resume on Tuesday following the holiday. Spring Break is scheduled eight weeks after the start of classes, from Monday through Saturday. Classes resume on the following Sunday and continue until Tuesday of week 15 into the semester, with the exception of Easter Sunday. A reading day is held the Wednesday after classes end, with exams beginning on Thursday and continuing to the following Thursday.

Fall and spring commencement ceremonies currently are scheduled for the Friday evening and Saturday after exams have been administered. Complete information is available on the Commencement website. There is one graduation date each fall and spring semester, the Saturday after exams have been administered. This date will be printed on diplomas and transcripts.

The graduation date for students completing studies in the summer will be the Friday before fall classes resume. There is no summer commencement ceremony.

Summer term is 13 weeks, with varying sessions allowing for course durations of one week, two weeks, and so on, up to 13-week timeframes. The term ends no later than mid-August.

Note: Asynchronous courses may or may not follow these terms. The University will determine the duration of each course, and students may opt for self-paced study, based on the concept of anytime/anyplace learning.

Authorization to Enroll in Graduate Courses

Degree Seeking Students

All students who have been admitted in regular or provisional status to graduate degree programs must have the advisor block updated prior to registration each semester. Students should consult with their advisors to discuss their program of study and to schedule appropriate courses in advance of registration whenever possible.

Nondegree Seeking Students

Nondegree graduate students should seek advice from the department/school offering the course, or, if registering for engineering or business courses, obtain permission of the department/school.

All nondegree graduate students who have completed six credit hours of graduate courses will receive an "advisory" notice upon attempting to register for additional graduate courses. This notice will advise the student to contact the Office of Graduate Studies to obtain counseling and recommendations. This "advisory" notice will not prevent registration.

All nondegree graduate students who have completed or will exceed 12 credit hours (13 credit hours for certain military programs) will be blocked from registering attempting to register for additional graduate courses. To remove this registration block, a student must contact the Office of Graduate Studies for advice on gaining admission into a graduate program or to receive written permission to take additional hours as a nondegree student.

Students taking graduate courses for licensure, certification or professional development (e.g., Virginia Department of Education "endorsements") will not receive the advisory notice and will be exempt from the registration block. Contact the department offering the program for specific registration information and procedures.

Students should consult the Registrar's Office website at <http://www.odu.edu/registrar> each semester for the most current advising and registration policies.

Audit Status

The audit grading status is available for students who would like to enroll in a course for the knowledge gained or personal satisfaction, not for academic credit. Any course that is elected to be carried as an audit will be subject to the normal fees and regulations of the University. Regular attendance is expected, but neither tests nor examinations are required. No grade will be recorded, except that an instructor may assign a grade of W& to a student who misses an appreciable portion of the classes. The student's record will be marked "audit" by the course so elected. A student may not audit a course and subsequently seek advanced placement credit for the same course. A student may audit a course and register for the same course for credit in a subsequent semester. Any course elected for audit cannot be changed to that of credit status after the end of the "add" registration period. Registration for the audit option must be selected by the end of the drop/add period in the given semester. Students receiving financial aid should be aware that registering for audit status may affect their financial aid eligibility. Selection of the audit status is accomplished through the normal registration procedures.

Graduate Numbering (Graduate Level)

Courses at the 500, 600, 700, and 800 levels are generally for graduate credit. Courses at the 500 level correspond to undergraduate 400-level courses; however, a different grading scale is used for 500-level registrants. Additional and higher quality work is required in 500-level courses. A limited number of 500-level courses may be used to satisfy the requirements for a master's degree. Courses at the 600 level are the mainstay of master's programs and are not linked to numbers at other levels. A limited number of 600-level courses may be used to satisfy the requirements for a doctoral degree. 700- and 800-level courses are generally, but not always, linked. 700-level courses are generally for advanced master's students, and 800-level courses are generally for doctoral students. Higher level outcomes are required for 800-level courses. At least three-fifths of the coursework for a doctoral degree must be completed at the 800 level. However, some programs have instituted more stringent requirements.

Topics course numbers include 595, 596, 695, 696, 795, 796, 895, and 896. These numbers are generally to be used to designate topics courses taught as a class. The particular topic for that semester should also be listed. If a particular topic is offered more than three times, it should be approved as a regular course offering and given its own course number.

Individual and Tutorial course numbers include 597, 697, 797, and 897. These numbers are generally to be used to designate courses involving individual or tutorial study within a discipline. These individually arranged courses will require prior approval by the department chair and/or instructor.

Cooperative Education course numbers are generally 667, and 867.

Internship course numbers are generally 668, and 868.

Practicum course numbers are generally 669, and 869.

Seminar, Colloquium, and Capstone course numbers include 690, 691, 692, 693, 890, 891, 892 and 893.

Research/Project course numbers are generally 698 for the master's level and 898 for the doctoral level.

The Thesis course number is 699 and is reserved for the master's thesis.

The Dissertation course number is 899 and is reserved for doctoral dissertation courses.

The Continuous Enrollment course number 999 is available for the purpose of maintaining active status at the doctoral level. This may be a discipline-specific 999 course or GRAD 999.

The Continuous Enrollment course number 998 is available for the purpose of maintaining active status at the master's level. This may be a discipline-specific 998 course or GRAD 998.

System of Grading

Grade	Grade Points	Undergraduate	Graduate
A	4.00	Superior	Excellent
A-	3.70	Superior	Excellent
B+	3.30	Good	Good
B	3.00	Good	Good
B-	2.70	Good	Fair
C+	2.30	Satisfactory	Poor
C	2.00	Satisfactory	Poor
C-	1.70	Passing	Poor
D+	1.30	Passing	Not Used
D	1.00	Passing	Not Used
D-	0.70	Passing	Not Used
F	0.00	Failing	Unsatisfactory
WF	0.00	Unofficial Withdrawal	Unofficial Withdrawal
P	None	Pass	See Below
F(P/F)	None	Fail	See Below

O	None	Audit
I	None	Incomplete
II	None	Incomplete not Subject to Time Limit
W	None	Official Withdrawal
Q	None	Progress but not Proficiency
Z	None	No Grade Reported

The use of plus and minus grades is at the discretion of the instructor.

The grade point average is calculated by dividing the accumulated number of grade points earned by the accumulated number of credit hours attempted. Grades of F and WF and repeats are included, but official withdrawals, audits, and grades on noncredit courses, nondegree credit courses, and pass/fail degree courses are not included.

A 3.00 average will be required for the awarding of a graduate degree or certificate. A student whose average falls below 3.00 following six or more graduate hours attempted shall be placed on probation or suspended in accordance with the continuance regulations for graduate students.

Grades in courses accepted for transfer credit are not counted in the computation of grade point averages.

Grades are available to students through the secure website at my.odu.edu. Grades are mailed to students only if a written request is submitted to the Office of the University Registrar.

WF and W Grades

The grades of WF and W indicate withdrawal from a course only under those conditions described in the sections entitled Class Schedule Change Procedure and Grading Policy for Withdrawal From Classes.

Incomplete Grades

A grade of I indicates assigned work yet to be completed in a given course or absence from the final examination and is assigned only upon instructor approval of a student request. The I grade may be awarded only in exceptional circumstances beyond the student's control, such as illness, and only after 80% of the time allocated for the course has elapsed and substantial progress has been made toward completion of course requirements with the exception of courses that do not fit within the traditional semester calendar. In cases of exceptional circumstances beyond the student's control, it is the responsibility of the student to approach the instructor to request an I grade and to provide documentation, including a written statement of when the work will be completed, to support the request. The authority to award an I grade rests with the instructor whose decision is final. Students whose requests for I grades are approved must not re-register for the class until the I grade has been resolved. The I grade becomes an F if not removed through the last day of classes of the following term (excluding the exam period) according to the following schedule: I grades from the fall semester become F's if not removed by the last day of classes of the spring semester; I grades from the spring semester and the summer session become F's if not removed by the last day of classes of the fall semester. An I grade may be changed to a W only in very unusual circumstances and when the student's situation has changed since the I grade was awarded. In these cases, the request for a change to a W must be in writing, documented, and approved by the instructor, department chair and dean. Students will not be allowed to graduate until all grades of I have been resolved.

In the case of courses that do not fit within the traditional semester calendar, the faculty member assigns the I grade. The time periods for the removal of I grades before they become grades of F are the same as those stated in the previous paragraph.

Extension of the I time limitation normally will not be approved except for reasons beyond the student's control and only if the supervising faculty

member is available and willing to supervise the work beyond the normal time limit. Students should submit the request to the instructor, who should submit approval, via the chair, to the University Registrar in order to retain the I. The approval from the instructor should designate the expiration date of the extension.

A grade of II indicates incomplete work not subject to the time limits described above for I grades. The II grade can be used only in those courses directly related to the research for and preparation of the graduate thesis/dissertation.

Z Grades

A grade of Z indicates that no grade has been reported by the instructor and will convert to a grade of F if not removed through the last day of classes of the following term (excluding the exam period) according to the following schedule: Z grades from the fall semester become F's if not removed by the last day of classes of the spring semester; Z grades from the spring semester and the summer session become F's if not removed by the last day of classes of the fall semester. Students will not be allowed to graduate until all grades of Z have been resolved.

Mid-Semester Feedback

The University believes that regular assessment of students and feedback to them is essential to effective teaching and learning. Therefore, faculty members will provide all students with evaluation of their progress in a course prior to midsemester (or equivalent in a nonsemester course) so that students have information about their progress before the withdrawal deadline, which is the end of the tenth week of classes.

Dropping, Adding and Withdrawing From Classes

See the academic calendar in this Catalog or the Registrar's Office website at <http://www.odu.edu/registrar> for deadlines for adding or dropping classes. For information regarding the refund schedule, see the chapter on Financial Information or go to the Office of Finance's web page at <http://ww2.odu.edu/af/finance/>.

Class Schedule Changes and Drop/Add Procedures

During the fall and spring semesters, students may drop classes within the first 11 calendar days after the first day of classes for the semester and may add classes up to 11 calendar days after the first day of classes for the semester (for full semester classes).

Once registered, a student must drop or add classes via the secure website at <https://my.odu.edu>, via LEO online or submit a completed drop/add form to the Office of the University Registrar or to the distance site office (for distance students). The date the form is received in the Office of the University Registrar, the distance site office or processed via LEO determines tuition adjustments, if applicable. If needed, drop/add forms can be downloaded from the Registrar's Office website: <http://www.odu.edu/registrar>.

Students enrolled in degree programs in which sequencing is critical are urged to consult their academic advisors before scheduling changes. In such programs, dropping of courses without prior consultation with academic advisors may necessitate additional time to complete University and/or departmental degree requirements.

See the academic calendar in this Catalog or <http://www.odu.edu/registrar> and click on the link to "calendars" for the dates for adding or dropping classes. For information regarding the refund schedule, see the chapter on Tuition, Fees and Financial Information or go to the Office of Finance's web page (<http://ww2.odu.edu/af/finance/>).

Summer Sessions

Old Dominion University offers a 13-week summer program, including two six-and-one-half week sessions, two five-week sessions, and one 13-week session, starting in the middle of May and ending in the middle of

August. The exact dates are listed on the Registrar's Office website at <http://www.odu.edu/registrar>. More than 1,500 graduate and undergraduate classes are offered on campus and off campus during the summer months.

Withdrawal From Classes or From the University Policy for Dropping and Withdrawing From Classes Dropping Classes

Prior to the start of and during the first eleven calendar days of the semester, a student may drop a course; this means no grade will be assigned and no reference entered on the student's permanent academic record. Please refer to <http://www.odu.edu/registrar> and click on the link to "calendars" for the dates to drop classes in nonsemester courses.

Withdrawal from Classes

After the first eleven calendar days of the semester, a student may withdraw from any course through the end of the tenth week of a regular semester. Please refer to <http://www.odu.edu/registrar> and click on the link to "calendars" for the dates to withdraw from classes in nonsemester courses. A grade of W will be assigned during this period. Students who withdraw through the end of the tenth week are encouraged to contact their instructor, advisor, site director, or distance learning representative, and financial aid counselor to discuss the implications of withdrawing. Students receiving financial aid may not meet Satisfactory Academic Progress (SAP) requirements if withdrawing from a course or courses during the semester.

Withdrawal from a course after the tenth week of a regular session (or its equivalent in a nonsemester course) is usually not permitted. However, in the event of an illness or other severe hardship beyond the student's control, the student should submit, no later than the last day of classes, a written petition for permission to withdraw to the instructor and the chair of the department offering the course. If permission is granted by both, a grade of W will be recorded. If permission is not granted by both, the student will not be allowed to withdraw from the course. Any appeal of decisions should be brought to the dean of the college offering the course.

A student who stops attending classes without withdrawing from the course will receive a grade of WF, except if the student's performance was an F at the time the student stopped attending class, in which case a grade of F will be assigned. The grade of WF will carry no grade points, and will be computed in the grade point average as a grade of F.

Drop and Withdrawal Deadlines

Specific deadline dates for dropping and withdrawing from classes are found at the Registrar's Office website, <http://www.odu.edu/registrar>, by clicking on the link to "calendars"

Administrative Withdrawal From the University

During the course of any semester, there will be situations, such as severe illness, death in the immediate family, or disciplinary actions, which will require that the University initiate an administrative withdrawal from the University to assist a student or to implement a University-imposed sanction. The following procedures will be used.

1. The request for withdrawal is initiated either by the student because of an extenuating personal situation or by the University because of a disciplinary situation.
2. This action will normally be handled by Student Ombudsperson Services. If the student initiates the withdrawal, Student Ombudsperson Services will determine what verification is necessary and document the situation.
3. A request will be submitted to the Office of the University Registrar to withdraw the student from all classes.
4. The student's instructors will be notified. If the student is withdrawing after the last day to withdraw from classes without penalty, part of this notification will include the opportunity for the faculty member to raise objections if the student's classroom performance is such that a withdrawal (W) would not be appropriate. If a faculty member objects,

the faculty member will inform the University Registrar and the student will receive an “F” in the class.

5. The request for withdrawal must be initiated by the student within one calendar year counting from the first day of classes of the term for which administrative withdrawal is sought. Requests for withdrawal that have the necessary documentation but are received after the one-year deadline may be reviewed by an appeals committee consisting of at least three members and including both faculty and administrators, to be convened by the Student Ombudsperson in Student Engagement and Enrollment Services. These requests must include clear and convincing evidence explaining the student’s inability to submit the request within one calendar year.
6. Tuition refund appeals are handled separately and must be submitted to the Office of Finance. Students submitting requests after the one-year deadline are not eligible for a tuition appeal.
7. Students receiving financial aid should consult their financial aid counselor prior to submitting a tuition refund appeal.

Sudden Withdrawal and Prolonged Absence Due to Military Mobilization

The following guidelines are provided for students whose service in the uniformed services has required their sudden withdrawal or prolonged absence from enrollment at Old Dominion University.

The following definitions are provided in connection with these guidelines:

- “Service in the uniformed services” means service (whether voluntary or involuntary) on active duty in the Armed Forces, including such service by a member of the National Guard or Reserve, for a period of more than 30 days under call or order to active duty of more than 30 days.
- “Tuition” means the actual price of education charged to a student for the term in which service in the uniformed services caused his or her sudden withdrawal or prolonged absence from enrollment at a Virginia institution of higher education.
- “Reinstatement” means the readmittance and reenrollment of a student whose service in the uniformed services has caused his or her sudden withdrawal or prolonged absence from enrollment.
- “Sudden withdrawal” means leaving an institution after a semester has begun or after the tuition and required fees for a term have already been billed to or paid by the student.

Policies and Procedures

All active duty military students who are unable to complete course requirements due to change in employment duties, work schedule or deployment to a duty assignment may be administratively withdrawn from current semester courses. Students are required to furnish a copy of their military orders to the Office of the University Registrar. Upon receipt of the copy of military orders, the student will be withdrawn from all courses and refund of tuition will be processed following an audit of the student’s account and returned to the appropriate party. In addition, the University Registrar will notify the following offices so that additional refunds can be processed as appropriate: Housing and Residence Life, University Card Center, Parking Services, and Old Dominion University Bookstore. Students who are deployed while actively attending the University should make an effort to notify the University Registrar as soon as possible so that records can be updated, providing a copy of military orders or verification of a new duty assignment.

University Housing and Dining Services

Upon notification by the University Registrar, the Executive Director of Office of Housing and Residence Life will authorize a refund based on prorated charges for the semester calculated on the days in residence. If the student is deployed prior to the start of the semester, but has made a formal commitment for University housing, the student will be released from the housing agreement without penalty and the deposit will be fully refunded.

Dining/Monarch Plus Card/Parking Services

Upon notification by the University Registrar, prorated refunds will be made for partially used meal plans. Funds remaining on the Monarch Plus card

will be refunded to the student. Refund of payment for a parking decal will be prorated based on percentage of use.

Textbooks

Upon notification by the University Registrar, the Old Dominion University Bookstore will allow for full refunds/and or exchanges of textbooks for any student called to official active military duty as long as the book is in resaleable condition.

Preview Fee

Students who have paid but have not attended Preview will receive full refund of the fee.

Academic Credit

If the student has begun attending classes and sufficient time has passed in the semester, the incomplete grade policy may apply.

A grade of Incomplete (I) indicates assigned work yet to be completed in a given course or absence from the final examination and is assigned only upon instructor approval of a student’s request. The I grade may be awarded only in exceptional circumstances beyond the student’s control, such as illness, and only after 80% of the time allocated for the course has elapsed and substantial progress has been made toward completion of course requirements with the exception of courses that do not fit within the traditional semester calendar. In cases of exceptional circumstances beyond the student’s control, it is the responsibility of the student to approach the instructor to request an I grade and to provide documentation, including a written statement of when the work will be completed, to support the request. The authority to award an I grade rests with the instructor whose decision is final. Students whose requests for I grades are approved must not re-register for the class until the I grade has been resolved. The I grade becomes an F if not removed through the last day of classes of the following term (excluding the exam period) according to the following schedule: I grades from the fall semester become F’s if not removed by the last day of classes of the spring semester; I grades from the spring semester and the summer session become F’s if not removed by the last day of classes of the fall semester. An I grade may be changed to a W only in very unusual circumstances and when the student’s situation has changed since the I grade was awarded. In these cases, the request for a change to a W must be in writing, documented, and approved by the instructor, department chair and dean. Students will not be allowed to graduate until all grades of I have been resolved.

In the case of courses that do not fit within the traditional semester calendar, the faculty member assigns the I grade. The time periods for the removal of I grades before they become grades of F are the same as those stated in the previous paragraph.

Extension of the I time limitation normally will not be approved except for reasons beyond the student’s control and only if the supervising faculty member is available and willing to supervise the work beyond the normal time limit. Students should submit the request to the instructor, who should submit approval, via the chair, to the University Registrar in order to retain the I. The approval from the instructor should designate the expiration date of the extension.

If the student is unable to complete the incomplete grade because of prolonged deployment the student should provide justification and documentation directly to the course instructor. At the instructor’s discretion, the course instructor can authorize the University Registrar to administratively withdraw the student using this policy. The student will be withdrawn from the course, a grade W will be posted to the academic record and refund of tuition to the appropriate party will be processed. If the instructor is no longer employed at the University, the student should consult the department chair. In the event of a disagreement about a grade, the normal grade appeal process described in the University Catalogs will apply.

Students who are administratively withdrawn from the University under this policy are strongly encouraged to maintain contact with the University through the Office of Student Engagement and Enrollment Services.

Students who are called to active duty during an academic semester who have completed 75 percent of the course requirements at the time of activation and who meet other specified requirements also have the option to accept the grade earned to date. It is the responsibility of the student to provide a copy of the military orders to the Office of the University Registrar. The Registrar will provide documentation to the instructor in support of the student's request to receive the grade earned to date.

Reinstatement

As soon as plans are made, returning students should contact the Office of Admissions to verify their student status and to reactivate their record, if necessary, prior to re-enrolling in classes. Students who leave the University in good standing remain eligible to re-enroll. A student who has left the University for more than a year must complete a reactivation/readmission form available on the Office of Admissions web site. If the separation from the University was longer than five years, the applicant will need to resubmit all official transcripts and necessary credentials. There are no additional fees if the student has previously paid the admission fee.

Students who return following a prolonged absence due to military deployment should be aware of the time limits for Catalog election.

Graduate Return to Program

It is presumed the graduate student will remain eligible to return to the same program of study. The student should contact the Graduate Program Director if returning to the same program of study. The content of some programs may require that the student repeat previously passed courses to maintain currency in the field.

If the program of study is no longer available for any reason, the student should seek the assistance from the Graduate Program Director of the appropriate alternative major.

Graduate Time Limits

Graduate students may choose to graduate under the Catalog in effect at the time of their first enrollment (part-time or full-time) or any subsequent Catalog provided that the students graduate within six years (master's) or eight years (doctoral) from the date of the first enrollment. Students who have prolonged deployment may be required to elect a more recent Catalog or the Catalog in effect at the term of re-enrollment at the University. Returning students should consult their Graduate Program Director to verify the correct Catalog for graduation purposes. Students should refer to their "general student record" in Leo Online to verify the Catalog selected at the date of first enrollment. The Catalog "year" begins with the fall semester each year.

In all cases, students must have been duly admitted to the University and an academic program of study and meet all of the requirements for graduation in one Catalog. Students may not "tailor make" their own degree requirements by selecting partial requirements from more than one Catalog.

The Office of the University Registrar will maintain records of administrative withdrawals completed under this policy.

Guidelines and Procedures for Grade Adjustments for Nonacademic Reasons

1. Errors in the assignment of grades (e.g., a C received instead of an A) must be brought to the attention of the faculty member immediately upon receipt of the grade. If confirmed, the instructor will submit a grade change through the chair to the University Registrar. An online process for grade changes is available if the grade to be changed is not older than two semesters. In these cases, the instructor of record makes the change online. The chair is notified by email of the change and may at that time deny the change of grade. If the grade to be changed is older than two semesters, then the instructor submits an Academic Record Change Form (H-1002) to the chair, who forwards it to the University Registrar if it is approved, and notifies the instructor of reasons for denial if it is not approved.

2. Administrative errors (e.g., drop/add submitted but not processed) should be brought to the attention of the University Registrar immediately upon receipt of the grade.

Grade Appeal Procedure

1. The purpose of the grade appeal procedure is to serve the needs of graduate and undergraduate students who believe that they were unjustly awarded a final course grade by a faculty member through prejudice or caprice. This policy applies to the final grade for the award of academic credit and does not apply to graduate and undergraduate examinations that are administered as part of the degree progression and certification processes (such as comprehensive examinations and candidacy examinations at the graduate level). The basis for a grade appeal is the student's charge that the final grade was awarded through prejudice or caprice. The burden of proof rests with the student.
2. Students must initiate the appeal within the same time limitations that exist for removing a grade of I from a record (see the policy on System of Grading).
3. The student will consult with the instructor first for an explanation of the method of evaluation and to determine whether an error has been made.
4. If the student is not satisfied with the results of the conference with the instructor and the student wishes to pursue the appeal, the case must be presented in writing for a first-level appeal. The student's grade appeal letter should (1) state specific reasons and give examples of faculty prejudice or caprice, (2) show that prejudice or caprice affected the awarding of the final course grade, and (3) be presented as a complete package and include all supporting documentation.
 - a. The student will submit the grade appeal letter to the chair of the department.
 - b. If the instructor is the chair, the student will submit the grade appeal letter to the dean.
 - c. If the instructor is the dean, the student will submit the grade appeal letter to the chair of the department in which the dean is teaching the course.
5. If it is concluded at the first-level appeal that there is no cause for complaint, the person to whom the appeal was submitted will notify the student in writing that the appeal is denied. The student may submit a second-level appeal as detailed below.
 - a. If the chair initially concludes in the first-level appeal that there is no cause for complaint, the student has the right to appeal to the dean. The student should request in writing that the chair forward the grade appeal package to the dean to initiate the second-level appeal.
 - b. If the instructor is the chair and the student has appealed directly to the dean and the dean concludes in the first-level appeal that there is no cause for complaint, the student has the right to appeal to the provost and vice president for academic affairs. The student should request in writing that the dean forward the grade appeal package to the provost and vice president for academic affairs to initiate the second-level appeal.
 - c. If the instructor is the dean and the student has appealed to the chair of the department in which the dean is teaching the course and the chair has concluded in the first-level appeal that there is no cause for complaint, the student has the right to appeal to the provost and vice president for academic affairs. The student should request in writing that the chair forward the grade appeal package to the provost and vice president for academic affairs to initiate the second-level appeal.
6. If the person to whom the second-level appeal is submitted concludes that there is no cause for complaint, the student will be notified in writing that the grade appeal process is complete and no further appeal is allowed.
7. If during the first- or second-level appeal process it is concluded that there may be valid cause for the complaint, the person to whom the appeal has been submitted should consult with the instructor and student and attempt to mediate the dispute. Among the alternatives available for resolution of the case will be the assignment of the grade of P if the chair, the instructor, and the student express their agreement in writing.

If mediation fails, the person to whom the appeal has been submitted will offer to form a committee to carry out an independent investigation and a hearing will be held.

- a. The person to whom the appeal has been submitted will appoint a committee from the department or college. The committee will consist of two faculty and one student. Both the instructor and the student will have the right to challenge, for valid cause, any or all of the members of the committee, and in that event replacements will be appointed and no further challenge will be permitted. The committee will hear the instructor, the student, and other pertinent witnesses. The hearing will be taped, but the tapes will be erased after one year following disposition of the case. The committee, after careful deliberation, will make its recommendation to the person to whom the appeal was submitted, who will relay the information to the instructor and the student.
- b. If the committee finds that there is no cause for complaint, the grade appeal process is complete and no further appeal on the merits of the case is allowed. Only one hearing on the merits of the case is allowed.
- c. If the committee finds on behalf of the student and recommends a change of grade and the instructor refuses to change the grade, then the person to whom the appeal was submitted will consult with the student about the advisability of accepting a P grade. Should the student consent to acceptance of a P grade, the person to whom the appeal was submitted is authorized to change the contested grade and will so inform the registrar. A P grade established under this policy will be given irrespective of the University policy on hours permitted for P grades or restrictions on when a P grade is permissible and will not prevent progression in the degree program or courses for which this course is a prerequisite.
- d. If either the instructor or the student believes that the established procedures for the appeal of grades have not been followed, an appeal for a rehearing may be to the person identified as the second level of appeal. The only basis for appeal will be the failure to have been provided due process as prescribed by the policy.

Transcripts

Transcripts are provided by the Office of the University Registrar and are issued only upon the written request of the student or upon submission through the secure website at my.odu.edu, click on the link to Leo Online (click on link to student records and then transcripts). They should be requested at least five business days before the date needed to allow for processing and delivery. Students picking up transcripts must present valid identification.

No transcripts will be issued if the student has an outstanding debt at the University. All grades, academic standing, degrees received, and degree honors are included on the transcript.

An official transcript carries the University Seal and an authorized signature. Official transcripts are usually mailed directly to educational institutions, employers, etc. Any transcript mailed to or given directly to a student will be marked, "Issued to Student." Partial transcripts are not issued; each transcript must include the student's complete record at Old Dominion University. A transcript of work completed at any high school or at any college other than Old Dominion University must be obtained directly from that institution.

There is a charge of \$5.00 for each transcript issued. Additional fees are charged for expedited delivery services. Students may access and print unofficial transcripts for personal use through <https://my.odu.edu>, click LEO online or <https://www.leonline.odu.edu/> at no charge.

Graduation Information

All students must apply for graduation during the semester prior to the expected completion of degree requirements. The deadline to file the intent to graduate is generally the last day of November, February and June for the following semester. Specific deadlines are published on the Registrar's Office website, <http://www.odu.edu/registrar>.

Students can view their application and degree status in LEO Online, via <https://my.odu.edu>. Once the application has been processed, the student's graduation status appears as "pending." The status changes to "awarded" once the degree is conferred. At peak times, coding can take up to four weeks following submission of the application.

Applications, complete instructions and deadlines regarding graduation are available on the Registrar's Office website at <http://www.odu.edu/registrar>. A separate application for each degree is required if the student is pursuing more than one degree.

Students who do not complete degree requirements as expected must reapply for the next graduation date.

Application for Graduation for Graduate Students

Graduate students should apply online at <https://my.odu.edu> or download the application for graduation from the Registrar's Office website and submit the completed paperwork directly to the Registrar's Office. Graduation staff members will coordinate the evaluation process with the appropriate graduate program advisor.

All outstanding work, incomplete and unreported grades must be completed or resolved before the degree will be conferred. Master's level and doctoral students must have submitted the thesis (if required) or dissertation to the Registrar's Office no later than the Friday one week before commencement as well as evidence of successful completion of oral, written or other degree requirements. Graduate students should confer with the graduate program director and review materials available on the Office of Graduate Studies website for complete information (<http://www.odu.edu/graduatestudies>).

Commencement

Commencement exercises are intended for students who are eligible and reasonably expect to complete degree requirements, graduating from the University within the current or next graduation period.

Commencement ceremonies are managed through the Office of University Events. Information about requirements for participation in commencement ceremonies, the on-line application process for tickets, academic regalia, schedule of events, etc., will be posted to <http://www.odu.edu/academics/graduation-commencement>. To be eligible to participate in ceremonies, candidates must register for commencement ceremonies according to deadlines posted by the Office of University Events.

Participation in May commencement ceremonies is limited to candidates for May graduation and students who expect to complete studies in the upcoming August. Participation in December commencement ceremonies is limited to candidates for December graduation and graduates from the preceding August.

Students who expect to attend commencement ceremonies must have applied for graduation by the established deadline and be considered "pending" for graduation; otherwise, tickets will not be provided by the Commencement Office. With the exception of doctoral candidates, all students participating in commencement ceremonies remain pending for graduation until the record is evaluated and the degree is conferred, up to four weeks, excluding University holidays, following the date of the commencement ceremony.

Participation in commencement ceremonies does not confirm that a degree has been (or will be) conferred.

Diplomas

Diplomas are mailed to the student's permanent address after the degree has been posted. Diplomas will be mailed beginning in June for May graduates, in September for August graduates, and in January for December graduates. Diplomas will be mailed as students are cleared for graduation; Registrar's Office staff will continue until all diplomas are distributed. Students can verify posting of degrees and other information at <https://www.leonline.odu.edu/>.

All holds, debts or other obligations to the University must be satisfied before the diploma will be released. Information about holds can be viewed at <https://www.leonline.odu.edu/>.

The student's legal name (as maintained in the student system) and the degree title (Master of Arts, Master of Sciences, etc.) appear on the diploma. For a complete listing of degrees, please refer to the "Graduate Degree and Post-Baccalaureate Certificate Programs" listing in this catalog. The student's major does not appear on the diploma, but is published on the transcript.

Interinstitutional Agreements and Opportunities to Fulfill the Degree

Attendance at Other Institutions

Graduate students who are enrolled at Old Dominion University may attend another institution and transfer credit earned to a degree program at Old Dominion University. While formal Old Dominion University permission is not required, students should consult the graduate program advisor to ensure that the credits to be taken at the other institution will transfer to the Old Dominion University program in which the student is enrolled. An official transcript from the other institution must be submitted to the graduate program advisor along with any supporting materials that may be requested such as a syllabus, course description, etc. The graduate program advisor will complete an evaluation of external credits and submit the result to the Office of the University Registrar for posting to the student's academic record.

The other institution may ask the student to provide documentation of good standing or eligibility to continue at Old Dominion. These forms should be submitted to the Office of the University Registrar. Forms that require the student to demonstrate that the course(s) will be accepted for transfer credit at Old Dominion University should be submitted directly to the academic advisor.

Academic Common Market

Old Dominion University, through a number of its undergraduate and graduate programs, participates in the Southern Regional Education Board's Academic Common Market. Eligible residents of participating states may enroll (following admission to degree status) as Academic Common Market students at in-state tuition rates. Evidence of legal domicile must be presented to the Office of the University Registrar, 116 Rollins Hall. Information on available programs can be viewed at <http://www.schev.edu/students/acmvainstable.asp>.

Interinstitutional Study Program with Norfolk State University

Old Dominion University students have the opportunity to elect courses at Norfolk State University through a student exchange program agreed to by the two institutions.

The registrar of each institution will register a student for courses at the other institution if the student presents a properly signed form listing the course or courses to be taken at the other institution. The student exchange will be honored both in the regular session and in the summer session and applies to both undergraduate and graduate students. All credits earned by students will be considered as resident credit at the home institution for degree purposes. (Courses taken at NSU under this policy will be considered the same as Old Dominion University courses; all other courses are subject to transfer credit policy limitations.)

Regular bus service is provided between campuses but is not available for evening classes.

Student Exchange Policy Between the College of William and Mary and Old Dominion University

The registrars at Old Dominion University and the College of William and Mary will each register students in all departments in the College of Sciences (Old Dominion) and the School of Marine Science (William and Mary) for courses at the other institution. If the student presents a properly signed form listing the course(s) to be taken at the other institution, the exchange will be honored in both regular sessions and in summer sessions,

and will apply to graduate students at the master's, certificate of advanced study, and doctoral levels at both institutions.

The student must have completed prerequisites for the course(s) for which he/she registers. Core curriculum requirements must be met at the home institution. Elective courses and departmental requirements may be satisfied through exchange courses, but approval is required from the student's department. If a particular course is offered at the home institution, it may not be taken for credit at the other institution. All credits earned will be considered as resident credit at the home institution for degree purposes.

The tuition and fees are determined and retained by the student's home institution.

Student Exchange Policy Between Eastern Virginia Medical School and Old Dominion University

The registrars of Old Dominion University and Eastern Virginia Medical School (EVMS) will each register a student for courses at the other institution if the student presents a properly signed form listing the course(s) to be taken at the other institution. The exchange will be honored both in regular sessions and in summer sessions and will apply to graduate students at the master's and doctoral levels at both institutions. The students must have completed all prerequisites of the courses for which they register. All credit so earned will be considered as resident credit at the home institution for degree purposes. (Courses taken at EVMS under this policy will be considered the same as Old Dominion University courses; all other courses are subject to transfer credit policy limitations.)

Tuition and fees applicable to the courses taken will be handled according to current interinstitutional policies regulating these.

Navy Education Consortium and Educational Agreements

A consortium of higher education institutions, located near major naval facilities, has developed a means to enhance the opportunities for active duty naval officers to participate in graduate education at the master's level. The institutions are Old Dominion University, George Washington University, Memphis State University, The University of Rhode Island, San Diego State University and the University of West Florida. The program areas which may be offered under the auspices of the consortium include international and political studies, computer information sciences, and computer science. These higher education institutions also provide a common curriculum that satisfies competency areas as set forth by the Navy for the ETMS program. Officers participating in the program are enrolled in the Master of Science in Education degree program with a major in educational administration. For current information, contact the Office of Academic Affairs.

Virginia Tidewater Consortium Exchange Program

Old Dominion University students may also take courses at any of the following Consortium institutions: Christopher Newport University (Newport News), College of William and Mary (Williamsburg), Eastern Shore Community College (Melfa), Eastern Virginia Medical School (Norfolk), Hampton University (Hampton), Joint Forces Staff College (Norfolk), Norfolk State University, Paul D. Camp Community College (Franklin), Regent University (Virginia Beach), Thomas Nelson Community College (Hampton), Tidewater Community College (all campuses), and Virginia Wesleyan College (Norfolk).

Cross-registration is subject to the following regulations:

1. Cross-registration is limited to degree-seeking students with cumulative grade point averages of 3.00 or better.
2. Graduate students who opt to cross-register under the Virginia Tidewater Exchange Program may accumulate a maximum of 12 external credit hours to include any combination of transfer or consortium credit hours. Exceptions are granted to students enrolled in approved joint programs within the Virginia Consortium.
3. Graduate students must get pre-approval from their Graduate Program Director (GPD) before registering for consortium classes.

For further information, contact the Office of the University Registrar,
Alfred B. Rollins Jr. Hall.

Tuition Fees & Financial Information

Tuition

As used by the University, the term tuition refers to a comprehensive fee that includes payment of instructional programs, academic services, student services and activities, recreational sports, and intercollegiate athletics. All fees are subject to approval and/or change by the Board of Visitors.

Information related to the comprehensive tuition can be found on the website for the Office of Finance at <http://www.odu.edu/admission/costs-tuition/tuition/tuition-rates>

Students who are eligible to enroll in a combination of undergraduate and graduate courses in any given semester must pay tuition for the courses at the appropriate levels as prescribed. Graduate hours are available at graduate tuition rates, and undergraduate rates apply for undergraduate hours.

Housing Charges—2014-15 Academic Year*

Housing Charges	2014-15 Academic Year
Average room and board per year	\$9,268.00

Applied Music Fees—2014-15 Academic Year*

Applied Music Fees	2014-15 Academic Year
Individual Instruction (2 or 3 credits, one hour of instruction)	\$250.00
Individual Instruction (1 credit, one-half hour of instruction)	\$175.00
Group Instruction (class piano or voice)	\$75.00

Laboratory Fees—2014-15 Academic Year*

Laboratory Fees	2014-15 Academic Year
ARTS 202, 203, 211, 231, 271, 279, 304	\$30
ARTS 241, 251, 252, 253, 254, 261, 263, 281, 291	\$50
BIOL 111N, 118N, 122N, 124N, 137N, 139N	\$20
BIOL 404, 405W, 420, 473, 504, 520, 573	\$25
BIOL 103	\$30
BIOL 250, 251	\$35
BIOL 314	\$40
BIOL 315	\$45
CEE 335	\$20
CET 345W	\$30
CHEM 106N, 108N, 122N, 124N, 138N	\$50
CHEM 212, 214, 322, 332W, 334W	\$75
CHEM 442W/542	\$100
CS 101, 120G, 121G	\$30
CS 150	\$40
CYTO 428	\$45
DNTH 303	\$40
DNTH 301, 317	\$50
ECE 287, 387	\$25
ECE 407, 507	\$30
EET 125, 315, 325, 335	\$30

ENGN 110, 111	\$45
GEOG 402, 404, 502, 504	\$25
MATH 211, 212, 312	\$10
MAE 203, 225, 305	\$25
MAE 441	\$30
MDTS 401, 501, 601	\$45
MEDT 310, 312, 319, 320, 325, 326, 327, 331	\$45
MEDT 307	\$50
MET 387	\$20
MET 200, 400, 415	\$30
NURS 302	\$65
NURS 351	\$80
NURS 619, 658, 659, 660, 665, 674, 675, 764, 767	\$250
NURS 672	\$340
OEAS 106N, 107N, 126N, 127N	\$20
OEAS 110N, 111N, 112N	\$30
OEAS 440, 441, 442W	\$35
PHYS 103N, 104N, 111N, 112N, 126N, 127N, 226N, 227N, 231N, 232N	\$30
PT 627, 628, 826, 827	\$150
STEM 110T, 221, 231, 241, 350, 360	\$20
THEA/COMM 341, 370, 380, 385, 446, 483, 486	\$25

Nonrecurring Charges and Fees—2014-15 Academic Year*

Nonrecurring Charges and Fees	2014-15 Academic Year**
Application Fee**	\$50
Distance Learning On-Line Technology Fee	\$20 per credit hour
Late Penalty Fee	5% of past due amount
Payment Plan Processing Fee (non-refundable)	\$40
Returned Check Processing Charge	\$50
Collection Fees	25% of past due amount
Transcript Processing Charge (per copy)	\$5
Thesis, Dissertation Binding Service Charge	\$50
Additional Copies	\$16.50
Ph.D. Dissertation - Microfilming	\$65
Ph.D. Dissertation - Copyrighting	\$65

* All fees are tentative and subject to final approval by the Board of Visitors and/or the President. Those listed are in effect as of 2014-15 and are subject to change.

** Does not apply to Old Dominion University full-time faculty and staff and their full-time dependents and former Old Dominion University students seeking readmission who have not attended another institution since leaving Old Dominion.

Residency

To be considered a Virginia resident for tuition purposes for any given semester, it is necessary that the applicant be domiciled in the Commonwealth of Virginia for at least one year immediately preceding the beginning of that term. Domicile is a technical legal concept and is defined as the place (state) where a person resides with the unqualified intention of remaining indefinitely, with no present intention of leaving. Domicile is generally evidenced by such things as payment of income, real estate,

and personal property taxes, voter and automobile registration, and driver's license. Residence in Virginia for the purpose of securing an education does not qualify a person for classification as a Virginia student for tuition purposes.

The General Assembly of Virginia has enacted several special provisions for active duty military, spouses and dependents. Please refer to www.odu.edu/registrar for current guidelines.

A student who meets the criteria for resident tuition during his or her course of study at Old Dominion University is not automatically reclassified to such status. He or she must request such classification, using an appeal form available from the Office of the University Registrar. By law, appeals of classifications must be submitted before the start of classes for the term in which a change is sought. Copies of the Virginia statute and guidelines issued by the State Council of Higher Education for Virginia are on reserve in the University Library and are available at www.schev.edu (<http://www.schev.edu>) (search for "domicile"). Because of the length of those requirements, they are not printed in this catalog. Additional information may be obtained from the Office of the University Registrar.

Students who fail to complete the Application for Instate Tuition are classified at the out-of-state tuition rate.

Student residency records may be audited for compliance with the Code of Virginia residency. Students may be required to submit proof of domicile following audit. Documentation may include driver's license, motor vehicle registration, etc.

Billing Cycle

Through the act of registration, either by registering online or by registration form, students accept responsibility for charges incurred. All University charges are due and payable by the established deadlines. The total amount due must be received by 5:00 p.m. on the deadline date shown on the statement to avoid financial penalties. Students unable to pay the total due may opt for participation in the University payment plan (fall and spring only). If charges remain unpaid 30 days after the due date, a 5% late payment penalty is assessed. Once the account is 120 days past due, it is forwarded to a collection agency and assessed an additional 25%.

Billing Statements

The University sends student account and debt notifications by e-mail. It is the student's responsibility to activate the ODU.EDU e-mail address issued to all admitted students. Please refer to Leo Online for specific types of notification covered. Approximately 30 days before the payment due date, advance billing statements for tuition and fees are sent to students who have preregistered. Students are expected to access account information through the secured access site on the web at www.leonline.odu.edu. Any student who registers or adds classes after any advance billing may be issued a statement by electronic mail during the next billing cycle, and charges will be subject to late payment fees. Failure to receive a reminder bill confirming charges does not waive the requirement to make payment when due, and financial penalties may accrue.

Failure to Pay Tuition

Students' registrations will not be canceled for failure to pay tuition. Nonpayment will not release students from the financial obligation for tuition charges. Students are strongly encouraged to follow University procedures and meet published deadlines to officially drop classes and be released from charges. Stopping payment on a tuition draft does not constitute a cancellation of the student's registration.

Payment/Cashiers Office

Students may pay for tuition and fees with personal checks, money orders, cash, or credit card (VISA, MasterCard, Discover and American Express). The Cashiers Office no longer accepts credit card payments at the window. Cash payments should be made at the Cashiers Office ONLY. Check/money order payments may be mailed to Accounts Receivable/Cashiering, Old Dominion University, Alfred B. Rollins, Jr. Hall, Norfolk, VA 23529-0045. Personal checks will be accepted for the exact amount of fees and/or other

amounts owed the University. Students may make credit card payments via Leo Online. Students who pay using a credit card will be charged a convenience fee. Third party payments are accepted upon submission of authorization documents. Payments on all financial obligations to the University will be applied on the basis of age of the debt. The oldest debt will be paid first. Postdated checks are not scrutinized and will be deposited upon receipt. The Cashiers Office does not cash checks or make cash refunds. Checks must be provided in US dollars. Checks written in excess of assessed fees or other amounts paid the University will be accepted and processed, but the excess will be refunded to the student by mail or electronically at a later date. Over-payments on students' accounts of \$5 or less that are not created by a financial aid disbursement will not be refunded unless students request the refund from the Accounts Receivable office.

Third-Party Payment Authorizations

The financial guarantee for payment of tuition and fees must be addressed specifically to Old Dominion University, Accounts Receivable, and printed on agency letterhead, purchase order, or voucher. Payments must be unconditionally guaranteed and made by the due date specified on the University's invoice. Amendments to the financial guarantee are required in writing. Prior to the University processing authorizations, students may receive an individual billing statement. Students must provide the third-party billing authorization or government training voucher to the Office of Finance before the student's individual payment due date. Failure to submit the authorization by the established deadline may result in a student billing, assessment of late fees and a financial hold on the student's account. An agency with a past due balance may have billing privileges terminated. Sponsoring agencies and students being sponsored by these agencies should be aware that the student is ultimately responsible for any defaults in payments by the sponsoring agency. A student whose employer or sponsor reimburses him or her for tuition after receipt of grades is not considered a third party. A student must pay in full upon registration or by the stated due date to avoid financial penalties. Contact the third-party billing coordinator for billing requirements or check the University web site.

Student Account Inquiry

The University reserves the right to request information on the student identification number and/or a photo identification when releasing information or conducting other financial transactions. Specific account information will be released only to the student. Each student account can be viewed using any Internet browser. Students are strongly encouraged to access records directly through their secure access site on www.leonline.odu.edu. Students are expected and required to assume responsibility for their own financial matters and to abide by the laws of the Commonwealth and the rules and regulations of the University. Failure to read and comply with University regulations will not exempt students from whatever penalties they may incur.

Delinquent Accounts

The University will not issue a degree, diploma, transcript of grades, grade report, or permit a registration for future terms to any student who has not paid all debts in full. Students with account holds are permitted to drop classes to reduce debt or withdraw to prevent academic penalty.

Collections

Virginia State law requires that the University make every attempt to collect past due amounts owed to state agencies. If, after 120 days, full payment of a debt has not been received, the account will be placed with a collection agency. Account holders are responsible for any collection costs incurred at a rate of 25% of the total due. Several other actions may be taken including the following: the account can be listed by the Credit Bureau as a bad debt; a delinquent account can be collected in full from income tax refunds, lottery winnings or other refunds due from the state (for Virginia residents); and the account may be turned over to the Virginia Attorney General's Office for litigation. Timely payment is strongly encouraged so that collection efforts can be avoided.

Set-off Debt Collection Act

The University pursues debt in accordance with the guidelines set forth by the Commonwealth of Virginia in the Virginia Debt Collection Act. Under the provisions of this act, an individual's Virginia income tax refund, lottery winnings or other refunds due from the state will be subject to the University's claim for any unpaid balance of tuition and fees. Any communication disputing an amount owed must be submitted in writing to the accounts receivable manager, Office of Finance.

Dishonored Checks and Charge Cards

A \$50.00 fee will be charged for each returned check or charge. If collection action is necessary, students will be liable for all collection agency costs. Stopping payment on a tuition draft does not constitute a cancellation of the student's registration. Each account will be allowed two returned checks, after which payment by check will not be accepted. This includes returned electronic payments. Care should be taken when entering bank account information when making an electronic payment. The \$50 fee will not be waived for errors in account entry.

University Payment Plan (not available on past due balances)

The University offers a payment plan during fall and spring semesters ONLY. Payment plan agreements may be obtained through Leo Online and are established for a specified four-month period each semester (refer to the Office of Finance website). Payment plans are established on the student's total charges for tuition and/or housing. There is a \$40.00 non-refundable processing fee to establish the plan each semester. Students must be in good standing with their student account to be eligible to participate. Payment plan forms are available on the University's web site. Failure to pay on time may prevent students from using the payment plan process to defer payments in future terms. If any payment is 30 days past due, the student will be removed from the payment plan and the entire payment plan balance will be due and payable. A 5% late penalty will be assessed on the entire balance if a payment is 30 days past due.

Tuition Refund Policy

The total tuition is considered fully earned by the University once scheduled classes have begun in any semester or summer session. Failure to attend the course after registering is not justification for elimination of charges.

For refund purposes, the beginning date of class is defined as the first official class date for the term. Students desiring to drop or withdraw from the University must formally notify the University using the official procedures set by the Office of the University Registrar. Refunds will be computed based on the actual withdrawal date certified by the Office of the University Registrar. Refunds will not be made to students who do not attend classes and have not completed the required withdrawal procedure. Refunds are issued by check or electronically (for those who sign up for e-Refunds) for all payments, including credit cards. Please refer to the Office of Finance website at <http://www.odu.edu/admissioncosts-tuition/tuition/refunds> for refund dates.

Tuition Differentials

In accordance with the refund periods, a full or partial refund of the difference between tuition paid and the new tuition charges will be granted if the per credit rates differ. In those instances where the revised tuition charges are greater, the additional tuition charges will be assessed.

Drop and Add

No refund or additional tuition charges are assessed for students who drop and add an equal number of credit hours on the same day within the same semester/session if the per credit tuition rates are the same.

Special Situations

Administrative drops, as in the case of classes canceled by the University or the case of academically suspended students, entitle the student to a full refund of tuition.

Refund Policy on Financial Aid Funds

Federal regulations mandate the treatment of refunds for financial aid recipients. Financial aid funds are returned to the government when charges were paid by financial aid and a refund is given a student who fully withdraws from the University. Financial aid recipients may request more detailed information from the Financial Aid Office as federal refund guidelines are subject to change.

Tuition Appeal Policy

Students who must withdraw (with a grade of W or WF only) after the end of the refund period may appeal for a refund under the Tuition Appeal Policy. The purpose of the tuition appeal process is to provide an opportunity for students to explain mitigating circumstances that prohibited them from course completion. All appeals must be in writing with supporting documentation as appropriate. Upon review of the information submitted, the Tuition Appeal Committee may approve a refund or a release of financial charges under pre-approved conditions or recommend an exception. Committee decisions are final.

Students have the responsibility to submit an appeal within one year of the tuition due date for which charges are being appealed and to demonstrate compliance with the policy. Documentation is required, especially in cases of illness, death, and changes in employment shifts or military orders. Depending on the complexity of the appeal and the receipt of all supporting documentation, processing time on appeals can vary from two to four weeks. Late fees and collection fees are not appealable charges.

Tuition appeals will generally be approved for the following reasons as long as the appropriate supporting documentation on official letterhead with original signature is provided: extended periods of physical illness, extended periods of physical or mental illness of the student's immediate family member, death of a student's immediate family member, job transfers outside of Hampton Roads or extended campus site, involuntary changes in employment schedule or military deployment, or a statement from the Office of Student Affairs authorizing an administrative withdrawal for medical reasons.

Students are strongly discouraged from submitting appeals that are based on lack of awareness of University policies and procedures, changes in personal circumstances or decisions, dissatisfaction with academic progress, or personal errors in judgment, including not attending class, as they will not be considered for approval. Issues related to the dissatisfaction with course content, delivery of instruction, or dissatisfaction with an advisor or instructor should be addressed with the chair of the academic department rather than through this appeal process.

Tuition appeal forms are available from the Office of Finance web site. Please refer to the Office of Finance website for full details: <http://www.odu.edu/admission/costs-tuition/tuition/appeals>.

Employee Fee Waiver

Full-time faculty and staff registered for on-campus courses may have the transportation fee waived provided a faculty/staff parking decal has been purchased. Accounts are adjusted after the end of the drop/add period.

Senior Citizen Tuition Waiver

An educational benefit under the Code of VA 23-38.54-60, Senior Citizen's Higher Education Act of 1974, a senior citizen shall be permitted under regulations as may be prescribed by the State Council of Higher Education:

- To register for and enroll in courses as a full-time or part-time student for academic credit if such senior citizen had a taxable individual income not exceeding \$15,000 for Virginia income tax purposes for the year preceding the year in which enrollment is sought;

- To register for and audit courses offered for academic credit; and
- To register for and enroll in courses not offered for academic credit in any state institution of higher education in the Commonwealth of Virginia.

Such senior citizen shall pay no tuition or fees except those established for the purpose of paying for course materials, such as laboratory fees, but shall be subject to the admission requirements of the institution and a determination by the institution of its ability to offer the course or courses for which the senior citizen registers.

Senior citizen eligibility terms require that individuals must:

- Be at least age 60 before the beginning of the semester.
- Have had legal domicile in the Commonwealth of Virginia for at least one year before the first day of classes.
- Enroll in no more than three courses in a given semester with a tuition waiver.
- Register only on or after the first official day of classes. (Eligible students may submit the form found at www.odu.edu/registrar, but staff will not process the form prior to the first day of classes for the semester.)
- Have a taxable individual income not exceeding \$15,000 for Virginia income tax purposes for the preceding year in order to be exempt from tuition for credit-bearing classes.

Senior citizens may be admitted to a course only on a space-available basis after all tuition-paying students have been accommodated.

Audited classes (no credit) are tuition-free for all senior citizens domiciled in VA.

Perkins Loan Exit Interviews

The Perkins Loan Program requires that all recipients attend an exit interview before graduating, leaving the University, or attending less than half-time for the semester enrolled. During the interview session, the student is informed of his or her rights and responsibilities, including grace period, deferments and how they work, and cancellation privileges. Students are notified of exit interviews by mail. If a student fails to attend the exit interview or return the required materials, a hold is placed on the student's account, transcript and/or diploma until the University has received all the proper paperwork required to meet federal regulations. The Federal Direct Student Loan program is a distinctly separate loan program and has another exit process. For information on the Federal Direct Student Loan exit interviews, please contact the Office of Financial Aid.

Deferment for Veterans

Old Dominion University offers a deferment for veterans, which extends the payment deadline for students whose veterans' benefits are not available by the tuition deadline. Generally, the deferment period extends the date of payment until the specified date shown below or until funds become available, whichever comes first. Deferments are a separate program and should not be confused with other University payment arrangements.

Students participating in educational programs through the Department of Veterans Affairs (VA) may qualify for a deferment of tuition only. Interested students should contact the Office of the University Registrar for more information. Deferments are only granted prior to the tuition deadline for each semester, provided all past due debts are satisfied. Veterans' deferments expire on November 1 for fall and April 1 for spring. No VA tuition deferments are offered for summer sessions.

Balance of Aid Refunds

Grants, scholarships and loans are credited to the student's account in the order received. After all charges are fully paid, refunds will be issued as excess payments are credited to the account. Expected installment payments are deducted from the account prior to the release of the refund. All refund checks (except Plus Loan refunds) are made payable to the student and are mailed to the student's permanent home address or electronically deposited. The refund check will be mailed five to seven business days after the

refund entry is made on the account. Due to security reasons, checks are not available for pick up.

Replacement Checks

Checks that are lost, mutilated or destroyed can be replaced. Mutilated or expired checks should be submitted for replacement. For checks that are lost, 10 business days from the date the original check was issued must expire before a written request for a replacement check will be accepted. The ten-day period allows for the original check to be forwarded by the postal service or returned to the University. A "stop payment" of the original check requires two-four business days to process at the bank. Once the stop payment has been confirmed by the bank, a replacement check can be issued. Expect a minimum of an additional two-four business days to process a replacement check. Please note that international checks will take longer.

Education Tax Credits

The Taxpayer Relief Act (TRA) of 1997, enacted by Congress, created two tax benefits for families who are paying for higher education. On January 31 of each year, all eligible students are issued a 1098T form for the prior calendar year. Students are directed to consult a tax professional or the Internal Revenue Service for matters related to tax credits.

Contact Information

Information related to tuition and fees, billing, refunds, payment options and related forms may be directed to Customer Relations located in the downstairs lobby of Alfred B. Rollins, Jr. Hall:

Local (757) 683-3030

Toll-free (800) 224-1450

e-mail tuition@odu.edu.

Payment address:

Office of Finance

Old Dominion University

Alfred B. Rollins, Jr. Hall

Norfolk, VA 23529.

Fees for Noncredit Programs

The fees for noncredit programs vary according to the activity. Noncredit courses are free to all senior citizens on a space-available basis.

Graduate Financial Aid

Office of Financial Aid

The Office of Student Financial Aid supports the mission of the University by assisting students and their families in reducing or eliminating financial barriers that might prohibit their participation in the degree programs offered by Old Dominion University. The office administers need-based financial aid programs funded by Federal, State, University and private sources in the form of grants, Federal work-study programs, and both merit-based and need-based scholarships. In addition, the office administers the William D. Ford Federal Direct Unsubsidized Loan program and the Federal Direct PLUS and Grad PLUS loan programs, all of which are non-need-based federally supported sources of funding. Alternative loan options are also available.

Financial resources are available to assist Old Dominion University graduate students with their educational costs. Most stipends awarded to graduate students are insufficient for meeting all living expenses; therefore, other sources of income are necessary. Financial sources for graduate students typically include teaching, administrative and research assistantships, fellowships, tuition grants (all administered through the academic colleges) as well as Federal Direct Stafford Loan Programs, and part-time student employment (administered through the Career Management Center). Additional information about need-based financial assistance is available from the Office of Financial Aid.

Prospective graduate students should also consider applying for national fellowships, such as those awarded by the National Science Foundation, the Woodrow Wilson National Fellowship Foundation, the Ford Foundation (minority fellowship program), and the Danforth Foundation. Applicants should check program deadlines, some of which are as early as December 1. Information on fellowships in specific fields is available from the chair or program director of each department/school.

Regulations governing the administration of student financial aid are subject to unanticipated change. Information provided herein is as accurate as possible on the date of printing. For additional and updated information, students and interested parties are invited to visit the office's web site at <http://www.odu.edu/af/finaid/index.shtml> or Old Dominion University's home page <http://www.odu.edu>.

Scholarships, Grants, Loans and Student Employment

The University offers a variety of awards each year to qualified students who have been accepted for admission into degree programs. Some of these awards are available only to Virginia residents, while others are awarded without regard to state residency. Student assistance is offered on the basis of scholastic achievement and/or established financial need. Financial need is defined as the difference between the cost of education/attendance at Old Dominion University and the amount of money an applicant and his or her family are expected to make available from their income and assets to meet the expenses of that education. The eligibility for non-need Federal Direct Unsubsidized loans and Federal Direct PLUS loans is determined by a combination of factors, including cost of attendance, and aggregate amount borrowed to date, to name a few.

To be eligible for assistance from the major student aid programs, a student must:

- be a citizen or an eligible non-citizen;
- admitted and enrolled as degree seeking in an eligible program;
- must be registered with the Selective Service (if required);
- must not be in default or owe a repayment or refund on a federally guaranteed loan or grant;
- and must be in good academic standing (making satisfactory academic progress) to be eligible for financial assistance. Certain aid programs require a student to maintain a full-time status.

There is one exception to the requirement that students be admitted on a degree-seeking basis: students who are admitted only for purposes of

teacher certification may qualify for a William D. Ford Federal Direct Loan by submitting memo verifying their admission into approved licensure program by Director of Teacher Education Services in the Darden College of Education.

Financial aid eligibility is determined on an annual basis for one academic year (fall, spring, summer) only, and is determined for succeeding years upon re-application and continued eligibility. Applications for Old Dominion University-administered financial aid should be submitted as early as possible in January for consideration in the following academic year.

To be considered for the Annual and Endowed Scholarships administered by the University, an Admissions application or the Scholarship Application for Continuing Students must be received by the University by February 15 preceding the academic year of interest. All admitted students will automatically be considered.

An entering student must be accepted for admission into a degree-seeking program before receiving a financial aid eligibility notification letter, however, a student who has not yet been accepted for admission may apply for financial assistance. Once admitted into an eligible degree program, the student will automatically receive a notice of tentative financial aid eligibility. Announcements of financial aid eligibility for early applicants are generally made before May 1. The applicant will be notified in writing by the Office of Student Financial Aid. In addition, the admitted student is encouraged to monitor the status of his/her application for aid and its subsequent processing by accessing his/her records on the University's secure online site, LEO Online at www.leoonline.odu.edu. Alerts, reminders, and student-specific information are mailed through the University's secure e-mail system throughout the year, and students are responsible for reading and responding to these communications.

The information regarding financial aid contained in this catalog is subject to changes or deletions without notification. Additional information concerning financial aid is available through the Office of Student Financial Aid. The Guide to Federal Student Aid, which describes the federal student aid programs and how to apply for them, is also available free of charge from the Federal Student Aid Information Center (1-800-433-3243). The U.S. Department of Education provides efficient and secure access to information and government services and benefits for students via the web site (<https://studentaid.ed.gov/>).

Application Requirements

To be considered for financial aid, a student must complete all documents and submit them as soon as possible after January 1 preceding the academic year for which application is made. (For example, a student planning to attend during the Fall Semester, 2013 would submit a financial aid application in January, 2013.) The documents and deadlines are described below. Note: The Free Application for Federal Student Aid (FAFSA) is required of all applicants for financial aid.

Document 1: The Free Application for Federal Student Aid (FAFSA)

The Free Application for Federal Student Aid (FAFSA) is available to fill out online at www.fafsa.ed.gov (<http://www.fafsa.ed.gov>). The site is known as FAFSA on the Web. Get U.S. Department of Education personal identification number called a PIN at www.pin.ed.gov (<http://www.pin.ed.gov>). Find out what documents you need at www.studentaid.ed.gov/docs (<http://www.studentaid.ed.gov/docs>). Fill out the FAFSA on the Web Worksheet at www.studentaid.ed.gov/worksheet (<http://www.studentaid.ed.gov/worksheet>) (this step is optional; the worksheet was designed for students who feel more comfortable filing something out on paper before going online to enter their application information). When completing the FAFSA, use Old Dominion University's Title IV Institution Code (003728). Fill out the FAFSA at www.fafsa.ed.gov (<http://www.fafsa.ed.gov>). Keep an eye on your e-mail for a response and further instructions. FAFSA are also mailed to student by the U.S. Department of Education upon the student's request (call 1-800-433-3243). The paper FAFSA should be mailed to the Department of Education's federal processor, not to Old Dominion University. A pre-addressed envelope is provided with each application. Because the FAFSA must

reflect income for the calendar year preceding the academic year aid is being applied for, it cannot be signed or mailed until after January 1.

Document 2: Student Aid Report (SAR)

Once the FAFSA is received and processed, you will receive your results by e-mail within a few days. This e-mail will contain a secure link so you can access your SAR online. If you have a "blocked" folder in your e-mail files, check it. Otherwise you'll receive a paper SAR in the mail in about two weeks. Students are strongly encouraged to keep their SARs and all other financial-aid-related documents for future reference. The SAR contains valuable information as well as a unique data release code.

Document 3: Employment Eligibility Verification

All U.S. employers are responsible for completion and retention of Form I-9 for each individual they hire for employment in the United States. This includes citizens and non-citizens. On the form, the employer must verify the employment eligibility and identity documents presented by the employee and record the document information on the Form I-9. Additional information can be obtained from the Office of Finance.

Document 4: Consortium Agreement and Dual Enrollment Forms

Students attending classes at a distant site may be required to submit these forms. These students should consult with their site director and their financial aid counselor to determine if these forms are required.

Standards of Satisfactory Academic Progress to Maintain Financial Aid Eligibility

Old Dominion University Requirements

Fulfillment of Federal Satisfactory Academic Progress is reviewed and evaluated by the Financial Aid Office in compliance with federal regulations. In order to qualify for assistance through the Office of Student Financial Aid, students must be accepted by the University as degree-seeking students. Students must be enrolled at least half-time (50%) to qualify for most financial aid programs.

Graduate students must be enrolled for a minimum of nine hours during either the fall or spring semester to be considered full-time or 6 or more hours during the summer. Three-quarter time enrollment is 6-8 during the fall or spring semesters or 4-5 hours in the summer semester. Half-time enrollment for graduate students is four hours during either the fall or spring semesters or three hours during the summer semester.

Eligibility and award amounts are based on the number of semester hours in which the student is enrolled. For purpose of financial aid, courses taken as Audit course do not count toward enrolled hours

The following quantitative and qualitative requirements apply to financial aid programs administered by Old Dominion University for satisfactory academic progress.

Policy

Maintaining Satisfactory Academic Progress is one of many federally mandated criteria viewed in determining a student's eligibility for continued receipt of financial aid. Progress is measured by PACE (the number of credits earned in relation to those attempted), Qualitative (GPA) standard and Allowable time (the maximum time frame allowed to complete the academic program). Students must also demonstrate a progression toward completion of their degree program within an established timeframe. Failure to maintain Satisfactory Academic Progress will result in loss of financial aid eligibility. Progress is reviewed annually, at the end of the academic year.

A. PACE

Graduate

In order to maintain Satisfactory Academic Progress, a graduate student is required to complete 80% of the total credit hours attempted.

How to calculate PACE

Cumulative number of credit hours student successfully completed
Cumulative number of credit hours student attempted

B. QUALITATIVE

Qualitative Satisfactory Academic Progress for students is evaluated in accordance with the following table.

Hours Earned	Minimum G.P.A
1+	3.0

C. ALLOWABLE TIME

The maximum allowable time to be eligible for financial aid for a full-time Master's degree is three (3) years and for a full-time Doctoral degree four (4) years.

Graduate students may attempt a maximum of 90 hours. Graduate students working on a second degree will be given an additional 45 credit hours to earn their second degree. *Note: Transfer credit hours are included.

Satisfactory Academic Progress Review

The Office of Student Financial Aid will conduct a review of Satisfactory Academic Progress at the end of each academic year. Email notifications of SAP standard(s) not met will be sent to the student's ODU email account.

*Please note that students who have not received financial aid in previous years, but are applying for financial assistance for the first time will also be held to the requirement of maintaining Satisfactory Academic Progress. Satisfactory Academic Progress is reviewed for all semesters of a student's enrollment regardless of whether the student was eligible for financial assistance during a term. **If students exceed the maximum allowable time, they are not meeting satisfactory academic progress, thus, all aid will be suspended.***

Financial Aid suspension does not prohibit you from continuing your education at Old Dominion University. It does prohibit you from receiving financial aid until you again meet the standards for Satisfactory Academic Progress.

Financial Aid Suspension

Students who fail to meet satisfactory academic progress are placed on financial aid suspension. You have the option to appeal this suspension. An appeal must be based on significant mitigating circumstances that seriously affected academic performance. The decision of the appeal will be sent via email to the students ODU email account. *Note: **Please make sure your email account is activated.**

Financial Aid Probation

For students who are successful in their appeal, aid will be reinstated; however, placed on probation for one payment period/term. Emails will be sent to students on financial aid probation advising them of the conditions needed. At the conclusion of the probation term, the student must be meeting the school's SAP standard in order to qualify for further Title IV Funding.

The Appeal Process

The appeal form may be downloaded from our website at <https://www.odu.edu/finaidoffice>.

The basis for an appeal includes:

1. Death of a relative
2. Student/parent injury or illness
3. Serious illness or injury of a parent/guardian, spouse, or child that required you be the primary caregiver and prevented you from passing the course(s)
4. Other special circumstance (ex, divorce/separation, natural disaster, extreme change in financial or legal circumstances, etc.)

Appeals will NOT be accepted for the following conditions:

1. Encountering a situation that could have been anticipated, such as the need to have transportation, the need to pay for ordinary living expenses, the need for child care, etc.
2. Change of major
3. Dissatisfaction with course material, instructor, instructional method, or class intensity
4. Lack of motivation change in academic interest

If you would like to file an appeal for reinstatement of your eligibility for financial aid, please follow these directions:

1. **Use the SATISFACTORY ACADEMIC PROGRESS APPEAL FORM to write your appeal.**

State clearly why you failed to meet the condition(s) cited.

Attach documentation if necessary.

State what has changed that will allow you to demonstrate SAP progress at the end of the next evaluation period.

To confirm your extenuating circumstance(s), you must attach documentation from an objective third party (e.g. physician, counselor, lawyer, social worker, teacher, religious leader, academic advisor).

We realize that sharing personal information can be difficult. Be assured that your statement will remain confidential. Only financial aid personnel will review your appeal.

2. **Meet with your academic advisor or the dean of your college to complete the REQUEST FOR WRITTEN EVALUATION OF ACADEMIC PERFORMANCE form.**

NOTE: If you submit your appeal without the advisor or dean's evaluation, your appeal will not be considered

3. **Submit your complete appeal packet and all supporting documents within 14 days of receipt** of this notification. Failure to submit the complete packet will result in cancellation of aid.

ALLOW TWO WEEKS for the review of this appeal and receipt of the decision notification. If your appeal is approved, the decision notification will outline the conditions of your contract for reinstatement of aid eligibility. The contract is binding and your academic progress will be reviewed at the end of the enrollment period specified. If your appeal is denied, the decision notification will specify the conditions for future consideration for financial aid eligibility.

The decision of the financial aid review committee is FINAL and cannot be appealed.

If the appeal is unsuccessful, an email notification will be sent notifying you of the decision and also information on how to re-establish eligibility if applicable.

Re-establishing eligibility

Students may re-establish their eligibility for financial assistance by achieving the satisfactory progress standards. Keep in mind this will be at the student's own expense as they are ineligible for financial aid. Sitting out a semester at Old Dominion University will not assist in re-establishing eligibility. Once the student has earned the required grade point average or completed the required credit hours, they must contact financial aid to request the reinstatement of their financial aid eligibility.

Students not making SAP at the end of the second year, but at the end of the subsequent grading period come into compliance with the school's graduation requirements; will be considered making SAP beginning with the next grading period.

Withdrawing from courses

Withdrawing from courses may impact your financial aid awards. Before withdrawing from class, you should contact the Financial Aid Office to determine the consequences.

Withdrawing from the University

Students who totally withdraw from the University and receive aid may owe the University money. Before withdrawing from the University, you should contact the Financial Aid Office to determine the consequences.

Withdrawing from all courses for two consecutive semesters may result in loss of financial aid eligibility.

Students who withdraw from all courses are subject to regulations regarding the Return to Title IV Funds requirement. If the date of complete withdrawal precedes the date on which 60% of the academic semester has been completed, a prorated portion of all Title IV student financial assistance will be due back to the federal programs. The University policy regarding tuition refunds following withdrawals is stated in the catalog and is independent of the Return to Title IV funds regulations. Students who withdraw from the University before 60% of the semester has elapsed should anticipate repaying a significant portion of the Title IV financial assistance. Additionally, students who failed to earn a passing grade during the term are subject to the same federal guidelines.

Transfer and Repeat Coursework

Accepted transfer credits must count as both attempted and completed hours.

Repeated coursework will count toward enrollment status where no more than one repetition of a previously passed course or any repetition of a previously passed course due to the student failing other coursework in a prior term.

Example:

Student enrolls in 4 fall courses – pass 3 and fails 1

School required student to retake all 4 courses

May count the failed course in the next enrollment status

May not count the passed courses

Remedial courses are counted, however, enrichment and ESL courses ARE NOT taken into consideration.

Federal Programs

Students must submit the Free Application for Federal Student Aid (FAFSA) to determine eligibility for all of the following federal financial aid programs.

Federal Work Study (FWS) Program

This program provides jobs for undergraduate and graduate students with financial need, allowing them the opportunity to earn money for educational expenses. The FWS program encourages community services work such as tutoring and work related to the course of study. A student who qualifies for FWS is not automatically guaranteed employment and must compete with other FWS recipients for available positions. The Career Management Center, located in Webb University Center, maintains a listing of available positions on its web site at <http://www.odu.edu/ao/cmcc/>.

Federal Perkins Loan Program

This low-interest (5 percent) loan is targeted for students with exceptional financial need. A Federal Perkins Loan borrower is not charged an origination fee or an insurance premium. A Federal Perkins Loan must be repaid.

Federal Direct Student Loan Programs

Old Dominion University participates in the William D. Ford Federal Direct Loan Program and thus receives loan funds directly from the U.S. Department of Education upon disbursement (payment) to eligible students. There are two kinds of loans:

William D. Ford Federal Direct Unsubsidized Loans

Available to eligible students regardless of financial need, but students will be required to pay all interest charges, including the interest that accumulates during deferments.

PLUS Loans for Graduate or Professional Students

Graduate or professional students are eligible to borrow under the PLUS Loan Program up to their cost of attendance minus estimated financial assistance in the Direct Loan programs. This requirement includes a determination that the applicant does not have an adverse credit history, repayment beginning on the date of the last disbursement of the loan.

Applicants for these loans are required to complete the Free Application for Federal Student Aid (FAFSA) and must have applied for their annual loan maximum eligibility under the Federal Unsubsidized Stafford Loan Program before applying for a Graduate/Professional PLUS loan.

Conditions for Disbursement of Financial Aid

The Office of Student Financial Aid publishes a "Statement of Student Responsibility & Conditions for Release of Financial Aid" document each academic year. This statement is included with the initial award notification mailed to the student and is also accessible on the Financial Aid Office page of the University web site <https://www.odu.edu/finaidoffice>. When students accept financial aid, they also acknowledge that they have read and agree to comply with the Statement. A limited sample of conditions is as follows:

Initial financial aid notices are based on the assumption that the student will enroll full time.

Students are required to communicate immediately with their counselors any changes in the enrollment level or student type during the period leading up to the beginning of each semester as they may impact the student's aid eligibility. Financial aid is based upon full-time (9 credits or more), three-quarter (6-8 credits), or half-time enrollment (4-5 credits). If a student's aid has been calculated based on an enrollment level different from the actual enrollment for that semester, the aid will not be released until the student has notified the counselor and the counselor has reviewed and recalculated aid eligibility. Financial aid eligibility changes when enrollment level changes. Students who drop courses are responsible for notifying the financial aid counselor immediately. It is the student's responsibility to notify the financial aid office if the student type changes (example: degree seeking to non-degree/certificate program). Aid will be reduced accordingly and financial aid already received will be due back to the University. This also applies to "balance-of-aid" payments made to students prior to dropping.

The student is responsible for repayment of any and all financial aid received if adjustments resulting from unreported or misreported information discovered through verification, third-party notices, account reviews, and/or Quality Assurance findings that lead to reductions in aid. Documents such as Federal Income Tax transcript, W-2 forms, Leave and Earning Statements, notices of SSI benefits, and Verification Worksheets may be required. Other documents may be requested to confirm marital status or other information provide on the FAFSA during the verification process.

1. The student is responsible for reporting additional educational assistance received through sources other than the Financial Aid Office. Financial aid may be adjusted according to federal regulations as a result of additional educational assistance received and not reflected initially. The student bears responsibility for reporting any additional aid in the form of scholarships from outside sources, Vocational Rehabilitation Benefits, Graduate Tuition Scholarships, Veterans Benefits, Senior Citizen Tuition Waivers, Employer Assisted Tuition Payments, Third Party Payment Agreements involving any outside group or company, and all other forms of assistance. The student must report these external sources of financial assistance immediately to his/her financial aid counseling team.
2. Federal Direct Student Loans and Federal Perkins Loans require Promissory Notes. Federal Direct Student Loan promissory notes may be signed online. Federal Perkins Loan Promissory Notes are produced by the Office of Student Financial Aid after all eligibility conditions have been met. Students must complete and sign the promissory notes and return them to the Financial Aid Office before the loan process can be completed. Entrance loan counseling is required of all first-time borrowers prior to release of loan proceeds.

3. A tentative or conditional financial aid package assumes a level of government appropriations which are frequently underdetermined at the time of preparation. If legislative bodies fail to provide the anticipated funding level, it may be necessary to reduce or cancel certain types of aid, particularly grants. Students will be notified immediately if such changes become necessary.
4. The Office of Student Financial Aid reserves the right to review, modify or cancel financial aid at any time on the basis of new information affecting student eligibility, including but not limited to changes in financial resources, residence, academic status, or changes in the availability of funds.
5. Students who withdraw from ALL courses are subject to regulations regarding the RETURN OF ALL TITLE IV FUNDS. If the date of complete withdrawal precedes the date on which 60% of the academic semester has been complete, a prorated portion of all Title IV student financial assistance will be due back to the federal programs. The University policy regarding tuition refunds following withdrawal is stated in the catalog and is independent of the Return of Title IV funds regulations. Students who withdraw from the University before 60% of the semester has elapsed should anticipate repaying a significant portion of Title IV financial assistance.

Awards Based on Admission to the University

Annual and Endowed University Scholarships

Scholarships at Old Dominion University have been established through the generosity of individuals, organizations and corporations to recognize outstanding academic performance and to assist students in pursuing their educational goals. Scholarship awards are based on a variety of criteria. For some awards, eligibility is entirely determined by academic merit or potential. Other requirements might include demonstrated financial need, field of study, state or city residency, graduation from a particular high school or participation in a specific program, organization or activity. Generally, recipients have earned at least a 3.4 grade point average (on a 4.00 scale) and are full-time, degree-seeking students.

The Scholarship Form for Continuing and Graduate Students is available for students who are:

Students who have a change in scholarship eligibility according to the Criteria Check List (included in the Scholarship Form)

Continuing students who meet the above circumstances must complete and submit the form to:

Office of Student Financial Aid
121 Rollins Hall
Norfolk, VA 23529-0052

The form must be received by February 15 each year to be considered for scholarships for the following academic year. The information provided on the Form for Continuing and Graduate Students will be maintained and used for scholarship selection for the duration of the student's attendance at Old Dominion University. It is not necessary to complete the form more than once during attendance at Old Dominion University, UNLESS the required information has changed. To determine eligibility for need-based scholarships (designated by an asterisk (*)), students must also file the Free Application for Federal Student Aid (FAFSA) PRIOR to February 15 of the appropriate academic year.

Selection procedures vary for these awards. All scholarships require admission to and enrollment in a degree program at Old Dominion University. For some scholarships, a portfolio, an audition or participation in a specific program may be required. The additional steps, if required, are summarized following each scholarship description.

Students will receive written notification of any scholarship for which they have been selected. Most scholarships will be awarded in April and May of each year. All scholarships must be formally accepted in writing.

College Scholarships

The College of Arts and Letters

The H. Lee Addison, III Scholarship in History was established by H. Lee Addison, III to assist a full time undergraduate or graduate student majoring in history that has a minimum GPA of 3.0

The Eliot S. Breneiser Memorial Scholarship was established to assist a full-time music major in either the piano performance program or the music education program with a concentration in piano. Information concerning audition requirements is available from the Music Department. (AUDITION, PARTICIPATION) (757) 683-4061.

***The Dr. James V. D. Card Scholarship Fund** was established by James V. D. Card to assist an undergraduate or graduate student who is majoring in English. The recipient must demonstrate financial need. (FAFSA)

***The Harriet W. '69 and Burl Fisher Endowed Scholarship in History** is funded by an endowment that was established by Harriet and Burl Fisher given in memory of her aunt, Mabel Gresham Cones, and his grandmother, Renie Wright Fisher. Preference will be given to one or more full-time graduate students in history who maintain GPA of 3.5 and demonstrate financial need. (FAFSA)

***The Friends of Women's Studies Scholarship** is funded by an endowment in honor of Carolyn Rhodes for students majoring in women's studies. Two scholarships are awarded: one to a graduate student seeking an M.A. in humanities and one to an undergraduate student. Graduate students must have a minimum grade point average of 3.50. Recipients can be full- or part-time students. (FAFSA)

***The Linda Hyatt Wilson Graduate Scholarship in China Studies** was established by Linda Hyatt Wilson to assist a full time graduate student who maintains a grade point average of 3.5, demonstrates financial need and is involved in the study of China's culture, history economy, politics, or foreign relations. (FAFSA)

***The Barbara M. Gorlinsky Memorial Fine Arts Scholarship** is made possible by an endowment the Gorlinsky family established in memory of their daughter. It is designed to assist students with financial need who are fine arts majors. Information concerning portfolio requirements is available from the Art Department. (PORTFOLIO, FAFSA) (757) 683-4047.

The Perry Morgan Fellowship in Creative Writing established in 2005 by Frank Batten and is awarded to two or more first year full-time graduate students enrolled in the creative writing program. Recipients must maintain a minimum 3.5 GPA.

***The Harvey Ronald Saunders Memorial Endowed Scholarship** was established by Mr. and Mrs. Louis M. Saunders to assist an undergraduate or graduate student majoring in the arts/fine arts with an emphasis in painting or drawing. The recipient must have a 3.00 minimum grade point average, demonstrate financial need and be a citizen of either the United States or Israel. Information concerning portfolio requirements is available from the Art Department. (PORTFOLIO, FAFSA) (757) 683-4047.

The Charles K. Sibley Art Scholarship is funded by an endowment made possible by contributions from the friends and patrons of the former Old Dominion University professor. Awards are to assist graduate or undergraduate students majoring in studio art or art history. Information concerning portfolio requirements is available from the Art Department. (PORTFOLIO) (757) 683-4047.

The David Scott Sutelan Memorial Scholarship is made possible by an endowment established by David, Charles, and May Scott Sutelan. The recipient will be seeking a master in fine arts in the creative writing program.

The Forrest P. and Edith R. White Endowed Scholarship Fund was established by Edith R. White to provide scholarships to students studying acting in the Old Dominion University Communication and Theatre Arts Department. (AUDITION)

Strome College of Business

***The Jeffrey W. Ainslie Endowed Scholarship in Real Estate** was established in 2006 by Jeffrey W. Ainslie to assist a full-time student in the Real Estate track in the Strome College of Business. The student must have a grade point average of 3.0 or higher and must demonstrate financial need. Preference will be given to the student with the highest GPA and demonstrating the greatest financial need. (FAFSA)

The Theodore F. and Constance C. Constant Fellowships are funded by an endowment that assists two full-time graduate students in the Strome College of Business.

***The Larry J. and Elizabeth J. Creef Endowed Scholarship** was established as an endowment by Larry J. and Elizabeth J. Creef to provide a scholarship to a student with an interest in pursuing a career with the Federal Bureau of Investigation (FBI), the CIA, the Department of Homeland Security, or other security agency of the U.S. government. The recipient must be a Virginia resident and a U.S. citizen, must demonstrate financial need, be a full-time student enrolled in the Strome College of Business, and must have declared a major in accounting. (FAFSA)

***The James A. Hixon Endowed Scholarship** was established by James A. Hixon to assist a full-time or part-time MBA student in the Strome College of Business. The student must have a cumulative GPA of 3.5 or better and demonstrate financial need. (FAFSA)

The Jesse and Sue Hughes International Accounting Scholarship was established by Dr. Jesse and Mrs. Sue Hughes to assist a full-time international student in the Strome College of Business who is a declared major in Accounting with a focus on public sector financial management. Preference is given to a student at the graduate level, however, if there is not an eligible student at the graduate level, then an undergraduate student can be considered for the scholarship award.

***The Max B. Jones Endowed Memorial Scholarship** was established by Katherine Jones Long and Susan K. Jones, in memory of their father, to assist a full-time or part-time graduate student enrolled in the Strome College of Business. The student must be a Virginia resident, must have a minimum cumulative GPA of 3.0, and demonstrate financial need. (FAFSA)

The Wolfgang Pindur Endowed Scholarship in Applied Research is funded by an endowment given by the Department of Urban Studies and Public Administration to assist a full-time or part-time master's student (MPA or MUS) and/or a doctoral student (PhD in Public Administration and Urban Policy). An essay concerning the student's commitment to public service will need to be provided. (Essay) (683-6856)

The Charles H. and Mary Kathryn Rotert Scholarship is funded by an endowment established by Mr. and Mrs. Charles H. Rotert Jr. This scholarship is awarded to a deserving student in the Strome College of Business.

***The Joseph and Donna Vestal Endowed Scholarship** was established by Joseph Vestal to assist a full-time student in the Strome College of Business, who has a GPA of 2.5 or higher and demonstrates financial need. The recipient must also be involved in campus student activities in a leadership program. (FAFSA)

The Susan (Merendino) Rowell Graduate Scholarship in Humanities was established in 2004 by Mrs. Susan S. Rowell to assist a graduate student majoring in humanities. The recipient must have a GPA of 3.4 or higher. This scholarship is renewable and preference will be given to students with full-time enrollment status.

The Marvin and Marilyn Simon Family Endowed Fellows Program in Business was established in 1994 to assist a master's or doctoral degree-seeking candidate attending the Strome College of Business. The recipient will be a talented student studying in business who has outstanding academic ability.

***The John R. Tabb Scholarship** was established by an endowment by the Tabb family in 2004. It is the desire of the family to assist a graduate student studying economic development with an international focus. The recipient must be a U.S. citizen with residency in North Carolina, Virginia, or Iowa.

A minimum grade point average of 3.5 and demonstrated financial need is required. (FAFSA)

The Tidewater Association of Service Contractors (TASC) Scholarship was established to assist a full-time undergraduate or graduate student from the College of Engineering and Technology or Strome College of Business degree program. A full-time/part-time Masters Certification in Government Contracting program or any other certificate program supporting government contracting within the Continuing Education Departments may also be considered. The scholarship recipient must have a minimum grade point average of 3.0

***The Rolf Williams Memorial Endowed Scholarship** was established by the Propeller Club of the United States, Port of Norfolk to assist a full-time undergraduate or full-time graduate student in the Strome College of Business. Student must be a rising senior with a declared major in Maritime and Supply Chain Management or a graduate student in the Master of Business Administration Program with a concentration in Maritime, Ports, and Logistics Management. Preference will be given to the student with greatest financial need and has at least a minimum of 3.0 cumulative GPA. (FAFSA)

***The Tevangudi P. Radhakrishnan Endowed Scholarship** was established by Rajesh Radhakrishnan to assist a full-time international student in the Strome College of Business.

The Dr. Bruce L. Rubin Endowed MBA Scholarship was established by Dr. Larry Filer, MBA Program Director, in the Strome College of Business. The scholarship recipient must be a newly- admitted and enrolled part-time student in the MBA program, have a minimum undergraduate grade point average of 3.2, and must have a minimum GMAT score of 600. Preference is given to a student who demonstrates volunteer service to the local business community.

The Darden College of Education

***The Coca-Cola Scholars Endowed Scholarship Fund** was established by the Coca-Cola Foundation. The scholarship recipient must be enrolled in a financial aid-eligible program leading to teacher certification, licensure, and/or enhancement. Consideration will be given to all students studying at rural Virginia TELETECHNET sites who have a minimum of 58 credit hours with a 3.00 cumulative grade point average. The recipient must also demonstrate financial need. (FAFSA, ESSAY)

The Sarah E. Armstrong Scholarship Endowment was established in 2002 in memory of the donor, Sarah E. Armstrong. The recipient must be a full-time student who has been accepted into the College of Education and must have an overall cumulative 3.2 grade point average.

The Linda Zydron Bamforth Scholarship in Early Childhood Education was established by Linda Z. Bamforth to assist a graduate student majoring in the Early Childhood Program (Pre-K -3) of the Darden College of Education. The recipient must be a full-time or part-time graduate student, has a minimum GPA of at least 3.5, and demonstrate love of children and dedication to early childhood education-evidenced by a copy of the applicant's last performance appraisal or student teaching evaluation.

The Bennett's Creek Sertoma Club Scholarship was established by the Bennett's Creek Sertoma Club to assist a full-time graduate student seeking a degree in Speech Pathology. The recipient must have a grade point average of at least 3.0. Preference will be given to a student from Suffolk, Virginia.

The J. Frank Sellw Memorial Scholarship in Education was established by the friends and family of Mr. Sellw. The recipient must have a GPA of 3.0 and major in a teacher education program. The recipient must also meet all teacher education admission standards established by their program of study and the Darden College of Education.

***The John Albert Gay Scholarship** is made possible by an endowment given by Dr. and Mrs. R. A. Gay (Florence Vaughan). This scholarship assists a graduate student majoring in special education. Preference is given to those specializing in the area of the emotionally disturbed child. Student must demonstrate financial need. (FAFSA)

***The Peggy Woofter Hull Scholarship** is made possible by an endowment given by Marie D. Woofter in memory of her daughter. It is awarded to a full-time doctoral student in education. Students are nominated by their graduate program director and are selected by the Office of the Dean of the Darden College of Education. Recipients must demonstrate financial need. (FAFSA)

***The Frank Hill Knecht Memorial Scholarship** is made possible by an endowment given by Lena Rosa K. Conley, an alumnus and retired staff member of Old Dominion University, in memory of her brother. This scholarship assists a full-time graduate student in education. Preference is given to study in the area of special education. (FAFSA)

The R.W. and Betty MacDonald Endowed Scholarship in Language Arts & Social Studies Education was established by Dr. Robert H. MacDonald and Ms. Betty Joan Matson in memory of and named for their parents. The recipient must be a graduate student enrolled in Language Arts or Social Studies Education and must have a minimum grade point average of 3.0.

***The Sertoma Club of Norfolk Scholarship for Speech Pathology** was established by the Sertoma Club of Norfolk to assist a Masters level first year full-time student enrolled in the Speech Pathology Program in the Darden College of Education. Student must have a minimum grade point average of 3.5 and demonstrate financial need. (FAFSA)

The Frank Batten College of Engineering and Technology

The Civil and Environmental Engineering Visiting Council Graduate Scholarship in Engineering was established by The Civil and Environmental Engineering Visiting Council (CEEVC) in 2003. The recipient must be either full- or part-time civil or engineering graduate student who has a minimum graduate or undergraduate grade point average of 3.25. Transfer students from other colleges or universities are also eligible for consideration.

The BBG Incorporated Endowed Scholarship in Engineering was established by BBG Incorporated for a rising junior or senior majoring in Electrical Engineering, Electrical Engineering Technology, Computer Engineering, or Computer Engineering Technology who holds a minimum cumulative GPA of 2.5. The scholarship is also available to a graduate student majoring in Electrical Engineering or Computer Engineering with a minimum cumulative GPA of 3.0. The recipient will also be considered for an Engineering Cooperative Education/Intern position with BBG Incorporated.

***The Rollie Dubbe' Engineering Scholarship** is funded by an endowment to assist a full time graduate engineering student who holds a minimum cumulative GPA of 3.0. The scholarship recipient must be enrolled in the civil engineering program with a preference in geo-technical engineering. Must demonstrate financial need (FAFSA).

The Stuart H. Russell Memorial Scholarship is made possible by an endowment established by the estate of Olive L. Spicer. The scholarship is awarded to a deserving student in the Frank Batten College of Engineering and Technology with particular preference given to a student in the Electrical and Computer Engineering Department with an interest in electronics.

The Tiwari Endowed Graduate Scholarship in Mechanical Engineering was established by Surendra N. Tiwari. The recipient must be a graduate level Mechanical Engineering student and be enrolled full-time or equivalent if registered as a Graduate Assistant. Must have a minimum Undergraduate or Graduate GPA of 3.0 and preference is given to an international student interested in scholarly activities and research.

***The Clarke and Susan Vetrone Endowed Scholarship** is funded by an endowment established by Clarke and Susan Vetrone to assist one undergraduate and one graduate student with an intending or declared major in the Batten College of Engineering and Technology. Both undergraduate and graduate student must be enrolled full-time and demonstrate financial need. Undergraduate student must have a minimum GPA of 2.75 and

preference will be given to a student with learning disabilities. Graduate student must have a minimum of 3.0 GPA. (FAFSA)

***The Edward L. White Endowed Scholarship** was established by Edward L. White, Jr. and Margaret W. Moore to assist a computer engineering student. The recipient must be a Norfolk resident, have a minimum 3.30 grade point average, and demonstrate financial need. (FAFSA)

The George C. Winslow Scholarship is made possible by an endowment to assist a graduate or undergraduate student who has demonstrated financial need and has obtained at least a 2.50 grade point average while pursuing a degree in mechanical engineering. (FAFSA)

***The Dr. Robert A. and Ronnie Slocum Magoon Scholarship for Aerospace Engineering** was established by Robert A. Magoon to assist a graduate student majoring in Aerospace Engineering. Scholarship recipient must demonstrate financial need. (FAFSA)

The Oktay Baysal Endowed Graduate Scholarship in Computational Engineering for Aerospace was established by Oktay Baysal to assist a graduate level Aerospace or Electrical and Computer Engineering student. The recipient must have a minimum grade point average of 3.0 and must have completed a minimum of 30 semester credit hours while attending ODU at either undergraduate and/or graduate level, or any combination thereof.

The College of Health Sciences

The Thomas Charles Auclair ('78) Scholarship is made possible through an endowment given by Mr. and Mrs. George E. Auclair in memory of their son. The scholarship supports a student pursuing studies in environmental health.

***The Chesapeake Regional Medical Center Nursing Endowed Scholarship** was established by the Chesapeake Regional Medical Center to assist a full time undergraduate or graduate student enrolled in Old Dominion University's Nursing Program. The student must demonstrate financial need and must agree to accept 120 clinical hours at Chesapeake Regional Medical Center, or its successor. (FAFSA)

***The DPS, Inc. Graduate Dental Hygiene Endowed Scholarship** was established by DPS, Inc. to assist a full time first or second year graduate dental hygiene student that has admitted into the Old Dominion University Dental Hygiene Program. The scholarship recipient must demonstrate financial need and hold a minimum GPA of 3.0. (FAFSA)

***The Friends of Dental Hygiene Endowed Scholarship** was established by Mrs. Linda Fox Rohrer in 2004. Recipients must be either full-time graduate or undergraduate students. The scholarship will be awarded to a deserving student in the School of Dental Hygiene. The recipient must also demonstrate financial need (FAFSA).

***The Gene W. Hirschfeld Scholarship** is supported by an endowment given by the former chair of the Department of Dental Hygiene and Dental Assisting. The scholarship is awarded to undergraduate or graduate students who demonstrate financial need and are enrolled in the Dental Hygiene Program. (FAFSA)

The Kate and George Maihafer Scholarship in Physical Therapy was established by George Maihafer to assist full-time graduate students majoring in Physical Therapy who have a minimum GPA of 3.25. Students eligible for the scholarship may apply for the scholarship starting in the spring semester of their first year of study. Students interested in the scholarship must submit an essay no longer than 500 words to the Physical Therapy Curriculum Committee describing their career goals within the physical therapy profession after graduation. The scholarship is to be awarded in the fall semester.

The College of Sciences

The Sarah E. Armstrong Science Scholarship Endowment was established in 2002 in memory of Sarah E. Armstrong. The recipient must be a full-time student who has been accepted into the College of Sciences and must have an overall cumulative 3.2 grade point average.

The Virginia S. Bagley Endowed Scholarship is made possible by Mrs. Bagley's estate and is awarded to a graduate or undergraduate student in the Department of Biological Sciences.

***The Hampton Roads Maritime Scholarship** is funded by an endowment from the Hampton Roads Maritime Association and is given to a graduate student in the Department of Ocean, Earth, and Atmospheric Sciences with financial need. (FAFSA)

The Neil and Susan Kelley Endowed Scholarship Fund, established by Neil Kelley in 2001, provide financial support to a graduate student pursuing a Master of Science in Oceanography. The scholarship is awarded strictly on merit and may be renewed annually.

The Harold G. Marshall and Vivian J. Marshall Scholarship in Biology is funded by an endowment given by Harold G. Marshall and Vivian J. Marshall. This scholarship is provided to assist a full-time graduate student in the Department of Biological Sciences with a specific concentration in ecology.

***The Jacques S. Zaneveld Endowed Scholarship** was established by Dr. Jacques S. Zaneveld to assist a graduate student in the Department of Ocean, Earth, and Atmospheric Sciences of the College of Sciences. The recipient must demonstrate a need for funding in the preparation of his/her dissertation in the field of biological oceanography. (FAFSA)

The Nick Savage Scholarship was established by Anne Raymond Savage to assist a full-time undergraduate or graduate student majoring in an area of science that involves field work and the study of plant life. Preference will be given to a student who is entering or returning to the field of teaching science. Student must maintain a grade point average of 3.0.

Military Awards

Army Reserve Officer Training Corps (AROTC) participants may qualify for scholarships. More information on application procedures and program requirements is available from the faculty of the Department of Military Science. (PARTICIPATION) (757) 683-3663.

Naval Reserve Officer Training Corps (NROTC) participants may qualify for full or partial scholarships. More information on application procedures and program requirements is available from the faculty of the Department of Naval Science. (PARTICIPATION) (757) 683-4744.

Other Awards (General)

The Alumni Association Outstanding Scholar Fellowships were established in 1984. The fellowships are awarded to two graduate students in good academic standing who are attending Old Dominion University on a full-time or part-time basis. One fellowship must be awarded to an Old Dominion University alumnus/alumna who has been admitted as a full-time student to a graduate program at the University.

The Bannon Foundation Quasi-Endowed Scholarship was established to assist four students of the Eastern Shore of Virginia with their commuter expenses.

***The Friends of Women's Studies Scholarship** is funded by an endowment in honor of Carolyn Rhodes for students majoring in women's studies. Two scholarships are awarded: one to a graduate student seeking an M.A. in humanities and one to an undergraduate student. Graduate students must have minimum grade point average of 3.50. Recipients can be full or part-time students. Students are selected by the Director of Women's Studies and candidate selection is forwarded to the Office of Financial Aid, scholarship coordinator. Student must demonstrate financial need. (FAFSA)

The Nancy Topping Bazin Scholarship was established by the Friends of Women's Studies to assist a graduate student in women's studies.

***The John R. Burton Jr. Scholarship** is made possible by an endowment given by John R. Burton Jr. This scholarship assists students who demonstrate financial need. Preference is shown to high school graduates who have been reared in the Hope Haven Children's Home. (FAFSA)

***The Robert Claytor Memorial Scholarship** is funded by an endowment from the friends of Robert Claytor for a student who demonstrates financial need, according to federal needs analysis. (FAFSA)

***The Delta Sigma Lambda-Dr. Ruth Harrell Scholarship** is supported by an endowment to assist women who have received a bachelor's degree and are full- or part-time graduate students enrolled at Old Dominion University. Selection is also based upon scholastic ability, financial need and good personal character. Preference is given to those students who have lived in the Commonwealth of Virginia for at least one year. Students must also complete a separate application, which is available in the Old Dominion University Women's Center. Delta Sigma Lambda members are eligible for the award. (FAFSA) (757) 683-4109.

The Charles H. Eure Memorial Scholarship is awarded to a marine science or engineering student who has a 3.00 grade point average and is of sound moral character. Preference will be given to a STASR (South Tidewater Association of Ship Repairers) company family member.

***The Lillian Vernon Endowed Scholarship** is funded by an endowment from the Lillian Vernon Foundation. It is awarded to a spouse, child, or grandchild of an active Lillian Vernon employee. Recipient must have a minimum grade point average of 2.80 and demonstrate financial need. (FAFSA)

The Memorial and Recognition Scholarship Fund is an endowed scholarship that will be awarded to a student with a minimum grade point average of 3.00 and is able to demonstrate involvement in community service.

The Meredith Construction Company Scholarship is made possible by an endowment given by the Meredith Construction Co. Inc., Meredith Realty, et al. and members of the Meredith family. The award is given to a graduate student demonstrating academic merit in his/her chosen curriculum.

The Steve Russell Morrison Memorial Endowed Scholarship has been established by the family of Steve Russell Morrison and the Epsilon Beta Chapter of Kappa Delta Rho. This scholarship is awarded to a rising sophomore demonstrating leadership and involvement in campus and community affairs. Preference is given to active members of the Epsilon Beta Chapter of Kappa Delta Rho. (ESSAY)

***The Sherwood/Portsmouth Scholarships** are funded annually by a trust established by the late Calder Sherwood III, a professor emeritus in the departments of Chemical Sciences and Physics/Geophysical Sciences. Professor Sherwood served on the Old Dominion University faculty for 38 years. The scholarships are awarded to graduates of public high schools in Portsmouth, Virginia who demonstrate financial need. (FAFSA)

The Town-N-Gown Scholarship has been established by Town-N-Gown, an association dedicated to promoting cooperation between the Hampton Roads community and the University in order to promote better understanding in fulfilling the aims and ideals of each. The scholarship recipient rotates annually from the following: (1) resident of the greater Hampton Roads area, (2) a member of or dependent of active duty military personnel, and (3) a dependent of an Old Dominion University faculty or staff member.

The Hugh L. Vaughan Scholarship has been established by an endowment made by Mr. Hugh L. Vaughan to assist handicapped students. Preference is given to blind students. Recipients must be native-born Virginians.

***The E. C. Wareheim Foundation "Returning Women's" Scholarship** has been established by an endowment to assist one or more returning women from Norfolk, Virginia Beach, Portsmouth, Chesapeake, or Suffolk who have demonstrated financial need. Preference is given to students who enroll part-time. (FAFSA)

***The Jane L. and Robert H. Weiner International Affairs Scholarship** is made possible through an endowment established by Mr. and Mrs. Weiner to assist a student who will be studying abroad through the International Student Exchange Program (ISEP). Preference will be given to students who will study in a Third World or developing country for the purpose

of fostering international understanding and peace and who demonstrate academic achievement and financial need. (FAFSA)

***The Calvert S. Whitehurst Scholarship** is funded by an endowment established by Mr. Robert B. Kendall and augmented by the Whitehurst Scholars Scholarship Foundation. The endowment recognizes the contribution of both Mr. Calvert S. Whitehurst and his son, Professor G. William Whitehurst, former member of the U.S. Congress. The scholarship is awarded to a student with financial need who demonstrates academic potential. (FAFSA)

The Linda Hyatt Wilson Graduate Scholarship in China Studies was established by Linda Hyatt Wilson to award one scholarship to a full-time graduate student who has a 3.5 grade point average, demonstrates financial need, and is involved in the study of China's culture, history, economy, politics, or foreign relations.

The Anita Clair Fellman Endowed Service Learning Scholarship is funded by an endowment established by Dr. Carolyn H. Rhodes to assist one or more full time or part-time graduates, or undergraduate students who participate in a service-learning project through the Department of Women's Studies. The recipient will be selected by the chair of the Women's Studies Department and another Faculty member in the department.

Other Financial Aid Resources

The Parker Lesley Endowed Fund has been established for students who demonstrate need for special circumstances. Special circumstances are defined as emergency travel, supplies, equipment, etc. (ESSAY) (757) 683-6856.

The James Stamos Scholarships in Voice and Piano are made possible by a bequest from Mr. Stamos to assist several students who are majoring in either voice or piano. Information concerning audition requirements is available from the Music Department. Contact Mr. Dennis Zeisler, chair of the department. (AUDITION) (757) 683-4061.

The Student Activities Scholarships in music are awarded to students who participate in one or more Music Department activities including concert choir, band, orchestra, Madrigal Singers and brass choir. Information concerning audition requirements is available from the Music Department. Contact Mr. Dennis Zeisler, chair of the department. (AUDITION, PARTICIPATION) (757) 683-4061.

The Viburnum Acting Endowed Scholarship Fund was established by the Viburnum Foundation to provide monetary awards to acting students. (AUDITION) (757) 683-3608.

The Institute for Learning in Retirement Scholarship is a two-year scholarship established by the Institute for Learning in Retirement for a student of any discipline who demonstrates financial need, has a baccalaureate degree, is a resident of Hampton Roads, and has a 3.00 grade point average. (757) 368-4160.

The ODU Credit Union Scholarship has been established for members of the ODU Credit Union or their dependents. The applicant must be an admitted Old Dominion University student in good standing or a candidate with worthy credentials. An application, transcripts, and a short (250 word) essay are required. (757) 533-9308.

The Monarch Athletic Bands Endowed Scholarship was established by Old Dominion University Educational Foundation. The recipient (s) must be a full-time undergraduate or graduate student, successfully completes an audition, and must maintain a minimum GPA of 2.5 for an undergraduate student or minimum GPA of 3.0 for a graduate student.

The Donald K. Marchand Sigma Nu Endowed Scholarship was established by Darden Watkins Jones, Jr. and Richard R. Early to assist undergraduate or graduate student(s) who are enrolled full-time or part-time, have a minimum cumulative GPA of 2.7, and must demonstrate involvement in the community, campus and fraternity. Preference will be given to active members of Sigma Nu Fraternity.

The Prabhav Maniyar International Exchange Program Scholarship was established to assist a full-time international student with particular

preference to students from the nation of Kenya and the Sudan. Recipient must maintain a cumulative grade point average of 3.0 or better.

Veterans and Dependents Benefits

Information about the administration of education assistance under the Veterans Administration may be obtained from the VA website: www.vba.va.gov (<http://www.vba.va.gov>). Students wishing to use their VA benefits at Old Dominion University may find further information on the University Registrar's web page: <http://www.odu.edu/webroot/orgs/AF/REG/registrar.nsf/pages/MSS+Home>.

Contact Military Student Services staff in the Office of the University Registrar for further assistance by phone: 757 683-4425; by FAX: 757 683-5865; or by email to register@odu.edu.

Termination of Aid

Failure to remain in good academic standing will result in automatic withdrawal of financial aid by the University. Failure to comply with the conditions of a financial award will cause its termination and the return of any unexpended funds as well as repayment, in some cases, of funds already utilized. Undergraduate specific endowed scholarships will be withdrawn immediately for the term in which an undergraduate student's classification advances to an admitted graduate student status.

Financial Awards

Financial awards are determined by the graduate program and college dean following the policies and guidelines described below. For specific qualifications, conditions, amounts, length and types of awards, contact the appropriate graduate program director.

Graduate Assistantships

A. Nature of the Graduate Assistantship

The graduate assistant is expected to participate directly in either instructional, research, or administrative duties in support of the ongoing activities of the University's academic, research, and service units.

It is the University's intention to make the assistantship an integral and valuable part of the student's graduate education. It should be viewed as an apprenticeship in teaching, research, or administrative service.

B. Categories of Graduate Assistants

1. **Graduate Teaching Assistant (GTA)** - participates directly in teaching activities, such as the teaching of a course, holds responsibility for a laboratory section, or is assigned to specific instructional support or related activities. The University recognizes two levels of graduate teaching assistant responsibilities and activities, i.e., the Instructor Level GTA and the Assistant Level GTA.
 - GTA Instructors directly communicate and interact with students in ways that lead to the conveyance of knowledge or skills required to successfully complete the course. Included in this category are graduate students who serve as instructors, laboratory supervisors, recitation leaders, and tutors.
 - GTA Assistants do not directly instruct students in the knowledge or skills imparted by the laboratory experience, instead, TA Assistants serve as graders, help the instructor research articles and materials to be used by the instructor in preparing lectures or handouts, or as laboratory assistants who prepare equipment solutions, etc.
2. **Graduate Research Assistant (GRA)** - participates directly in research or support activities conducted by faculty members or administrators. There are three sources of funding for GRAs: those funded through Commonwealth sources, those funded by local funds, and those whose stipends are paid by the Old Dominion University Research Foundation (ODURF) from grants and contracts.
3. **Graduate Administrative Assistant (GAA)** - participates directly in the support of the activities of a University administrative unit (e.g. student services or athletics).

C. Graduate Teaching Assistant Instructor Institute (GTAI Institute) Requirement

1. All GTA-Instructors will be required to successfully pass the GTAI Institute in order to receive a GTA stipend. GTA Assistants are not required to pass the GTAI Institute but must be approved and supervised by the appropriate faculty instructor.
2. The Institute is offered twice a year during the week before fall and spring classes begin. All graduate assistants, including those who have research and/or other non-instructional assignments, are encouraged to participate in the Institute in anticipation of future teaching assignments. The institute is comprised of the University portion and the college portion. Students are required to attend both portions to pass the Institute. Departments are encouraged to develop their own on-going programs for training graduate teaching assistants. Such programs should be tailored to the specific needs of the discipline and department policies.

D. Application

Application forms for graduate assistantship stipends paid by the University (GTAs, GRAs, and GAAs) are available from the Office of Admissions or from the University's web page. The completed form, together with a brief essay by the applicant discussing academic interests and career objectives,

must be submitted to the appropriate graduate program director or office making the appointment, as soon as possible for fullest consideration. Applications for GRA positions funded through ODURF are made through the faculty member who is the principal investigator, the department chair, or graduate program director.

E. Eligibility

1. Only students admitted to graduate degree programs in regular or provisional status on the basis of complete and fully evaluated credentials and in good academic standing are eligible for appointment to a graduate assistantship. Additional criteria apply for appointment as a graduate teaching assistant (GTA) (see section on appointments).
2. All students appointed to a graduate assistantship are required to verify their identity and employment eligibility and complete an I-9 Form, according to University procedures, prior to commencing their duties. This requirement is established in order to comply with the Immigration Reform and Control Act of 1986. Students are also required to complete the Child Support Disclosure and Authorization Form, the Commonwealth of Virginia's Policy on Alcohol and Other Drugs Form, ODU Use of Electronic Communications and Social Media Form, the Commonwealth of Virginia Selective Service Form, and the Employee Payroll Direct Deposit Authorization Form.
3. Students who are not in good academic standing are ineligible to hold an assistantship. **Assistantship appointments will be terminated for any student whose GPA is less than 3.0.**

F. Enrollment Requirements

There are two categories of enrollment requirements:

1. Graduate Teaching Assistants and Graduate Administrative Assistants are required to be enrolled each fall and spring semesters of their appointment and must register for and complete a minimum of **nine** hours of graduate course work per semester and **three** hours in the summer.
2. Graduate Research Assistants are required to be enrolled each fall and spring semesters of their appointment and must register for and complete a minimum of **six** hours of graduate course work per semester and **three** hours in the summer.

For administrative purposes, Graduate Research Assistants will be paid from non-S5 funds. Graduate Teaching Assistantships and fellowships paid from University accounts other than Ledger 1 accounts must register for and complete a minimum of six hours of graduate course work per semester and three hours in the summer.

All doctoral students (regardless of their funding source) who have successfully advanced to candidacy and only need to complete the dissertation must register for at least **one** hour of graduate credit every semester until graduation (see Continuous Enrollment Policy in this Catalog.) Students who have advanced to candidacy and are enrolled for one credit are eligible for full tuition exemption. The graduate form, Doctoral Candidates 1-Hour Full-Time Notification, must be completed and forwarded to Student Employment in the Office of Finance. Master's students holding graduate teaching, research, or administrative assistantships who are in their final semester and who are within six hours of completing their degree requirements may register for six or fewer graduate credit hours needed for the completion of their degree. Those who are completing a Master's Thesis or Master's Project but have not yet defended it may register for one hour of graduate credit in their final semester. Such students will be considered full-time. Master's students are eligible for reduced enrollment requirement for no more than one semester.

Students are required to complete all of the credit hours as listed in the individual department sections necessary for the degree. Undergraduate prerequisite courses and courses taken for audit are not normally counted toward the enrollment requirement, except upon the recommendation of the program director, department/school chair, and the dean of the appropriate academic college.

- Graduate assistants normally may not enroll for more than nine credit hours per semester. Enrollment for 10 to 12 credit hours requires the

approval of the appropriate program director. No graduate assistant will be permitted to enroll for more than 12 credit hours in any semester an appointment is held.

- The Board of Visitors has authorized the president or his or her designee, to consider waivers related to the minimum enrollment requirements specified above.

G. Appointment Process

1. Assistantships in Departments/Schools

The dean or other appropriate administrators notifies the individual departments/schools or units of their allocation of assistantships for the coming year.

- a. The department/school recommends candidates for the assistantships to the appropriate academic dean. Candidates should be interviewed before final recommendations are made for appointment. Particular care should be taken in the consideration of applicants to determine the adequacy of academic preparation and language skills. A completed E-1S form or ODURF Form 108 for all graduate assistant appointments will accompany the candidate's nomination to the dean or administrator. All completed E-1S forms with award letters, acceptance forms and job descriptions are to be sent to the Office of EIS Processing for processing. ODURF 108 forms are to be sent to the Old Dominion University Research Foundation. Prior to submission of a nomination, the department/school should determine whether the student has been nominated for or accepted another graduate assistantship.
- b. Nominations are reviewed and approved by the dean of the academic college or his/her designee to insure that applicants meet the eligibility criteria for appointment, such as admission to a degree program, English language proficiency requirements, good academic standing, and enrollment, and that the appointment is in compliance with applicable University and college policy.
- c. Applicants for GTA appointments must demonstrate written and oral fluency in the English language. For international students, a good command of written English will be evidenced by acceptable TOEFL scores and required entrance essays. Oral proficiency in English will be determined through the SPEAK test administered by Old Dominion University's English Language Center personnel. A passing score on the SPEAK test is 50. Students who marginally fail the SPEAK test with a score of 45 will be offered the opportunity to participate in a re-test as a part of the GTAI Institute to determine if face-to-face communication is sufficient for holding a teaching assistantship.

2. Assistantships in Non-Departmental Units

- a. Each non-departmental unit, e.g., Career Management Center, Athletics, Registrar, submits to the Office of Graduate Studies a position description for each Graduate Administrative Assistant (GAA) position available within their unit. Along with the position description the unit will provide a list of those graduate programs in which students have or are proposed to have the interest and skills required. The position must require and provide an academically and programmatically appropriate level of intellectual and professional activity. If the position description is approved, the department chair and graduate program director will coordinate with the non-departmental unit the selection of academically qualified and highly ranked students from their current or to-be recruited graduate students. The appointment of the GAA is made jointly by the academic and non-departmental administrative departments.
- b. Determination of the number and the availability of funds must be done as early as possible in order to facilitate offering these GAA positions to the top ranked applicants/students in the appropriate graduate programs. As part of the December - January budget submission process, non-departmental units must submit a justification for continued and increased support of GAAs, i.e., stipends and tuition waiver.
- c. Each semester, the GAA's immediate, non-departmental supervisor will evaluate the performance of the student and make recommendations for continuance or termination. This written

evaluation will be reviewed by the graduate student and his/her GPD or academic advisor and a final set of recommendations made regarding continued awarding of the assistantship.

H. Appointment Workload

Graduate assistantships require 20 hours per week of service and are generally made for a period of one academic year with a nine-month performance period. For a GTA (instructors and administrative assistants), the work load should include no more than six hours of classroom teaching or nine contact hours of laboratory supervision per semester, plus normal preparation time.

Nominations should be submitted at least 30 days before the semester of employment in order to assure adequate time for processing. A graduate assistant funded through a grant or contract may be appointed for shorter periods if required by the conditions of the grant or contract.

An assistantship workload (20 hours per week) may be divided between teaching and research duties with the approval of the dean of the appropriate academic college. A graduate assistant appointment may be renewed upon nomination, review of qualifications, and satisfactory previous performance.

I. Additional Employment

Full-time (20 hours per week) graduate assistants are not permitted to accept additional on-campus employment during the period of their assistantship. In particular, graduate assistants (graduate teaching assistants, graduate research assistants, and graduate administrative assistants) may not be paid for part-time teaching or other campus employment for the University in addition to their normal responsibilities. Exceptions to this policy may only be made under unusual circumstances and only with the approval of the dean of the appropriate college or equivalent administrator upon the written recommendation of the graduate program director and the department/school chair. Any outside employment (i.e., off-campus) should be undertaken with caution and in consultation with the GPD. It should in no way adversely affect academic performance or assistantship duties and responsibilities. Information on employment guidelines that are specific to international students may be obtained in the Office of International Student and Scholar Services.

J. Evaluation and Monitoring

All graduate assistants shall be provided with a written job description of their responsibilities, and be evaluated at least once by their supervisor(s) during the period of the award, preferably before the end of the first semester of service is completed. The evaluation shall be discussed with the assistant and a copy forwarded to the appropriate graduate program director, or chair.

K. Termination

A graduate assistantship normally ends when the period of appointment is concluded and the terms of the assistantship agreement are fulfilled. Otherwise, a graduate assistant may be terminated for the following reasons:

1. Resignation by the student. Resignation shall be in writing to the supervisor with a copy to the appropriate department chair, program director, and academic dean or equivalent administrator.
2. Failure of the student to perform his or her assigned duties adequately. Termination must be recommended by the student's supervisor and approved by the department chair, graduate program director, and the appropriate academic dean or equivalent administrator.
3. Failure of the student to remain in good academic standing in accordance with the graduate continuance regulations.
4. Failure of the student to maintain enrollment in the requisite number of graduate credits.
5. Expiration of a grant or contract that funds the student's stipend.
 - a. Any overpayment must be reimbursed to the University by the student as soon as possible after termination. Failure to repay the amount owed may result in legal action against the student for recovery.
 - b. If a student resigns from an assistantship or is terminated for reasons other than the completion of the appointment or

expiration of the funding contract, the department chair or graduate program director should notify the appropriate academic dean or administrator as soon as possible and nominate a replacement if necessary.

- c. A student who believes that he or she may have been unjustly terminated may appeal the decision. First, the student should meet with the supervisor, graduate program director, and department chair in an effort to resolve the situation. If this effort fails, the student may make an appeal in writing to the dean or administrator of the appropriate academic college. If the matter is not resolved, it will be referred to the Office of Graduate Studies and then be automatically refer the matter to the Graduate Appeals Committee for review. The decision of the Appeals Committee is final.

L. Grievance Procedure

Should a graduate assistant believe that his/her assigned duties and/or the workload required to fulfill these duties do not conform to university graduate catalog policies, he/she should first attempt to reconcile the grievance with his/her academic/nonacademic immediate supervisor. If the grievance is not resolved, the graduate assistant will ask his/her graduate program director (GPD) to mediate the grievance between him/her and the immediate supervisor. If the GPD is the student's immediate supervisor, the GPD chair/dean's designee will attempt to mediate. If the chair is the student's supervisor, the GPD shall refer the case directly to the dean or the dean's designee. If this course of action does not resolve the grievance, the GPD/chair/dean's designee will seek mediation with the supervisor of the student's immediate supervisor. If a resolution cannot be achieved, the chair/dean's designee will appoint an ad hoc committee comprised of two senior faculty members from the student's department and one senior faculty member from another department. If the student's assistantship is a non-academic unit, the third member will be a senior level administrator from the nonacademic unit. Should the committee not resolve the grievance, it will be referred to the dean of the student's college for a final decision. For matters involving sexual harassment and/or discrimination, please see the "Sexual Harassment Policy and Procedures" or the "Discrimination Complaint Procedure" in this catalog.

M. Recognition of Graduate Teaching Assistant Performance

Each academic year, two graduate teaching assistants will be recognized for their outstanding performance as a classroom or laboratory instructor. Recipients of the Outstanding Teaching Assistant Awards will receive a \$1,000 financial award to be used to support their educational expenses. A request for nominations and criteria is distributed by the Office of Graduate Studies.

Graduate Fellowships

Fellowships are awards granted for scholastic achievement and promise. Their objective is to enable full-time students to pursue graduate studies and research leading to advanced degrees without requiring them to render any service. Part-time and/or nondegree students are not eligible. Fellows are responsible for payment of their tuition, in- or out-of-state, as applicable.

University fellows are chosen by their graduate programs and are supervised by their colleges. Applicants should indicate their intent to apply for a fellowship when applying for admission. Letters of recommendation, current transcripts, and any additional evidence of scholastic achievement that would assist in an evaluation of the student should be on file in the Admissions Office.

Tuition Grants

Tuition grants may be offered to full-time regular or provisional degree-seeking graduate students. Part-time tuition grants may also be available for Virginia residents. Applicants should indicate their desire to apply for tuition grants when applying for admission. Students holding tuition grants who withdraw from courses will be held personally liable for repayment of funds utilized. Students receiving tuition grants must be registered for nine graduate credits each semester and six in the summer.

Tuition Waivers

Graduate students who are awarded a fellowship or who are employed as graduate assistants may receive partial to full tuition assistance. The decision as to whether a student receives partial or full tuition is made by the students' academic program.

Minimum Stipend Levels

In compliance with federal guidelines a graduate student must receive a minimum of \$3,200 in assistantship or fellowship support for the fall and spring semesters and a minimum of \$2,500 during the summer.

Supplements to the minimum stipend amount can be made based upon the availability of funds and upon approval of the appropriate dean and the funding agency. The stipend is considered to be taxable income since it is payment for services.

Return of Tuition Assistance

A student who completes less than half of the assistantship or fellowship appointment will be required to return his/her full tuition assistance award to the university.

Graduate Policies & Procedures

Attendance Policy

Regular classroom attendance is expected of all students and individual faculty may require class attendance. Course grades reflect not only performance on written assignments and exams, but also participation during class periods. As discussions cannot be reproduced, many times absences cannot truly be made up. Excessive absences therefore have a negative effect on the student's learning and performance. Students are responsible for all class work, and a student who misses a class is expected to have the initiative necessary to cover properly the material missed. Students must meet all course deadlines and be present for all quizzes, tests, and examinations.

Syllabus information will include a statement of the attendance policy for each course and the effect of nonattendance on grades. Reasonable provisions should be made by the instructor for documented representation at University-sponsored athletic or academic functions, mandatory military training and documented illness. The granting of provisions for other documented absences is left to the discretion of the faculty member.

Due to the nature of asynchronous courses, students are expected to participate in class, but in formats that may not require attendance at regular intervals.

Extended illness. The student should notify the Office of Student Ombudsperson Services (S.O.S.) when the student is going to be absent from classes for more than one week because of an illness. Student Ombudsperson Services will notify the student's course instructors of the absence on his or her behalf.

Class Attendance by Guests

Statement: The propriety for non-student presence in the classroom will vary dependent upon the nature of curricular offerings, dangers inherent to certain classrooms and labs, the optimum classroom environment for each class, and the preferences of each instructor. Guidelines specifying whether non-student guests will be permitted in the classroom, which are consistent with departmental policy, will be established for each class by the instructor and included in the syllabus for the course. These guidelines will apply to each site at which the class is offered.

Continuous Enrollment Policy

Master's, Education Specialist, and Pre-candidacy Doctoral Students. Students who have completed all course work but are working during a given semester to complete other outstanding degree requirements (e.g. comprehensive examination, thesis, removal of an I or II grade) or wish to use University facilities and/or consult with faculty must be registered for at least one credit during that semester. In addition, graduate students must be registered for at least one credit hour in the semester in which they graduate. The program designated 999 course may be used to fulfill this requirement.

Registration for the required program designated 999 course is subject to the normal fees and regulations of the University.

Doctoral Students After Advancement to Candidacy. After successful advancement to candidacy, all doctoral students are required to be registered for at least one graduate credit hour each term (fall, spring, and summer) until the degree is completed, including the semester in which they graduate. Failure to comply with this requirement will result in charges to the student's account for one graduate credit hour plus required fees for each semester after advancement to candidacy. Students are not eligible for graduation until all charges are paid.

Master's Degree Seeking Students with Assistantship Appointments in Their Final Semester. Master's students holding graduate teaching, research or administrative assistantships who are in their final semester and who are within six hours of completing their degree requirements, may register for six or fewer graduate credit hours needed for the completion

of their degree. Those who are completing a Master's Thesis or Master's Project but have not yet defended it, may register for one hour of graduate credit in their final semester. Such students will be considered full-time. Master's students are eligible for reduced enrollment requirement for no more than one semester.

Additional Graduate Degrees Policy

Graduate students may pursue an additional graduate degree in any discipline at Old Dominion University. Students may request that graduate level course work used to fulfill requirements for one ODU graduate degree be applied to another graduate program. Such a degree may be sought subsequent to or concurrently with another degree. Approval of the graduate program directors and appropriate college deans is required.

Policy on Nondegree Credits to Complete a Degree

No more than 12 credit hours of graduate-level course work taken at Old Dominion University as a nondegree student may be applied toward a graduate degree or certificate. These 12 credit hours may include only coursework for which grades of B or higher are earned. These credit hours are in addition to the 12 credit hours that can be transferred from other institutions and through experiential learning.

Graduate Writing Proficiency

Each graduate department or program will develop specific policies and procedures for evaluating and, if necessary, upgrading student writing.

Graduate Pass/Fail

Master's-level students may include pass/fail-graded experiences to fulfill a portion of their program requirements provided that they meet a University requirement of 24 credit hours of course work, of which at least 18 hours must be letter-graded course work, and any additional departmental or school requirements. The college, school and/or department administering the program shall determine which student course work shall be considered for pass/fail credit.

Doctoral students must take dissertation credit as pass/fail and may select from among the designated pass/fail-graded experiences a portion of their program requirements, provided that they take a minimum of 24 credit hours of letter-graded course work, of which at least 18 hours must be letter-graded course work, beyond the master's degree, or equivalent, and meet any additional departmental or school requirements.

Deans may, at their discretion, designate courses as pass/fail, letter graded or both.

A student electing the pass/fail option for a particular course cannot change his or her registration and elect to take the course for grade point credit after the end of the "add" period. Similarly, courses cannot be elected as pass/fail after the end of the "add" period.

Graduate Policy on GPA and Course Credit Following Separation and Readmission to the Institution

Students newly admitted to a graduate program following six or more continuous years of separation from the University may apply to have all previous course grades and credits removed from the calculation of GPA in the new degree program.

Students who wish to apply must complete the Policy on GPA Following Separation Form and have it approved and signed by the graduate program director, the department chair, and the college dean before submitting it to the Office of the University Registrar.

If approved, all previous graduate courses and grades will remain on the transcript but will not be used in calculating the GPA for the new graduate degree program.

Declaration or Change of Major or Program

A provisional or regular graduate student who wishes to change to a program other than the one of original admission must make the request in writing to the main campus Admissions Office or to his/her site director. The student's graduate record will be examined to ascertain what, if any, other supporting credentials must be submitted (e.g., test scores, letters of recommendation) prior to consideration for admission to the new program. If it is determined that no other supporting credentials are necessary, the student's record will be submitted to the graduate program director of the new program, with a request for consideration of admission. The student will be notified in writing of the decision. If not admitted to the new program, the student will be retained as a provisional or regular student in the original program.

When the new program requires other and/or additional supporting credentials, the student must submit these before consideration can be given to the change.

Credits earned toward a degree or certificate for the original program may or may not be accepted by the director of the new graduate program. All grades earned in the original program remain on the student's transcript but only grades of B or higher are used to compute the GPA in the new program.

Conversion from Doctoral to Master's Program

A student in a doctoral program may be converted to an appropriate master's program in special situations. The doctoral student making satisfactory progress but wishing to leave the University may apply in writing to the new master's program director, with copies to the current program director and the applicant's committee. The new program director, in consultation with the current program director, will review the request following program policy and procedures.

In the case where a doctoral student fails to pass or complete a particular degree requirement, the student's committee may recommend the student to a master's degree program. The student will follow the procedure outlined in the preceding paragraph, except that this approach requires supporting documentation from the current committee.

Once the student is accepted, the new program director will send a memorandum and a Notice of Change of Status Form, to the Office of the Registrar. The memo should clearly note which of the Old Dominion University credits and approved transfer credits may be applied to the master's degree, and which, if any, should be reserved for future doctoral work.

Normal Course Load

Every graduate program of study requires prior approval of the graduate program director or the approved faculty advisor. The minimum load for a full-time graduate student is nine graduate credit hours per semester. No more than 12 credit hours may be carried, except in unusual circumstances and with the permission of the graduate program director. In summer sessions, six credit hours constitute a full load.

Unsupported graduate students registered for fewer than nine credit hours during regular semesters or fewer than six credit hours in summer sessions are classified as part-time graduate students. During regular semesters, six credit hours is considered three-fourths time, four credit hours is half-time, and three credit hours is quarter-time. During the summer term, four credit hours is considered three-fourths time, three credit hours is half-time, and one hour is quarter-time.

For students that are appointed as teaching, administrative, or research assistants, there are two categories of enrollment requirements:

1. Graduate Teaching Assistants and Graduate Administrative Assistants are required to be enrolled each fall and spring semesters of their appointment and must register for and complete a minimum of nine hours of graduate course work per semester and three hours in the summer.

2. Graduate Research Assistants are required to be enrolled each fall and spring semesters of their appointment and must register for and complete a minimum of six hours of graduate course work per semester and three hours in the summer.

For administrative purposes, Graduate Research Assistants will be paid from non-S5 funds. Graduate Teaching Assistantships and fellowships paid from University accounts other than Ledger 1 accounts must register for and complete a minimum of six hours of graduate course work per semester and three hours in the summer.

Doctoral assistants who have successfully advanced to candidacy and need only to complete the dissertation, must register for at least one hour of dissertation (899 or 999) every semester through graduation. Master's assistants in their final semester and who are within six hours of completing their degree requirements, may register for six or fewer graduate credit hours needed for the completion of their degree. Those who are completing a Master's Thesis or Master's Project but have not yet defended it, may register for one hour of graduate credit in their final semester. Such students will be considered full-time. Master's students are eligible for reduced enrollment requirement for no more than one semester.

Course-Load Distribution

Graduate students should take care that the major portion of their course work is selected from 600- and 700-level offerings in pursuit of the master's degree and from 800-level offerings for an education specialist or doctoral degree. At least three-fifths of the course work must be completed at these levels, and some programs have instituted more stringent requirements. Reference should be made to the appropriate section herein, and individual questions concerning the course-load distribution should be directed to the advisor.

Submission of Written Work To More Than One Class

In general, it is not acceptable for a piece of work such as a term paper to be submitted to more than one class for credit. In cases where submission of the same paper is appropriate, prior approval must always be obtained.

An example of a situation in which the same paper might appropriately be submitted would be one in which a student was enrolled in two classes, in both of which a given research topic was not only of interest to the student but was completely appropriate to both classes. In such circumstances, the student would approach the instructors of the two classes and obtain approval to submit the same term paper to both classes, based on prior agreement concerning the depth of the study, amount of material covered, and the length of the paper to be submitted (which should be longer than a paper submitted to one class).

Re-Validation of Out-of-Date Graduate Credit

Academic credit granted outside the time limit established for graduate degrees (six years for master's and education specialist degrees and eight years for doctoral degrees) must be re-validated by an examination before the work can be applied toward the requirements of a degree program.

To be re-validated, the work must have been completed at Old Dominion University or be acceptable as transfer credit in lieu of an Old Dominion University course.

The following procedure shall be used to re-validate out-of-date work:

1. The student must receive the permission of his or her graduate program director and the chair of the department/school or dean of the college in which the course is offered to validate the course credit. The form for re-validation of out-of-date credit shall be used to record all transactions and must be submitted to the Registrar's Office upon completion of validation of work.
2. The graduate program director, department/school chair or dean shall make appropriate referrals to faculty member(s) (an individual or a committee) teaching the course to request that an examination be

prepared and evaluated. Before the examination, the faculty member(s) shall inform the student of the area of knowledge or course content on which he or she is to be examined.

3. After the examination has been completed, the validation form shall be filled out, signed by the examining faculty member(s), and forwarded to the dean of the academic college offering the graduate degree program for approval.
4. Copies of the completed form shall be sent to the student, the graduate program director, and the university registrar.
5. Re-validation for any given course can be sought only once.

Final Examinations

The University firmly believes that a comprehensive evaluation of a student's achievement in a course is a vital part of the educational process. Final examinations, if given, are to be given at the time and in the location given on the Registrar's Office website at www.odu.edu/registrar. Upon request of the instructor, exceptions to this regulation may be made only by the dean.

In the event that a final examination is changed to other than that of the scheduled time, provisions will be made by the instructor for any student who cannot comply with the schedule change.

Any student who has three examinations scheduled in one calendar day and is unable to resolve the problem informally with the instructor or instructors may petition the dean for relief.

All examinations are to be retained for one year by the faculty members. Students have the privilege of requesting conferences with the instructors in regard to their final grades.

Students enrolled in asynchronous, video streaming, CD-Rom, or like courses that may not follow the traditional semester timetable will be required to adhere to the examination schedule set by the professor. In addition, students not associated with a distant learning site, higher education center, or with main campus will need to secure a proctor to administer all tests, quizzes, and final exams. A postal fee will be incurred by the student for this service. For more information on proctoring, contact the Office of Distance Learning at 1-800-968-2638.

Probation and Suspension (Continuance)

The requirements and regulations set forth are to be construed as the minimal requirements established by the University. Students also are obligated to meet all additional requirements established by the appropriate graduate program.

Students who believe the probation or suspension was due to an error in a grade assigned should contact the Office of the University Registrar.

Degree Seeking Students

At the end of each semester-fall, spring, and summer- the records of students who do not maintain a 3.00 cumulative grade point average (GPA) are reviewed. Students who do not have a cumulative GPA of at least 3.00 will be placed on probation.

Probation/Suspension Policy

Graduate students on probation will have 12 credit hours to raise their cumulative GPA to 3.00. If they fail to achieve a cumulative GPA of 3.00 after completing the next 12 credit hours, they will be placed on indefinite suspension and prevented from enrolling in graduate courses. This does not affect the student's status with regard to undergraduate courses.

Reinstatement Policy

All conditions must be satisfied before reinstatement is authorized:

1. The student is responsible for initiating each of the following aspects of the request for reinstatement to the university:
 - a. Developing a plan of study in consultation with and approved by the appropriate Graduate Program Director (GPD) of the program that the student is seeking to either continue enrollment or to be newly admitted. The plan of study must specify the initial 12 credit

hours to be taken and the steps necessary to complete the degree requirements within the six-year (master's) and the eight-year (doctoral) time period as required by University policy. This plan should recognize that all prior courses in which grades of B- or less were earned must be repeated or replaced with an approved substitution. If reinstated, the student's GPA will revert to 0.00 and courses with a grade of B or above will be treated as internal transfer credit and therefore will have no bearing on the GPA. Upon reinstatement, the student must achieve a cumulative GPA of at least 3.00 in the next 12 credit hours of graduate credit attempted.

- b. Providing to the GPD a written explanation and documentation of the factors and circumstances that contributed to the failure to achieve the academic standards as well as evidence that these issues have been resolved. Students who wish to maintain confidentiality regarding special medical or other personal issues, must obtain a letter from the division of student engagement and enrollment services certifying their validity and contribution to the suspension and that these issues have been or will be satisfactorily resolved prior to the reinstatement.

2. The GPD is responsible for each of the following steps of the request for reinstatement:

- a. Reviewing the student's letter and any written documentation the student provides, assisting in the development of the proposed plan of study, and assessing the student's potential for successful completion of the program.
- b. Assessing the potential impact of reinstatement on departmental resources.
- c. Submitting a recommendation on the student's request to the department chair. Note: (The GPD and the chair must agree for the student to be reinstated at the department level.)

3. If reinstatement is approved, the student will be informed in writing and the steps outlined in 1.a. and 1.b. of this policy shall be followed. A copy of the letter and the approved plan of study shall be forwarded to the Office of Graduate Studies. The Office of Graduate Studies will work with the Office of the Registrar to ensure the academic record is updated so the student may resume his or her study.

4. Upon reinstatement:

- a. All courses with grades of B- (2.70) or below will be dropped from consideration in the calculation of the grade point average for continuance or graduation. These grades will remain on the student's transcript, but the courses will not be counted toward the degree.
- b. Courses with grades of B or above may be counted toward the degree but they will not be used in the calculation of the GPA.
- c. Reinstated students must achieve a cumulative GPA of at least 3.00 upon completion of the next 12 hours of credit attempted. Subsequent performance will be monitored by the GPD.

5. If the student's request for reinstatement is denied the student must be informed in writing. A copy of the letter shall be forwarded to the Office of Graduate Studies along with original materials submitted by the student. The student has the right to appeal the decision to the Graduate Appeals Committee. The student must resubmit the written letter and documentation as outlined in 1.a and 1.b to the Graduate Appeals Committee.

6. The Graduate Appeals Committee will request a written evaluation from the GPD. The GPD's evaluation must address the reasonableness of i) the proposed plan of study; ii) the potential for successful completion of the program, and, iii) the potential impact of reinstatement on departmental resources.

7. The Graduate Appeals Committee will render its decision and inform the Office of Graduate Studies. The Office of Graduate Studies will send a letter to the student, with a copy to the GPD, informing him or her of the Graduate Appeals Committee's decision. If the Graduate Appeals Committee supports the GPD's original decision, the student shall remain separated from the program. If the Graduate Appeals Committee approves reinstatement, the steps outlined in 1.a. of this policy shall be followed. The decision of the Graduate Appeals Committee is final.

8. A student may be reinstated only one time.

Non-degree Students

Certificate and Licensure Program Students

Probation/Suspension Policy

Students who have been permitted to pursue a certificate or licensure program must achieve a cumulative GPA of 3.00 after six or more credit hours of graduate coursework. If they fail to do so, they will be placed on probation and must raise their cumulative GPA to 3.00 within the next six credit hours. Students who fail to achieve a cumulative GPA of 3.00 after completing the additional six credit hours will be indefinitely suspended and prevented from enrolling in graduate courses. This does not affect the student's status with regard to undergraduate courses.

Reinstatement Policy

A suspended certificate or licensure student seeking reinstatement should follow the procedures outlined earlier in this policy under Reinstatement Policy for Degree Seeking graduate students.

Life-long Learners

Probation/Suspension Policy

Students who have not been formally admitted into a degree granting program, a certificate or licensure program but desire to take graduate courses are defined as *life-long learners*. Life-long learners must achieve a GPA of at least 3.00 after six credit hours. Students who fail to achieve a 3.00 after completing an additional six credit hours will be indefinitely suspended and prevented from enrolling in graduate courses. This does not affect the student's status with regard to undergraduate courses.

Reinstatement Policy

A life-long learner who has been suspended from graduate study must formally apply and be admitted into a degree program, a certificate or a licensure program before being allowed to take additional graduate courses.

Graduate Degree University Requirements

Completion of Requirements

Graduate students who complete their master's or education specialist degree requirements within six years, and doctoral students who complete degree requirements within eight years, following admission to Old Dominion University will qualify for the degree by fulfilling the requirements in the catalog in effect at the time of their first enrollment. (See military service exception under Requirements for Graduate Degrees.) Students (including part-time) who do not complete their graduate degree requirements within these time periods must project their graduation and fulfill the requirements in the catalog in effect during any of the six or eight years, respectively, preceding graduation. If a catalog other than the catalog of the year of initial enrollment is to be used, written permission of the graduate program director and dean must be obtained. Graduate students should consult their advisors to determine if any out-of-date credits may be re-validated by examination.

In all cases, students must have been duly admitted to the University and an academic program of study and meet all of the requirements for graduation in one catalog. Students may not create their own degree requirements by selecting partial requirements from more than one catalog.

Graduate Assessment Requirement

Old Dominion University has developed an institution-wide plan to assess the quality of its graduate academic degree programs. In addition, students are asked to assess their experiences with support services, University administration, and other aspects of their University experience. Students will complete the assessment at the end of their graduate degree program.

Prior to the completion of degree requirements, all graduate students must complete their assessment. Students will receive advanced notice of their eligibility to complete the measures, which may be accessed through the University's site at www.odu.edu. Failure to complete the assessments normally precludes the student's right to receive his or her graduate degree. Assessment results are used to improve student learning and the educational experience at Old Dominion University, and they do not become part of students' records. Confidentiality is assured, as only aggregate data are reported and used in analyses.

Responsible Conduct of Research Policy

1. All graduate students who were admitted or readmitted to a degree or graduate licensure program as of fall 2010 must complete the Collaborative Institutional Training Initiative (CITI) basic course. The basic course includes the following modules: Misconduct (falsification, fabrication, and plagiarism); Data acquisition, management, sharing and ownership; Mentor/trainee relationships; Publication practice and responsible authorship; Peer review; Conflicts of interest; and Collaborative research. Completion of the RCR modules will be tracked through the CITI website and is a graduation requirement. The RCR modules must be completed prior to completion of 12 semester hours. Students who fail to complete this requirement will have a registration hold placed on their records. As appropriate to their general field of study, students may complete the Biomedical Social and Behavior Research, Physical Science, or Humanities RCR track offered by CITI to fulfill this requirement.
2. All investigators conducting human subjects research protocols (both Exempt and Non-Exempt) as well as all graduate students enrolled in Thesis and Dissertation projects involving human subjects are required to complete the CITI (Collaborative Institutional Training Initiative) Program for Human Subjects Research.
3. All investigators conducting animal subjects research protocols as well as all graduate students enrolled in Thesis and Dissertation projects involving animal subjects are required to complete the LATA (Laboratory Animal Training Association) training program.

Master's Degree

This section specifies the minimum requirements for a master's degree from Old Dominion University. Some colleges, schools and departments have requirements in addition to the requirements described below. In seeking a master's degree, each master's student accepts responsibility for the following University requirements as well as any imposed by the major department.

The master's degree is awarded in recognition of the candidate's command of a comprehensive body of knowledge and ability to perform productively in the field of study. All master's degrees require a minimum of 30 semester hours of graduate credit. No more than 12 credit hours taken at other institutions may be counted toward a master's degree at Old Dominion University. All requirements for a master's degree must be completed within a six-year period. Exceptions to these time limits must be approved by the graduate program director, the college dean. Academic credits older than six years at the time of graduation must be re-validated by an examination before the work can be applied to a master's degree. See the "Policy on Re-validation of Out-of-Date Graduate Credit." Students whose graduate study is interrupted by military service will be granted an extension of time for the period of their military service, not to exceed five years.

Candidates for the master's degree at Old Dominion may have the choice of two options: the thesis option or the nonthesis option. The choice will depend upon the availability of the two options within the selected discipline, the professional interests of the candidate, and the advice and approval of the appropriate graduate program director.

Thesis Option

A minimum of 30 semester credits is required, including 24 semester credits in approved course work and six semester credits in research. The candidate is required to prepare and present a thesis or equivalent creative work. A final oral examination covering the research is required. A comprehensive written and/or oral examination covering the program of study may be required.

Nonthesis Option

A minimum of 30 semester credits of approved course work is required, including one or more courses at the conclusion of study that deal directly with special topics and/or training related to current problems or research in the discipline. A comprehensive written and/or oral examination, or an approved equivalent, on the program of study is required.

Student Advising

The Master's Degree

The graduate program director in consultation with the student, will assign a graduate advisor who must be certified for graduate instruction. An annual evaluation may include student's performance in courses, assistantships (teaching, research), the development and re-evaluation of his/her plan of study, guidance in selecting projects and mentors, preparation and scheduling of qualifying/comprehensive or equivalent exams, time management, and obtaining employment or further education. The advisor's annual evaluation and recommendation will be shared with the student and the graduate program director.

Program of Study

Prior to completion of 12 semester hours, the degree candidate is required to prepare a program of study with the guidance of the advisor. The purpose of the program of study is to ensure that the student organizes a coherent, individualized plan for the course work and research activities. The program of study is to be consistent with the requirements for the degree as described in the catalog and must be approved by the graduate program director. The successful completion of the program of study, along with the collateral reading, research, practica, etc., will enable the student to demonstrate the high level of professional competence required of all graduate students in their respective fields.

Master's Examination

A comprehensive written examination and/or oral examination, or its equivalent, is required under the nonthesis option and, depending on the program, may be required under the thesis option. The examination tests the candidate's competence in the fields covered by the program of study. The nature of the master's examination will depend on the degree sought and the requirements of the major department and examining committee. A program may propose, through the appropriate college graduate committee and academic dean, replacing the master's examination with an equivalent requirement. Such equivalent requirements shall be approved by the associate vice president for graduate studies. For further information, the student should consult the section on requirements under each degree program.

The examining committee is appointed by the graduate program director with appropriate notification to the student. The examining committee is composed of a minimum of three members who may or may not be those who serve as advisors or members of the thesis advisory committee. Members are expected to be certified for graduate instruction in the major department/school and college. This examination may not be scheduled until all major requirements have been satisfied except the final semester completion of the course work and/or the thesis.

The results of the examination must be received in the Office of the University Registrar at least two weeks prior to the end of the semester. In order to pass the final examination or approved equivalent, a master's degree candidate must have a favorable vote from a majority of the examining committee. A student who has failed the examination may repeat it once. Students who fail the comprehensive examination twice cannot subsequently elect a thesis option. At the discretion of the graduate program director, a student who passes the examination but does not graduate within twelve months may be required to repeat the examination.

Thesis Advisory Committee

The graduate program director, in consultation with the student, appoints a thesis advisory committee of at least three graduate faculty members with the backgrounds and interests necessary to counsel, direct, and evaluate the proposed research and progress toward completion of the program of study.

Nonfaculty personnel may be recommended for inclusion on a graduate thesis advisory committee. Such personnel should meet the current standards of academic training and research experience expected of faculty members serving on such committees. If the nonfaculty personnel are to be voting members of the advisory committee, approval of the inclusion of such personnel should be sought by the graduate program director through petition to the appropriate academic college dean, citing the particular advantages of such a nomination. In all cases, the committee chair must be a resident graduate faculty member.

Thesis

The candidate for the master's degree whose program of study includes a thesis is required to prepare and present a thesis (or equivalent in creative work) acceptable to the thesis director and committee, the graduate program director, and the appropriate academic dean. The thesis must represent in content and methods the skills, disciplines and knowledge required for graduate study, including competence in written language. The character of the final work must testify to the distinction of the student and standards of the University. The thesis or equivalent creative work must be worthy as a culminating experience for graduate study. Candidates will be required to defend the thesis in an oral examination. The Thesis Acceptance Form must be submitted to the Office of the University Registrar upon completion of Part A of this form. The Thesis Delivery Form must accompany this form.

The candidate should consult the Guide for Preparation of Theses and Dissertations available from the Office of Graduate Studies' web site or from the Dean's office of the appropriate college.

Change From Thesis to Nonthesis Option

A student who wishes to change from the thesis option to the nonthesis option for the master's degree must obtain the permission of the thesis

advisory committee and the graduate program director. The permission must be forwarded to the Office of the University Registrar prior to the last semester for the intended graduation using the Change of Status Form. The candidate must meet all requirements of the nonthesis option. A maximum of three credits earned in thesis research can be counted toward the degree requirements for the nonthesis option. The thesis advisory committee must indicate that the thesis research work was productive in and of itself and warrants credit as a special problem or special topics course.

Departmental Requirements

Individual colleges and/or programs may establish requirements above and beyond those set by the University as minimum. Students are obligated to follow the requirements of the appropriate graduate program section of the catalog in effect at the time of their first enrollment for this degree.

Education Specialist Degree

The Education Specialist degree (Ed.S.) normally is granted at the end of the sixth collegiate year of study and as such falls between the master's degree and the doctorate in time; however, it is not necessarily viewed as intermediate between the two degrees. The education specialist degrees provide advanced professional preparation for various positions in education.

For admission to an education specialist program, the University requires a master's degree from an accredited institution and a minimum grade point average of 3.00. Some programs have additional requirements such as a minimum Graduate Record Examination (GRE) aptitude score, grade point average, and graduate courses in specific areas.

The education specialist degree requires a minimum of 30 semester hours of graduate credit beyond a master's degree. A program may range from 30 to 39 hours, depending on the background and needs of the student. All requirements for the degree must be completed within a six-year period. Students must pass a written comprehensive examination and satisfy research requirements. Specific course requirements are found in the appropriate section of this catalog.

Doctoral Degrees

Old Dominion University offers four doctoral degrees:

1. Doctor of Engineering (DE)
2. Doctor of Nurse Practice (DNP)
3. Doctor of Physical Therapy (D.P.T.), and the
4. Doctor of Philosophy (Ph.D.)

Doctor of Engineering

The Batten College of Engineering and Technology offers a Doctor of Engineering program in addition to traditional Doctor of Philosophy programs. The purpose of the Doctor of Engineering program is to provide the Commonwealth and the nation with exceptionally educated engineering practitioners. These individuals will have developed high-level capabilities to provide innovative solutions in specialized engineering endeavors. The graduates of the program will meet the highest standards for advanced level engineering and leadership positions in industry and government.

The curriculum consists of a minimum of 48 credit hours of graduate work beyond the Master's degree including 18 credit hours of common courses (Methodologies for Advanced Engineering Projects, Project Management, Engineering Leadership, Engineering Ethics, Financial Engineering, and Engineering Corporate Management), 18 credit hours of graduate coursework in the student's area of specialization, and 12 credit hours of applied doctoral project.

Doctor of Nurse Practice

Doctor of Nurse Practice (DNP) – Advanced Practice

This program is designed to develop the roles and practice skills of advanced practice nurses including nurse practitioners, nurse midwives, clinical nurse specialists and nurse anesthetists. Nurses enrolled in this program will be prepared to serve as leaders, researchers, business owners and expert clinicians capable of transforming lives and the healthcare of the

communities they serve. Specific emphasis is on addressing the needs of underserved and vulnerable populations.

Doctor of Nurse Practice (DNP) – Nurse Executive

This program is designed to prepare the top level nurse executive for health system. The program outcomes are consistent with the American Organization of Nurse Executive guidelines for nurse executive practice. Content focuses on executive leadership skills, working with vulnerable populations, fiscal and human resource management, quality magnet achievement, emerging technology and organizational research in clinical issues. Students participate in executive internships throughout the program in their home area. Upon program completion, graduates are eligible to take the national certification examination.

Doctor of Physical Therapy

Old Dominion University offers a professional doctorate degree in physical therapy (D.P.T.) that provides individuals with the knowledge, skills, and clinical internship experiences required to sit for licensure in any jurisdiction in the United States. This curriculum is comprised of a series of required didactic and clinical education courses prescribed in a specific sequence that offers students the knowledge, professional skills and competencies necessary for entry into the practice of physical therapy. In the place of a dissertation, each student is required to develop a selected case study based upon the observations of a patient examined and treated during one of the clinical internships, a research proposal, and a research project with platform and poster presentations. In addition to satisfactorily completing the didactic and clinical education curriculum, students must pass both written and oral comprehensive examinations prior to graduation.

The curriculum consists of 117 credit hours over a three-year, nine-semester period of time including summers. There are five full-time clinical internships in the three years of study totaling 40 weeks. For details on admission and program requirements see the School of Physical Therapy and Athletics section of this catalog.

Doctor of Philosophy

Programs leading to the Ph.D. are designed to help superior students develop the capability to become creative leaders in their chosen fields. The degree is awarded upon mastery of the subject area, the development of appropriate research skills, and a concentration of knowledge in the field of specialization.

It is important to recognize that the attainment of this degree is not a matter of accumulating course credits and satisfying residency and language or research skill requirements, even though minimum requirements for these categories are set forth by the University. The final basis for granting the degree shall be the candidate's knowledge of the field of study and his or her demonstrated ability to do independent, original, scholarly research.

Each graduate program is responsible for setting out the requirements and procedures appropriate to its area of study. The requirements and regulations set forth below are to be construed as the minimal requirements established by the University. Students also are obligated to meet all additional requirements established by the appropriate graduate program.

Prerequisites for Admission

The applicant must complete the appropriate application for admission, submit official transcripts of all college- or university-level work, and supply letters of recommendation and official results of test scores as specified by the individual program. Baccalaureate and post baccalaureate work must reflect superior performance.

Minimum Requirements

Minimum degree requirements for the Doctor of Philosophy which must be considered in preparing the preliminary plan of study are:

1. Satisfactory completion of at least 48 semester hours of post-master's course work, including the dissertation or equivalent level of performance course work;
2. Demonstrated competency in research skills as required by the specific graduate program;

3. The passing of written and oral candidacy examinations at the end of the program of course work;
4. The completion of a dissertation representing independent, original research worthy of publication in a refereed scholarly journal; and
5. The successful oral defense of the dissertation before an appropriately selected committee of faculty knowledgeable in the field of the dissertation research.

Time Limits

All requirements for a doctoral degree must be completed within eight calendar years from the date of beginning the initial course following admission to the doctoral program. Exceptions to these time limits must be approved by the graduate program director and the college dean. Academic credits older than eight years at the time of graduation must be validated by an examination before the work can be applied to a doctoral degree. See the "Policy on Re-Validation of Out-of-Date Graduate Credit." Students whose graduate study is interrupted for military service will be granted an extension of time for the period of their military service, not to exceed five years.

Student Advising

The Doctoral Degree

Before completion of nine semester hours, the graduate program director, in consultation with the student, will assign a program advisor or advisory committee. The advisor or advisory committee members must be certified for graduate instruction and will meet with the student to evaluate student's academic progress. Among the advisor's/advisory committee's responsibilities are a review of student's performance in courses, assistantships (teaching research), the development and reevaluation of his/her plan of study, guidance in selecting projects and mentors, preparation and scheduling of qualifying/comprehensive or equivalent exams, time management, and obtaining employment or further education. These annual evaluations are signed by the advisor/advisory committee and the student. The evaluation is filed in the student's record and a copy given to the graduate program director.

Before completion of nine semester hours, the graduate program director, in consultation with the student, will assign a program advisor or advisory committee. The advisor or advisory committee members must be certified for graduate instruction and will meet with the student at the end of each semester to evaluate student's academic progress. Among the advisor's/advisory committee's responsibilities are a review of student's performance in courses, assistantships (teaching, research), the development and re-evaluation of his/her plan of study, guidance in selecting projects and mentors, preparation and scheduling of qualifying/comprehensive or equivalent exams, time management, and obtaining employment or further education. These annual evaluations are signed by the advisor/advisory committee and the student. The evaluation is filed in the student's record and a copy given to the graduate program director.

Plan of Study

Before completion of nine semester hours, the student shall prepare a plan of study with the aid and approval of the advisor or advisory committee. The plan of study also should be approved by the graduate program director to ensure that it meets established requirements. Failure to present the plan on time may prolong the period of study for the degree. Before drawing up and approving the plan the graduate program director should verify that there is on file a set of transcripts of all undergraduate and graduate work the student has taken. When appropriate, a diagnostic examination also may be used in developing a plan of study.

The successful completion of all work indicated on the approved plan of study is a fundamental prerequisite to the granting of the degree.

Institutional Credit Requirements for Graduate Degrees

A majority of the total credits for completion of the master's and doctoral degree must be courses offered by ODU. Some colleges, schools and departments may have additional requirements that must be fulfilled. Students interested in the opportunity to apply transfer or experimental

learning should refer to the policy on Experiential Learning Credit Options and the policy on the Evaluation of Transfer Credit in the University Graduate Catalog

Research Skills

Program skill requirements reflect the University's expectations of one or more significant skills distinct from the dissertation but fundamental to doctoral and postdoctoral research. Specific skill requirements vary with programs. Traditionally, a reading knowledge of one or more foreign languages has been required; more recently a demonstrated proficiency in computer science or quantitative methodology has been introduced.

Under University policy, each academic program leading to the Doctor of Philosophy establishes its own requirements for research skills. Responsibility for the level of competency, the nature of validating the competencies, and the standards utilized in the evaluation rests with the department/school that offers the program. Descriptions of individual programs should be consulted for appropriate regulations and procedures. Information about schedules of examination, standards, and general procedures is available from all departments/schools and graduate program directors.

The research skills requirement must be met before taking the candidacy examination. For specific information, the student should consult the appropriate program, school or college.

Candidacy Examination

The written and oral examinations qualifying a student for candidacy for the degree of Doctor of Philosophy are comprehensive in nature. The graduate program director is responsible for coordinating the administration of the written and oral candidacy examinations and will appoint a committee to administer the exams. The examination committee will be made up of at least three faculty members, all of whom must be graduate certified. Before taking the qualifying examinations, the student must meet the appropriate departmental, school and college requirements and have the recommendation of the advisor or advisory committee. The examinations are taken near the end of the student's coursework. The candidacy examinations are usually taken during the semester in which the last formal graduate courses listed in the study plan are taken.

When the student and the advisor or advisory committee have determined that the examinations should be taken, the student should obtain a Request for Permission to Take the Ph.D. Candidacy Examination no later than one month before the date of the first examination. The student should secure the signature of the advisor or advisory committee and submit the form to the graduate program director, who will verify that the student meets the prerequisites for the candidacy examinations. The graduate program director should be consulted on the schedule of the examinations. Once permission has been granted, postponement of the examinations must have the approval of the graduate program director.

After successful completion of the written examination, an oral examination, which must be taken prior to the end of the next semester, is given addressing topics discussed in the written examination and possible additional materials. The oral examination is a serious and integral part of the qualifying procedure.

A student must pass both the written and oral candidacy examinations. The written examination must be passed before the oral examination may be taken. For either the written or oral examination, more than one negative vote from the examining committee will result in a failure. A failed written examination must be retaken successfully within one year. A student who passes the written examination on the first attempt need not repeat the written exam in the event of failing the oral exam. A failed oral exam, which also may be attempted a second time, must be retaken prior to the end of the next semester.

Neither the written nor the oral examination can be passed conditionally. A pass cannot be made contingent upon doing extra courses, additional projects, etc.

The examination committee will report, in writing, to the graduate program director and the dean the results of the examinations.

Students must be registered in any semester in which they are scheduled to appear for the examination.

Dissertation Committee

After the candidacy examinations have been passed, the dissertation committee is formed to supervise the dissertation research. Membership of the Dissertation Committee may overlap with the Advisory Committee if one has already been established (see section under Student Advising). Faculty who agree to serve on a dissertation committee understand that they are committed to serve until the dissertation is completed. The committee must have approval of the graduate program director and the college dean using the Doctoral Dissertation Committee form. Replacement of the dissertation committee chair or any other substantial change in the composition of the dissertation committee initiated by the student requires that the reconstituted dissertation committee re-evaluate and re-approve the dissertation prospectus. The committee should have at least three Old Dominion University faculty members; one faculty member must be from outside the major department/school. The chair must be certified for graduate instruction and be an authority in the field of specialization of the proposed dissertation. Committee membership may be extended to a non-University person with special knowledge of the dissertation subject area. Voting privileges can be provided such specialists upon the recommendation of the chair and approval of the graduate program director and the college dean. No more than one-third of the committee's membership can be individuals external to the University. Adjunct faculty members who are certified for graduate instruction may be appointed as voting members of the committee upon the recommendation of the director of the dissertation committee and approval of the graduate program director and the college dean. The dissertation and the final oral defense of the dissertation must have the majority approval of the dissertation committee.

Change in Dissertation Committee

Changes must be made in advance of the oral dissertation defense. Changes made in the dissertation committee are made only with the approval of the graduate program director and the college dean.

Advancement to Candidacy

Advancement to candidacy is a formal step that occurs after the student has:

1. passed the Ph.D. written and oral candidacy examinations,
2. filed an approved dissertation proposal, and
3. completed formal course work.

In some colleges advancement to candidacy may be equivalent to "all but dissertation" (ABD) status. Please check with the appropriate graduate program director for further information.

Dissertation Preparation

General regulations and procedures governing the submission of a doctoral dissertation are given in the Guide for Preparation of Theses and Dissertations. Full information, including detailed procedures and qualifications for undertaking a doctoral dissertation, is available in the student's major/school and should be obtained by the student and the dissertation advisor at the beginning of the planning for research and writing of a dissertation.

After approval of the dissertation proposal, the chair of the dissertation committee shall recommend the student's admission to candidacy to the graduate program director and the dean.

Oral Dissertation Defense

The format of a defense is determined by the dissertation committee with the approval of the graduate program director. The defense is chaired by the chair of the dissertation committee. The chair will act as moderator, ruling on questions of procedure and protocol that may arise during the defense. The chair of the defense represents the college dean, to whom he or she

makes a complete and prompt report on the defense. The chair should also promptly notify the graduate program director of the results of the defense.

The oral dissertation defense is scheduled for the time and place approved in the request for the dissertation defense. A two-week lead time is required for scheduling. This information is published in the appropriate University news media. The oral dissertation defense is open to the University community; all interested members are encouraged to attend the examination.

The aim of the defense is to explore with the candidate the methodological and substantive contributions of the already approved dissertation. Majority approval by the examiners constitutes successful completion of the defense of the dissertation. In case of failure, the dissertation committee may recommend that the candidate be dropped or be allowed re-examination no earlier than three months after the first examination.

Satisfactory performance on this examination and adherence to the regulations outlined above complete the requirements for the degree. The Dissertation Acceptance and Processing Form must be submitted to the Office of the Registrar with the completed dissertation upon completion of requirements for the degree.

Dissertation Load Registration and Leave of Absence

All doctoral students who have advanced to candidacy are required to be continually registered for an appropriate number of dissertation units during each semester and summer session. (See "Graduate Student Registration Requirement.")

A candidate who finds it necessary to be excused from registration for a semester must report formally, before the beginning of the semester, to the dissertation committee and the graduate program director and request by petition a leave of absence using the Permission to Take a Leave of Absence from Graduate Studies Form. A leave of absence may not exceed one year and may not be repeated. During a leave of absence, the candidate will not be entitled to assistance from the dissertation committee or to the use of University facilities. The granting of leave of absence does not change the candidate's responsibility for meeting the time schedule for the completion of degree requirements.

Thesis and Dissertation Procedures

Graduate students who plan to write theses or dissertations should obtain copies of the Guide for Preparation of Theses and Dissertations from the Office of Graduate Studies web site for use in conjunction with any style manual preferred or required by their respective departments/schools or colleges. Minimum University requirements for the preparation of theses and dissertations are contained in the guide; departments/schools and/or colleges may set additional requirements.

Information regarding compliance with policies regulating research involving human subjects, animals, radiation, potential biohazards (e.g. recombinant DNA), lasers, controlled substances, or hazardous materials and policies regarding intellectual property can be found on the Office of Research web site at www.odu.edu/ao/research/IP-Main.htm.

All research involving human subjects, animal care and use, radiation, potential biohazards, lasers, controlled substances, or hazardous materials requires the approval signature of the appropriate review committee chair or designee, or safety officer, prior to the initiation of any research activities.

Students should be aware that in most cases, the University owns intellectual property created with University resources and can claim an interest in the intellectual property. Intellectual property must be disclosed to the Office of Research using an invention disclosure form. In order to fulfill its contractual obligations, and to adhere to the Policy on Patents and Copyrights, it may be occasionally necessary for the University to temporarily delay publication of a thesis or dissertation that contains potentially patentable information in order to ensure the availability of worldwide patent protection. Such situations would arise when a faculty member directing the research, under his/her duty as a University employee, discloses potentially patentable subject matter to the Office of Research. A

student's degree requirements can still be fulfilled even though publication of the thesis or dissertation is delayed.

Presentation of a thesis or dissertation in partial fulfillment of degree requirements necessitates submission of the finished original work to the dean of the college for final approval, following oral defense and signature approval by the thesis/dissertation committee and graduate program director. Approval of the dean of the college should be obtained prior to reproduction of the original work, in the event corrections need to be made.

Upon final approval, the student must arrange for reproduction of four additional copies of the thesis or dissertation, for a total of five for submission to the Office of the Registrar for binding. Certain doctoral programs require more than five copies; students should consult appropriate graduate program directors.

A final, approved, error-free original and four copies (more are required by some programs) of the thesis or dissertation must be received by the Office of the University Registrar no later than the day prior to the beginning of the final examination period; that is, the last day of classes of the semester in which the degree will be taken. The completed document, approved by the dean, and copies should be accompanied by the following forms: Binding Fee Receipt, Thesis/Dissertation Acceptance, Results of the Comprehensive Examination, and Thesis/Dissertation Delivery. The date on the title page of the thesis/dissertation should be within the same semester that the student intends to graduate.

A microfilming fee is also required of dissertation writers; a copyrighting fee is optional.

The student may order additional copies of the thesis or dissertation by making payment to the Office of Finance at the same time the required copies are ordered.

Experiential Learning Credit Options at the Graduate Level

Old Dominion University offers a program for assessing college-level knowledge gained through work and life experience and self-study. Students should meet with their advisors, site directors, or distance learning representative to determine how experiential learning credit affects their degree planning. A student may earn a maximum of six semester hours at the graduate level through the following mechanisms:

1. **Knowledge-based examinations.*** Upon approval of the student's graduate program director and the appropriate chair and/or dean of the college involved, a student may take a knowledge-based examination, and with a satisfactory score, receive academic credit for the course(s).
2. **External examinations.** Upon approval of the student's graduate program director and the appropriate chair and/or dean of the college involved, a student may submit satisfactory scores of professional examinations that are evaluated and recommended for graduate-level credit by the American Council of Education, and receive academic credit for the relevant course(s).
3. **Credit for training.** Upon approval of the student's graduate program director and the appropriate chair and/or dean of the college involved, a student may submit documentation of completion of professional and/or military training that is evaluated and recommended for graduate-level credit by the American Council on Education, and receive academic credit for the relevant course(s).
4. **Portfolio development.** Upon approval of the student's graduate program director and the appropriate chair and/or dean of the college involved, a student may develop a portfolio for a graduate-level course(s) offered by Old Dominion University to earn academic credit. Portfolios are submitted to the Office of Experiential Learning and Testing and assessed for credit by the appropriate department and/or college involved.

The following regulations for experiential learning credit apply:

1. Experiential learning credit be granted upon the written recommendation of the student's graduate program director and the chair of the

department/school (or designated faculty assessor) having jurisdiction over the courses involved.

2. Applicability of experiential learning credit toward a specific degree program is subject to departmental/school approval.
3. A student may not receive credit for the same course in which any grade has been previously awarded, including W (withdrawal), F (fail), or O (audit).
4. No letter grades be entered on the student's transcript for experiential learning credit, but that this credit be treated in the same way as transfer credit with "Pass" (P) and not be counted in the student's grade point average.
5. A student request experiential learning credit as early as possible upon admission to degree status. A student must meet with the degree program advisor and the director at the beginning of his or her academic career at Old Dominion University to determine how the experiential learning program may be applicable to the degree.
6. Satisfactory scores for knowledge-based examinations and professional examinations are determined by the appropriate department/school and/or dean of the college involved.
7. Necessary documentation for academic credit for professional training is determined by the appropriate department/school and/or dean of the college involved.
8. A maximum of six semester hours of graduate credit may be earned through experiential learning mechanisms. The six hours is included in the maximum number of graduate credits that may be transferred into a graduate program at Old Dominion University. Experiential learning credit does not count toward the University's residency requirement. The student must meet the minimum residency requirements of Old Dominion University and program requirements of the degree. The student must be aware of individual degree program requirements.
9. A student in a certificate or endorsement area may earn a maximum of six credit hours through experiential learning credit to apply to a certificate, endorsement or teacher licensure program. Experiential learning hours gained in these programs would be applicable to approved degree programs at Old Dominion University. In an approved graduate degree program at Old Dominion University, a graduate student who has earned six credit hours in a certificate or endorsement program that is applicable to the degree program has met the maximum number of experiential learning credit hours. No additional experiential learning credit may be applied to that graduate degree program.

Graduate Credits by Transfer

A maximum of 12 semester hours of graduate credit may be applied into a graduate degree program from graduate credits earned as a nondegree graduate student at Old Dominion University. An additional combined maximum of 12 credits may be transferred into a graduate degree program from graduate credits earned through experiential learning credit options and graduate credits earned at another accredited institution. Exceptions are allowed in the case of an approved interinstitutional program.

Transfer credit will be given only for those courses that are certified as being applicable toward a comparable degree or certificate at the institution that offered the courses, and that were completed with a grade of B or better. Specifically, in-service courses that are established especially for groups of teachers and are not intended by the home institution to be part of a degree program will not be acceptable for transfer at Old Dominion University. Exceptions to this regulation may be made only with the approval of the graduate program director and, the dean of the college. In case of doubt, it is the responsibility of the student to show that the course in question would be acceptable toward a comparable degree at the home institution.

No credit toward a graduate degree may be obtained by examination (except through the experiential learning options noted above) or correspondence study.

A student who wishes to transfer credit earned prior to admission to a degree program at Old Dominion University must submit a special request for evaluation of transfer credits through the graduate program director to the Registrar's Office. Following admission to the degree program, the student should obtain written permission from the graduate program director

before registering for a course at another institution with the intention of transferring the credit for that course toward a graduate degree at Old Dominion University.

In no case is a transfer of credit final without the signed approval of the graduate program director and the academic dean on the Evaluation of Transfer Credits Form.

Evaluation of Transfer Credits

In the case of a student who has changed programs of study at Old Dominion University, the graduate program director of the new program may or may not accept any previously transferred course work or work completed in the former programs.

Credits accepted for transfer from another institution will satisfy partial hour requirements, but grades earned in such courses are not calculated in the student's overall grade point average.

No credits will be accepted toward the degree or certificate if more than six years old (eight years for doctoral application), unless properly validated by examination.

Certificate of Recognition or Achievement for Terminally Ill and Deceased Students

When a student has completed all degree requirements but dies before graduation, the university awards the degree posthumously.

Certificate of Recognition

In those instances when a student who is close to completing a degree is terminally ill or dies before completing the degree, the university may award a Certificate of Recognition. The following criteria must be met for receiving the Certificate of Recognition. Any exceptions must be approved by the president.

Graduate Students

1. The student must be degree seeking.
2. The student must have completed at least 75% of the requirements for the degree (for the master's student this will be a minimum of 24 credits; for the doctoral student this will be a minimum of 36 credits).
3. The student must be in good academic (3.00 GPA) and disciplinary standing.
4. The student must be enrolled at ODU at the time of death or diagnosis of terminal illness.
5. The dean of the appropriate college recommends the award of the certificate.

Certificate of Achievement

In those instances when a student is terminally ill or dies before completing the degree but does not qualify for a Certificate of Recognition, the university may award a Certificate of Achievement. The following criteria must be met for receiving the Certificate of Achievement. Any exceptions must be approved by the president.

Graduate Students

1. The student must be in good academic (3.00) and disciplinary standing.
2. The student must have completed the equivalent of two semesters of full-time study (18 credits) at Old Dominion University.
3. The student must have died or been diagnosed with a terminal illness within 12 months of the last registration.
4. The certificate may be recommended by a faculty member or at the request of others, but the next of kin must approve.
5. The president or delegate will communicate with the next of kin.
6. The certificate will be presented only to the next of kin or their delegate.

Campus Services

Career Management Center

The national award-winning Career Management Center (CMC) offers a comprehensive array of career programs for students under the auspices of the Career Advantage Program (CAP). CAP is a series of career-related events and services designed to include a credit-bearing practical work experience related to a student's major. This practical experience may take the form of an internship, cooperative education experience, clinical rotation, student teaching, or a class containing a real-world, hands-on project.

CAP invites students to link with the Career Management Center and the available resources necessary for them to gain their career advantage early in their career planning process. Services are available from the time they first begin their studies at Old Dominion University. Recognizing that all students do not follow the same path, the program is designed to meet the needs of traditional, non-traditional, transfer, commuter, and distance students alike.

The Student Employment Program is designed to assist students in locating on- or off-campus, part-time, or seasonal, or Federal Work Study (FWS) positions for those who qualify. Traditional on campus employment programs for students with Federal Work Study (FWS) include, the Student Temporary Assist Team (STAT), Community Service Internship Program (CSI), and the America Reads (AR) program. Students without FWS may qualify for hourly student employment positions. The Career Management Center lists jobs of all types, including permanent full-time positions, through ODU CareerLink. This powerful interactive web-based system is available free to students and alumni of Old Dominion University. The CareerLink database contains employer information, career information, a career event calendar and interview schedules, as well as the means to electronically apply for positions posted. CareerLink is the primary tool used by the Career Management Center to communicate with students about various career opportunities and events to help students succeed at Old Dominion University and into their careers.

Individual career consultations and electronic assessment tools as well as seminars on career exploration are available to assist in major and career path selection. Each college has an experienced professional CMC staff assigned to offer career assistance to students at all levels. CMC maintains full service satellite offices in the Colleges of Arts and Letters, Business, Engineering and Technology, and Sciences, which house the CMC Liaison to that college. The Liaison for the College of Education operates a part-time center in conjunction with the College of Education's Career and Academic Resource Center. Hybrid satellite offices, providing assistance onsite live during published office hours and real time virtual assistance at other times via electronic communication technology, provide services to students at the Virginia Beach, Tri-Cities and Peninsula Regional Centers.

Cooperative education and internship experiences are available at the junior, senior and graduate levels. These programs allow students to gain valuable experience related to their major, while testing out possible career choices. All students are encouraged to participate in one or more practical experiences.

Professional seminars in resume writing, job search strategies, interview skills, salary negotiation and other career-related topics are offered throughout the year and are also available in video streamed and on-line versions. These are complemented by classroom and group presentations and other special career events, including employer information sessions, as well as employer and alumni career information panels and etiquette dinners.

General job fairs are held twice a year and are supplemented by specialized fairs for specific populations, including a teacher fair, a graduate recruitment fair, and a summer job fair. Graduating students can also take advantage of the On-campus Recruiting Program, which provides the opportunity to interview, on campus, with employers for entry-level positions.

Many of the programs and services available on campus are also offered on-line and via video streaming through the CMC website, ODU CareerLink, and the Cyber Career Center. The CMC has developed this exciting opportunity as part of the any-time, any-place virtual career center model

for students and alumni who prefer or require assistance from a career professional through electronic means. The Cyber Career Center allows CMC staff to provide quality career assistance from a distance, replicating face-to-face services through interactive media and multiple electronic means of communication. The National Association of Colleges and Employers (NACE) recognized CMC for this initiative with the Chevron Corporation Award as the most innovative career center in the country.

More information is available 24/7/365 Live by calling the Virtual Career Assistants at 800-937-ODU1 or virtually via the internet at <http://www.odu.edu/cmc>. During normal working hours please call 757-683-4388 or visit a satellite office in one of the colleges or the main CMC office in Webb Center North, suite 2202.

Guaranteed Practicum and Career Advantage Program

Old Dominion University is the only four-year, doctoral-granting institution in the United States to guarantee a practical, faculty-directed, for-credit experience related to a student's major. The Guaranteed Practicum was introduced in 1995 and is administered by the Career Management Center (CMC) as part of the Career Advantage Program (CAP) in partnership with the academic colleges.

The practicum, a practical work experience, may take the form of an internship, cooperative education experience, clinical rotation, student teaching, or a class containing a real-world, hands-on project or experience, as appropriate for each college and its majors. Classes meeting the specifications for the guaranteed practicum are clearly noted in the Courses of Instruction section of this catalog as "(Qualifies as a CAP Experience)."

The Guaranteed Practicum is the center piece of the Career Advantage Program. For more information on CAP, see the Career Management Center section of this Catalog.

Student Health Services

Old Dominion University Student Health Services is accredited by the Accreditation Association for Ambulatory Health Care, Inc. The Health Center is located at 1007 South Webb Center (757) 683-3132, Facsimile (757) 683-5930. Health Promotion services are located at 1525 North Webb Center (757) 683-5927.

Student Health Services provides primary outpatient care and health promotion for Old Dominion University students. These services include medical care for acute illness and minor injury, routine health care, preventive health care, and family planning. Student Health Services also provides referrals to health care providers in the local community for services beyond the scope of the campus health center. Laboratory testing sent off campus and x-rays or other diagnostic tests are done at the student's expense. Full-time Norfolk campus students should complete the immunization requirements before coming to school. Any immunizations administered at Student Health Services are done at the student's expense.

Health History/Immunization Requirements

All entering full-time Norfolk campus students (undergraduate, graduate, transfer, and English Language Center students) are required to complete the Tuberculosis (TB) Risk Assessment on the health history form submitted to Student Health Services. Each student determined to be part of an at risk population for TB must present the results of a TB skin test (Mantoux PPD) or TB blood test to Student Health Services within two months prior to matriculation at Old Dominion University. Any student with symptoms of active TB will be required to be tested immediately. Students are expected to be in compliance with the University Policy for TB screening.

All entering full-time Norfolk campus students are required to have all their immunizations up to date. This includes the Meningitis and Hepatitis B vaccines or signed waiver on Part C of their health history form if the student declines these vaccines. Students who do not submit the required health history/immunization documentation will not be allowed to register for the second semester. A complete list of immunization requirements and health history/immunization forms are on the Student Health Services website at <http://www.odu.edu/studenthealth>.

Health Promotion

Health promotion provides Old Dominion University students with information, education and programs to address their health concerns and needs. Health promotion focuses on the whole person and seeks to engage students in educational, experiential, and service learning opportunities to illustrate the importance of a healthy lifestyle. Health promotion is also responsible for campus-wide programs. Topics include: alcohol, drugs, sexual health, nutrition, stress and many other factors that affect student success. Students may volunteer as members of the Student Health Advisory Committee (SHAC). Call (757) 683-5927 to speak with a health educator.

Student Health Insurance

All full-time and part-time students are encouraged to make provision for payment of charges for health services not provided by Student Health Services. The University recommends that all students carry adequate personal health insurance. International students are required to have health insurance. See the Student Health Services web site for information regarding health insurance at <http://www.odu.edu/studenthealth>.

Housing

Graduate students are encouraged to seek off-campus housing through the Housing & Residence Life Office. Off-Campus Housing Services provides guidance and support to students who desire off-campus housing accommodations. Students are provided resources and educational materials to help them in their search for affordable and convenient housing. Students are also provided access to the listings directory where local landlords and property managers post vacancies specifically intended for ODU students.

For further information about living off-campus please visit www.odu.edu/offcampushousing. For answers to specific questions or for one-on-one assistance, contact: **Off-Campus Housing Services, 4603 Elkhorn Avenue, Suite 1208, Norfolk, VA 23529** or email: OffCampusHousingServices@odu.edu (%20OffCampusHousing@odu.edu).

International Student and Scholar Services (ISSS)

The Old Dominion University community includes more than 1000 international students and 100 visiting scholars from more than 110 foreign countries. Serving the cultural, legal, and personal needs of these individuals is the main mission of the Office of International Student and Scholar Services. The office provides administrative support and documentation services along with information and regulatory advising to assist international students and scholars in obtaining the best educational experience possible. ISSS also works closely with academic departments and administrative offices, offering workshops to staff members that help build awareness of the international community's needs as well as to develop and strengthen skills in intercultural communication. Among the specific offerings of the Office of International Student and Scholar Services is a complete range of immigration advising and individual assistance with the many cultural aspects of studying in a foreign country. ISSS administers the International Student Leadership Award Program, which provides tuition support for undergraduate international students who demonstrate extraordinary leadership and academic involvement. Visit the ISSS website at www.odu.edu/iss.

Filipino American Center

In line with Old Dominion's vision of a multicultural university, the Filipino American Center responds dynamically and creatively to the academic, educational, cultural, and social concerns of Filipino Americans. It serves as a resource and research center for Philippine history and culture and the Filipino American experience. It is a center for social interaction where Filipino culture and values are promoted, revitalized and celebrated. The center serves as a cultural liaison to the University and the Hampton Roads communities. Its strategic location in the College of Arts and Letters allows for an integrated approach in crafting and encountering new avenues of culture with a distinctive academic orientation.

The Center incorporates into its programs a heightened awareness for the diverse heritage of the Filipino American. The goals of the center are to serve as a resource center for the University, the Filipino American and the Hampton Roads communities and conduct research on Filipino Americans, promote courses in Filipino American Studies, and plan summer programs or semester abroad (Philippines), and foster close linkages with Filipino American alumni.

The Filipino American Center is located in Dragas Hall, Room 2000. For more information, visit the web page at www.al.odu.edu/filipino/.

The Office of Intercultural Relations (OIR)

The Intercultural Center

The Intercultural Center, located at 2114 Webb Center, serves as a cultural hub for students and faculty. With its fully mediated and functional design, faculty can conduct classes, visitors can relax in plush seating while reading books from the Center's library or watching programs and DVDs on one of the 46" plasma televisions. Students have access to the computer area, can learn a new language with Rosetta Stone programs, or have a group study session. The Intercultural Center is not only a study or work space, it is also an area where students can relax and connect with friends and the University community.

The Diversity Institute

The Diversity Institute (DI) enhances awareness, commitment, knowledge, and skills that are needed to develop leaders as change agents in a culturally diverse world. Semester-long sessions include modules and cultural learning labs that train participants on how to operate in a diverse multicultural and global setting. In addition to developing communication skills needed in a pluralistic society and expanding one's world view, DI is an excellent resume-builder. For more information, visit the Diversity Institute site at <http://www.odu.edu/life/gettinginvolved/leadership/diversity-institute>.

International Initiatives Unit

As citizens of a new, global community, it is imperative that individuals have the skills to navigate diverse settings and successfully interact with others. Therefore, OIR is committed to the academic, social, and cultural support of the international student population, as well as providing opportunities for domestic students to enhance their own cultural competency. OIR strives to sustain a vibrant international student community by providing an array of services, such as arrival assistance, orientation support, on- and off-campus activities, and social networking opportunities. OIR actively encourages international-domestic student relationships by providing cultural programs and events such as International Festival, International Education Week, Global Monarch Club, the International Student Advisory Board, and various cultural celebrations throughout the academic year. Thus, programs, workshops, activities, and events are designed so that participants will be prepared for successful integration into today's global society.

Intercultural Initiatives Unit

Hispanic Heritage Month, Black History Month, Native American Month, Asian American Seasons, Interfaith Dialogues, and LGBTQ Heritage are just a few of the cultural expressions that educate the campus and Hampton Roads about the diversity within our multicultural communities. Student affinity groups facilitated by OIR allow current Monarchs the opportunity to engage and provide an active advisory role regarding OIR programs and events. Our programs, activities, and educational initiatives are designed to raise the awareness of the complexities within American cultural frameworks and how one can negotiate positive engagement across and within cultures.

Social Entrepreneurship

The Social Entrepreneurship unit consists of the Social Entrepreneurs Council (SEC); Spark Change Theater; Intercultural Matters Series; Faculty Voice Brown Bag Series; and the Dialogue on Emerging Issues. In partnership with the SEC advisory council, the Office of Intercultural Relations presents innovative film forums, workshop series, lecture series, and informal discussions that promote faculty and student engagement and

co-curricular opportunities for the exploration of social justice paradigms and intercultural systems.

The Office of Intercultural Relations is located at 2109 Webb University Center. Please visit the website at <http://www.odu.edu/oir>; OIR is on Twitter, Facebook, Instagram, and Tumblr.

Graduate Student Organization (GSO)

The Graduate Student Organization is an officially recognized group formed especially to meet the needs of Old Dominion University's graduate student body. The goal of the organization is to be an outlet for the graduate student voice, to act as a liaison group between the graduate students and the University, and to bring the University the concerns or issues that are specific to the graduate student community. Foremost among its many goals is to form an overall meeting arena for the graduate students to get to know each other outside of individual courses of study.

Current projects include working on such issues as graduate health insurance, graduate housing opportunities, and increased support for graduate research and professional development.

For more information, see orgs.odu.edu/gso.

Recreation and Wellness

The Recreation and Wellness Department vision is "Through quality innovative programs and services, we provide the foundation for lifelong exploration and development of the mind, body, and spirit." The department offers programming in the following areas:

- Intramural Sports
- Informal Recreation
- Sport Clubs
- Fitness & Wellness
- Outdoor Adventure
- Aquatics
- Summer Camps
- Student Development

The Student Recreation Center is a state-of-the-art facility that features nearly 15,000 square feet of fitness equipment, a rock climbing wall, a multi-activity center gym, racquetball courts, a cycling studio, an outdoor adventure rental center, and much more. The Student Recreation Center is located at 4700 Powhatan Avenue. In addition, the Fitness Center at University Village provides participants with another state-of-the-art workout facility. Participants must be able to validate their identity with the biometric hand system or a valid University ID card when attempting to enter or participate in programs and activities sponsored by the department. For daily updates of programs and services, hours and special events, visit the webpage at <http://www.odu.edu/recreation> or contact the office at 683-3384.

Women's Center

The Women's Center offers programs and services designed to promote gender equity and address the special challenges and opportunities female students encounter in the pursuit of higher education. Recognizing the critical role that both women and men play in promoting an environment free of gender bias, Center programs are designed to educate and inspire students to achieve their personal, academic and professional potential.

The Sexual Assault Free Environment (S.A.F.E.) Program provides crisis intervention, education, advocacy and ODU policy/procedure information related to issues of sexual assault, stalking, sexual harassment, and relationship violence. W.I.L.D., Women's Institute for Leadership Development, provides an opportunity for female students to identify and develop their leadership skills through seven modules. Additional programs are offered throughout the year that address a variety of topics related to women's academic and personal success including programs in celebration of Women's History Month in March. Referrals to University and community resources are also available. Students are encouraged to get

involved with the Women's Center as a volunteer, intern, or M-POWER Peer Educator.

Programs and services of the Center are open to women and men. For more information, please call 757-683-4109 or visit <http://www.odu.edu/life/support/womenscenter>.

Title IX of the Education Amendments of 1972 prohibits discrimination based on sex in educational programs and activities. Sexual harassment and sexual misconduct have been recognized as a form of discrimination in violation of Title IX. For information, counseling or to file a complaint of discrimination or harassment on the basis of sex, individuals may contact the Title IX Coordinator, who is also the Assistant Vice President for Institutional Equity and Diversity, located at 121-A Spong Hall; the Assistant Vice President can be reached at (757) 683-3141 or rdunman@odu.edu.

Dining Services

Monarch Dining Services is responsible for many operations across campus. Webb Center is home to a wide range of dining options including Café 1201, House of Blue Food Court, and Monarch Catering. Café 1201 is a residential restaurant dining option that allows students to use their meal plans in Webb Center and provides a value to faculty, staff, and students. Also located in Webb Center are franchise favorites like Chick-fil-A and Starbucks. Legends in Whitehurst Hall and Rogers Café in Rogers Hall are dining facilities available to all cash, credit, meal plan, Flex Points, and Monarch Plus customers. These all-you-care-to-eat locations provide a residential restaurant within the student housing facility.

Dining Services has over 15 locations across campus to satisfy a variety of cravings---including residential restaurants, food court and franchise favorites, convenience stores, and coffee shops.

Monarch Catering offers services from coffee set-ups to extensive dinner menus and everything in between.

For hours of operation and more campus dining information, please visit the website at www.odu.edu/monarchdining.

Parking and Transportation Services

The department of Parking and Transportation Services is responsible for providing quality parking and transportation services throughout campus. A variety of surface parking lots and garages are available throughout campus to students, faculty and staff. All motor vehicles parked in University parking facilities must display a valid parking permit. Students, faculty and staff are required to purchase permits. Permits may be purchased online at www.odu.edu/parking or at the Parking and Transportation Services Office. Visitors and guests may park in metered spaces in garages A and B on 43rd Street and Elkhorn Avenue or the visitor's parking lot on 49th Street. The Parking and Transportation Services office is located on the corner of 43rd Street and Elkhorn Avenue.

University motor vehicle regulations are enforced year around except as noted in the ODU Motor Vehicle Regulations. Permit regulations are enforced from midnight Sunday until 4:00 p.m. Friday. Evening permits are available for purchase by students attending classes after 3:45 p.m. and are not valid prior to 3:45 p.m.

Parking and Transportation Services has many alternative transportation options for students who do not have a vehicle on campus. ODU shuttle buses take students around the Norfolk campus and to off-campus locations such as Wal-Mart and Kroger. Hampton Roads Transit (HRT) bus passes are available at the Parking and Transportation Services office for the fall and spring semesters for all current students. Zipcars are also located on campus for students 18 years or older to utilize for low hourly or daily rates.

Additional information on rules, regulations, and services may be obtained by calling Old Dominion University Parking and Transportation Services at (757) 683-4004 or by visiting the website at <http://www.odu.edu/parking>.

University Village Bookstore

The University Village Bookstore is the official on-campus bookstore of Old Dominion University – offering products and services to students, faculty and the surrounding community both in-store and online via shopodu.com (<http://www.shopodu.com>). The University Village Bookstore houses 20,000 titles providing the most options to the campus community. The primary purpose is to serve the students of the University by making books and supplies available for courses.

Additionally, the bookstore serves the campus community by maintaining a wide selection of computer products, alumni apparel, ODU football and basketball gear, gifts, and accessories. Furthermore, the bookstore provides faculty services, a robust used books program, Rent-A-Text, and a growing CafeScribe digital library. The bookstore also hosts events that include book signings and children's events. Store partners include eBooks, Greek apparel, Software Shop, and Starbucks.

The bookstore is located at 4417 Monarch Way and is open Monday-Friday, 8:00 a.m. to 7:00 p.m., Saturday 10:00 a.m. to 5:00 p.m. and Sunday 12:00 noon to 5:00 p.m. For additional information, please call 757-683-0048.

University Card Center

All students who are officially registered for one or more credit hours in the current semester at Old Dominion University are eligible to receive a free student ID card. Student ID cards are issued at the University Card Center located in Room 1056 Webb Center. If the ID card is lost or stolen, there is a replacement fee. Spouses and dependents of students are not eligible to receive an ID card.

The University ID card is an official form of identification. The ID card lists the bearer's first name, last name and middle initial, University identification number (UIN) and status with the University. Each student can possess only one valid ODU ID card at a time. The ID card must be carried at all times when at Old Dominion University and presented upon request to University officials. Any misuse of the University ID card will result in disciplinary actions.

Not only is the University ID card an official form of identification, it also serves many other functions. Students can use their card to check out books from the library, participate in University events, obtain HRT bus passes, access their residence hall, use their meal plan, and make purchases from their Monarch Plus account. Monarch Plus can be used at on-campus locations and participating merchants off campus. For more information, visit the website at www.odu.edu/cardcenter, email cardcenter@odu.edu, or call 757-683-3508.

Webb University Center

Opened in May 1966, Webb University Center was named after the University's first president, Lewis W. Webb, who served the University from 1962 until 1969. Webb Center is the community center for all members of the University family--students, faculty, staff, administration, alumni, and guests. The Center provides services, conveniences, and amenities that members of the University family need in their daily lives on campus. It also provides a place for getting to know and understand one another outside the classroom.

Webb University Center's staff are dedicated to providing a friendly and attractive environment in which campus constituents can be brought together to build campus community. The staff provide services and maintain the facility in support of student learning and development through student activities, programs, meetings, and special events.

Webb Information Desk

Webb Information Desk provides students, faculty/staff, and guests of the University with information about departments, student organizations, activities, classes, policies, and more. In addition, the Information Desk offers the following products and services: postage stamps, student organization event tickets, car assistance program, semester locker rentals, lost and found, game room equipment, and free DVD rental service. The

Webb Information Desk is located in the front lobby of Webb Center and can be reached by calling (757) 683-5914.

Educational Accessibility

The Office of Educational Accessibility is committed to creating access to higher education for students with disabilities. The University meets the requirements of Section 504 of the Rehabilitation Act of 1973 and the Americans With Disabilities Act of 1990 and its Amendments of 2008 by providing accommodations and services, which are based upon documentation submitted by the student. Reasonable accommodations are made for students with learning, medical, psychological, visual, hearing, physical, temporary mobility, and other impairments on an individual basis. Accommodations and other supportive services available in the Office of Educational Accessibility make a positive difference in the educational experience of students with disabilities and contribute significantly to their academic success.

In order to obtain assistance, all students must provide appropriate documentation and register with the Office of Educational Accessibility. Guidelines for documentation and procedures for registration may be located at <http://www.odu.edu/educationalaccessibility>. More specific information can be obtained by calling (757) 683-4655. Student interactions with the Office of Educational Accessibility remain confidential. New students needing interpreters are expected to contact the Office of Educational Accessibility at least 45 days before registration to make arrangements. Currently enrolled students need to make arrangements for accommodations as soon as they have pre-registered for a semester.

The Office of Educational Accessibility is located at 1021 Student Success Center.

The Section 504 Coordinator, who is also Assistant Vice President for Institutional Equity and Diversity, is located at 1301 Spong Hall and can be reached at (757) 683-3141.

Division of Student Engagement and Enrollment Services

The Division of Student Engagement & Enrollment Services is responsible for the development, implementation, communication, and maintenance of an institutional focus on student success, which includes enrollment management. In partnership with the Provost and other University leaders, this area is responsible for the coordination of student success programs across the University and for student retention. The division provides creative leadership and strategic direction for a diverse array of student engagement services and programs including: Admissions (Undergraduate, Graduate, International), Assessment/Planning and Budget Management, Campus Ministries, Career Management Center, Center for Major Exploration, Counseling Services, Divisional IT Support, Financial Aid, Housing and Residence Life, Intercultural Relations, International Student Programming, Recreation and Wellness, Student Activities and Leadership, Student Conduct and Academic Integrity, Student Engagement, Student Health Center, Student Ombudsperson Services, Student Transition and Family Programs, Summer Camps and Conferences, Transfer Evaluation Services, and Women's Center.

Student Ombudsperson Services (SOS)

Student Ombudsperson Services (SOS) provides services to students who experience administrative, academic, or personal road blocks. These services include extended absence notification, emergency grants, and administrative withdrawals from the University. SOS is available to help students achieve their personal and academic goals

ODU Cares is an extension of Student Ombudsperson Services. The Care Team was developed to provide a University-wide system of care and support for students who experience an unexpected crisis. The Care Team's role is to determine effective strategies for addressing concerns and connecting students with the appropriate resources. Student Ombudsperson Services is located in Suite 2008, second floor South Wing of Webb Center, and can be reached at (757) 683-3442 or smims@odu.edu. For

more information please visit the SOS website at: <http://www.odu.edu/life/support/ombudsperson>.

Office of Leadership and Student Involvement

Involvement in campus life contributes to students' overall development. By discovering and participating in co-curricular activities, students can develop their interpersonal and leadership skills and increase their career-related learning. The Office of Leadership and Student Involvement (LSI) provides experiences, services and opportunities that promote the advancement of social and intellectual development. By encouraging student involvement, LSI promotes life-long learning, responsible citizenship and a commitment to the Monarch and surrounding communities. For more information, visit the website at <http://www.odu.edu/studentinvolvement> or call (757) 683-3446.

The office oversees the following:

Leadership Development

To maximize and realize the potential of individual students and student organizations, the Office of Leadership and Student Involvement assists in the planning and implementation of leadership conferences, seminars, courses, and retreats throughout the academic year. These programs, available to any special interest group or student organization, focus on the identified purpose or needs of each group. Individual students interested in developing their leadership skills are also urged to participate. Events include the Leadership Lecture Series, LeaderShape, Freshman Summer Institute, and Monarch Leaders Retreat.

Center for Service and Civic Engagement

The Center provides students with the opportunity to enhance their educational experience beyond the boundaries of the classroom by engaging in meaningful service to the campus and local and global communities. Events include Relay for Life, Blue Goes Green Week, Adopt-A-Spot, and Haul for Hunger.

Student Organizations

There are over 300 student organizations that promote student interests in a broad range of fields. Organizations are student-run and a complete list of organizations can be found at <http://odu.orgsync.com/SearchOrgs>. To support these organizations, LSI coordinates the recognition and annual registration process for new and existing organizations, provides officer training, group development, leadership education, budget utilization, and guidance in the organization of major concerts, programs, and other activities that groups sponsor.

U-Center

To facilitate collaboration between student organizations and members within student groups, the U-Center includes computers, work spaces, storage, a conference room and lounge area. Students can meet in the U-Center located at 1045 Webb Center.

Fraternity and Sorority Life

OSAL advises 18 international/national fraternities and 10 international/national sororities at Old Dominion University. The purpose of these organizations includes the maintenance of high standards of fraternal life and inter-Greek relations and cooperation with the University in achieving high social standards and sound scholarship. Service to the University and the community, encouragement for leadership and brother/sisterhood are also at the forefront of Greek activity. The groups are coordinated through the National Pan-Hellenic Council (NPHC), Interfraternity Council (IFC), and Panhellenic Council (PHC), along with Leadership and Student Involvement. Top Greek leaders and scholars are eligible for membership in the Order of Omega National Greek Honor Society. Any student interested in Fraternity and Sorority Life at Old Dominion University should visit <http://www.odu.edu/life/gettinginvolved/greek>.

Fraternities at the University

- Alpha Phi Alpha
- Kappa Alpha Psi
- Kappa Delta Rho
- Kappa Sigma
- Lambda Chi Alpha
- Lambda Upsilon Lambda
- Omega Psi Phi
- Phi Beta Sigma
- Phi Gamma Delta
- Phi Kappa Tau
- Phi Mu Alpha
- Pi Kappa Alpha
- Pi Kappa Phi
- Sigma Nu
- Sigma Phi Epsilon
- Sigma Pi
- Tau Kappa Epsilon
- Theta Chi

Sororities at the University

- Alpha Phi
- Alpha Kappa Alpha
- Alpha Xi Delta
- Delta Zeta
- Kappa Delta
- Pi Beta Phi
- Sigma Gamma Rho
- Sigma Lambda Upsilon
- Zeta Phi Beta
- Zeta Tau Alpha

Student Activities Council

Student Activities Council (SAC) is a student-run organization with the goal of providing quality events for Old Dominion University including films, special events, speakers, concerts, and Homecoming. Committee members help in planning and organizing these events.

Mace and Crown Newspaper

Students at Old Dominion University publish a weekly newspaper, the Mace & Crown, every Wednesday throughout the academic semesters. In addition to keeping the campus informed, the newspaper provides students the opportunity to develop skills in writing, photography, advertising, and management.

Student Government Association

The Student Government Association (SGA) is involved in many topical issues touching all areas of University life. Participating in SGA is open to all students who may serve as elected senators or as volunteers on committees. Call 683-3438 for more information regarding these positions.

WODU Radio Station

The student-operated campus radio station serves two main purposes: providing experience for students interested in broadcasting and entertaining and sharing relevant information with the student population. Students involved with WODU can develop their skills in all areas of broadcasting including management, marketing, engineering and news and sports reporting.

Event Management

Through Event Management, OSAL coordinates all space allocations in Webb Center for meetings and events.

Promoting and Building Spirit and Pride through ODU Traditions

OSAL sponsors events to help students feel connected and show Monarch pride.

Implementation of Major Programs and Events

OSAL helps to plan and implement activities and events to enrich the lives of students. These include Main Street (the campus involvement fair), Homecoming, Student Engagement and Enrollment Services Leaders Award Ceremony, Week of Welcome, and Programs All Weekend (PAW).

Graduate Degree and Post-Baccalaureate Certificate Programs

College of Arts & Letters

Degree	Majors
Doctor of Philosophy (Ph.D.)	Criminology/Criminal Justice, English, International Studies
Master of Arts (M.A.)	Applied Linguistics, Applied Sociology, English, History, Humanities, International Studies, Lifespan & Digital Communications
Master of Fine Arts (M.F.A.)	Creative Writing
Master of Music Education (M.M.E.)	
Graduate Certificate Programs	Geographic Information Science, Literature, Maritime History, Modeling and Simulation in International Studies, Professional Writing, Spatial Analysis of Coastal Environments, Teaching of Writing, TESOL, Women's Studies

Strome College of Business

Degree	Majors
Doctor of Philosophy (Ph.D.)	Business Administration, Public Administration & Urban Policy
Master of Arts (M.A.)	Economics
Master of Business Administration (M.B.A.)	
Master of Science (M.S.)	Accounting, Computer Science
Master of Public Administration (M.P.A.)	
Graduate Certificate Programs	Homeland Security, Public Administration and Policy, Public Procurement and Contract Management, Maritime Ports and Logistics Management, Modeling and Simulation for Business and Public Administration

Darden College of Education

Degree	Majors
Doctor of Philosophy (Ph.D.)	Community College Leadership, Counseling, Curriculum & Instruction, Early Childhood Education, Educational Leadership, Higher Education, Human Movement Science, Instructional Design & Technology, Literacy Leadership, Occupational & Technical Studies, Special Education
Educational Specialist (Ed.S.)	Counseling, Educational Leadership, Higher Education
Master of Science in Education (M.S.Ed.)	Biology, Chemistry, Counseling, Early Childhood Education, Educational Leadership, Elementary Education, English, Physical Education, Reading, Secondary Education, Special Education, Speech-Language Pathology
Master of Science (M.S.)	Occupational and Technical Studies
Graduate Certificate Programs	Applied Behavior Analysis, Autism, Military Children and Families, Modeling and Simulation in Education and Training

Batten College of Engineering and Technology

Degree	Majors
Doctor of Philosophy (Ph.D.)	Aerospace Engineering, Biomedical Engineering, Civil and Environmental, Electrical and Computer Engineering, Engineering Management, Mechanical Engineering, Engineering, Modeling and Simulation
Doctor of Engineering (D.Eng)	Aerospace Engineering, Civil and Environmental Engineering, Engineering Management and Systems Engineering, Mechanical Engineering, Modeling and Simulation
Master of Engineering (M.E.)	Aerospace Engineering, Civil Engineering, Electrical and Computer Engineering, Environmental Engineering, Experimental Methods, Mechanical Engineering, Modeling & Simulation, Motorsports Engineering, Systems Engineering
Master of Science (M.S.)	Aerospace Engineering, Civil Engineering, Electrical and Computer Engineering, Engineering Management, Environmental Engineering, Mechanical Engineering, Modeling and Simulation
Master of Engineering Management (M.E.M.)	
Graduate Certificate Programs	Biomedical Engineering, Advanced Cyber Systems Security, Advanced Engineering, Coastal Engineering, Engineering Management, Homeland Security, Modeling and Simulation in Engineering, Naval Architecture and Marine Engineering, Professional Study in Engineering Management

College of Health Sciences

Degree	Majors
Doctor of Philosophy (Ph.D.)	Health Services Research
Doctor of Nursing Practice (D.N.P.)	
Doctor of Physical Therapy (D.P.T.)	
Master of Science (M.S.)	Community Health, Dental Hygiene
Master of Science in Athletic Training (M.S.A.T.)	
Master of Science in Nursing (M.S.N.)	
Master of Public Health (M.P.H.)	
Graduate Certificate Programs	Global Health, Modeling and Simulation for Health Sciences, Molecular Diagnostics, Nurse Educator, Nurse Executive, Occupational Safety

College of Sciences

Degree	Majors
Doctor of Philosophy (Ph.D.)	Applied Experimental Psychology, Biomedical Sciences, Chemistry, Clinical Psychology, Computational and Applied Mathematics, Computer Science, Ecological Sciences, Human Factors Psychology, Industrial/Organizational Psychology, Oceanography, Physics
Master of Science (M.S.)	Biology, Chemistry, Computational and Applied Mathematics, Computer Science, Ocean and Earth Sciences, Physics, Psychology
Graduate Certificate Programs	Cybersecurity, Modeling and Simulation - Computing and Informatics, Modeling and Simulation - Human Factors Psychology, Modeling and Simulation - Mathematics and Statistics, Spatial Analysis of Coastal Environments

College of Arts & Letters

www.al.odu.edu/

9000 Batten Arts & Letters Building
(757) 683-3925
(757) 683-5746

Charles Wilson, Dean
Janet Katz, Associate Dean
David C. Earnest, Associate Dean for Graduate Studies and Research

Ph.D.

Criminology & Criminal Justice
English
International Studies

M.F.A.

Creative Writing

Master's

Applied Linguistics (M.A.)
Applied Sociology (M.A.)
English (M.A.)
History (M.A.)
Humanities (M.A.)
International Studies (M.A.)
Lifespan and Digital Communication (M.A.)
Music Education (M.M.E.)

Mission

The College of Arts and Letters is committed to the ideals of the liberal arts. Its curriculum is designed to introduce students to the full range of human experiences through the study of cultural heritage, forms of artistic and literary expressions, patterns of social and political behavior, and methods of critical inquiry. The mission of the College of Arts and Letters is to prepare students for rigorous, intellectual and creative inquiry leading to their full development as human beings and to their responsible engagement with society. We accomplish this mission by:

1. Developing the essential skills of critical reading and thinking, effective oral and written communication, and proficient use of technology
2. Providing foundational knowledge in the arts, humanities and social sciences for all undergraduates
3. Offering excellent disciplinary and interdisciplinary programs of study and training that expose students to accumulated knowledge, scholarly debate, and innovations in the field
4. Fostering global awareness and sensitivity to the breadth and diversity of the human condition, which includes acquiring an understanding of the roles of gender, race, ethnicity, and culture
5. Providing an atmosphere for the free exchange of ideas among faculty and students and by vigorously defending academic and intellectual freedom
6. Promoting challenging internship opportunities, research projects, and collaborative learning experiences that connect our students to the community and prepare them for the world of work
7. Supporting a broad array of cultural experiences that enrich the lives of students, the University, and the community

Overview

Graduate programs in the College of Arts and Letters are structured to make possible close personal contact between students and faculty and thus to meet the needs of individual students. Arts and Letters faculty members are dedicated to good teaching, proud of their achievements in research, and committed to enhancing in every way possible the exciting and stimulating environment that is Old Dominion University. The College of Arts and Letters has graduate programs in Applied Linguistics, Applied Sociology, Criminology and Criminal Justice, English, History, Humanities, International Studies, and Music Education. The College offers M.A. degrees in Applied Linguistics, Applied Sociology, English, History,

Humanities and International Studies; the M.F.A. degree in Creative Writing; and Ph.D. degrees in Criminology and Criminal Justice, English, and International Studies.

Department of Communication & Theatre Arts

3000 Batten Arts and Letters
757-683-3828

Stephen Pullen, Chair

Master of Arts – Lifespan and Digital Communication

Thomas J. Socha, Graduate Program Director

The Master of Arts in Lifespan and Digital Communication focuses on the study of human communication and digital media as they develop across the lifespan and is based on the assumption that relational communication, information gathering, conflict management, entertainment consumption, and social media use differs among, within, and between people at various stages of life (childhood, adolescence, young adulthood, middle age, and elder adulthood). Understanding and analyzing the inseparable relationship between lifespan communication and digital media is a key to success in most 21st century jobs, particularly in the interrelated employment areas of applied research and policy, community networking and outreach, creative industries, education and training, and health and wellness.

Admission Information

In addition to meeting all general University requirements, an applicant must have an undergraduate average of at least 3.25 in Communication or a related field and a 3.0 overall; two letters of recommendation from faculty members, or those who can evaluate the applicant's academic potential; GRE scores typically at or above 1000 as a composite of verbal and quantitative scores; and a 500-word essay that outlines the applicant's professional and personal goals in pursuing this degree, while explaining the relationship of these aforementioned goals to the Lifespan and Digital Communication degree program.

Degree Requirements

The Master of Arts degree in Lifespan and Digital Communication requires 36 credit hours (non-thesis option) or 33 credit hours (thesis option). No more than 12 credit hours may be taken on the 500 level. Both non-thesis and thesis option students take five required core courses (15 hours) that include:

COMM 601	Lifespan Communication Research and Theory	3
COMM 602	Digital Communication Theory and Research	3
COMM 603	Social Change and Communication Systems	3
COMM 604	Lifespan Communication Research Methods	3
COMM 605	Critical Methods and Digital Communication	3
Total Hours		15

In addition, students pursuing the non-thesis option take 18 credit hours of COMM electives and a required 3-credit hour capstone seminar COMM 685. Students pursuing the thesis option take an additional 9 credit hours of COMM electives, COMM 689 (3 hours) (in the first semester they register for thesis hours) as well as COMM 698 & COMM 699: Thesis (six hours) in lieu of COMM 685. This thesis is based on original scholarly research and must address a specific and viable topic salient to the student's core and elective coursework in Lifespan and Digital Communication.

The thesis option is recommended for those students who have maintained a high GPA, have the support of a faculty advisor from the Communication and Theatre Arts department, and who are considering further studies at the doctoral level. The thesis committee, consisting of a chair and two other faculty members certified for graduate instruction, direct and evaluate the student's work. Approval of the thesis proposal by the student's committee

and GPD is required before the completion of 27 hours of coursework. Upon completion of the thesis, the committee will conduct a two-hour examination and defense of the thesis.

B.S/BA.-M.A. Program

An accelerated BS/BA-M.A. program is available for selected undergraduate students pursuing a Bachelor of Arts or Bachelor of Science degree. For specific information please refer to the Undergraduate Catalog (<http://catalog.odu.edu/undergraduate/collegeofartsletters/communicationandtheatrearts>).

Department of English

5000 Batten Arts and Letters
757-683-3991

Dana Heller, Chair

Graduate Programs in English

There are four graduate programs in the English department:

1. Master of Arts in English;
2. Master of Arts in Applied Linguistics;
3. Master of Fine Arts in Creative Writing and
4. Ph.D. in English.

Each program has its own guidelines and admissions policy.

Master of Arts - English

Imtiaz Habib, Graduate Program Director

The Master of Arts program in English develops professional competency in literary and textual analysis and in writing. The program offers emphases or options in literature, the teaching of English, rhetoric and composition, and professional writing. The program prepares students for further graduate study in English; for professional writing and editing; for teaching in secondary schools and colleges; for further study in such fields as anthropology, law, psychology, and philosophy; for careers in government and industry; and for other professions requiring analytical, literary, linguistic, digital media, or writing skills.

Admission Information

The student must initially meet all general University admission requirements. Scores from the Graduate Record Examination general test are required. For regular admission, students must generally have at least 24 undergraduate hours in English, or a closely related field, with a grade point average of 3.0 or better. However, students applying to the professional writing concentration (see professional writing option) may have little or no undergraduate course work relating to English, provided that they have an average of 3.0 or better in their undergraduate major. Students applying to all concentrations must also, in addition to other admissions materials, provide a writing sample, preferably of previous professional or academic work, that demonstrates their preparation for graduate-level writing. All students in the English graduate program must demonstrate a high level of skill in written expression.

International students must submit scores from the TOEFL examination, a sample of scholarly writing, and three recommendations, at least one of which evaluates ability in English. For regular admission, students must score 230 on the computer-based TOEFL (the equivalent of 570 in the older, paper-based score scale or 80 on the TOEFL iBT). Students may be admitted provisionally with a TOEFL score of 213 (550 in the paper-based scale), but must attain the scores required for regular admission after 12 hours of graduate work.

Degree Requirements

The Master of Arts degree in English requires 30 credit hours and the passing of a comprehensive oral examination. No more than 12 credit hours on the 500 level may be counted toward a degree. An identifiable unifying principle is required for each student's program.

Master of Arts Thesis Option

The opportunity to undertake a long research project or other appropriate project is available to students in the Master of Arts in English. Writing a thesis may be of particular benefit to those who contemplate further graduate work or who have a strong desire to pursue a single topic in great depth. Under the guidance of an advisor (a member of the graduate faculty), the student may earn six hours of credit for a completed, approved thesis.

Master of Arts Oral Comprehensive Examination

During the first three weeks of the semester in which they intend to graduate, students must contact the graduate program director in English to schedule their comprehensive examination. The oral comprehensive examination covers each student's particular program of study. Based on the courses taken by the student, the examination tests the student's mastery of materials and concepts, interpretive skills, and ability to make critical distinctions and connections. The examination of a thesis student will also cover the thesis and its related areas. Students who fail the oral comprehensive examination may retake the test only once in a different semester. Students who fail a second time will no longer be eligible to receive the Master of Arts in English from Old Dominion University.

Literature Option

This option, which offers a comprehensive grounding in literary and cultural studies and critical theory, prepares students for careers in community college and four year university teaching, public media, and a variety of jobs in the public sphere. It also prepares students for advanced literary and cultural studies at the Ph.D. level. For students in other programs this option offers as well a Certificate in Literature which helps to qualify them for secondary school teaching.

Edward Jacobs, Coordinator

This option requires:

ENGL 600 Introduction to Research and Criticism 3

Controlled Electives (18 hours)

British Literature before 1800:

One course from: 3

ENGL 503	Medieval Literature
ENGL 507	Chaucer's Canterbury Tales
ENGL 516	English Renaissance Drama
ENGL 521	British Literature 1660-1800
ENGL 532	Origins and Early Development of the British Novel to 1800
ENGL 615	Shakespeare
ENGL 632	18th Century British Literature
ENGL 595	Topics in English (when topic is appropriate as approved by the Literature Coordinator)
ENGL 596	Topics in English (when topic is approved by the Literature Coordinator)
ENGL 695	Topics (when topic is appropriate as approved by the Literature Coordinator)
ENGL 790	Seminar in Textual Studies (Seminar in Textual Studies [when topic is appropriate as approved by the Literature Coordinator])
ENGL 791	Seminar in Literary Studies (Seminar in Literary Studies [when topic is appropriate as approved by the Literature Coordinator])
ENGL 795	Topics (when topic is appropriate as approved by the Literature Coordinator)

British Literature after 1800:

One course from: 3

ENGL 523	The Romantic Movement in Britain
ENGL 533	Victorian Literature

ENGL 538	The Twentieth-Century British Novel
ENGL 559	New Literatures in English
ENGL 641	19th Century British Literature
ENGL 642	Nineteenth-Century British Novel
ENGL 645	20th Century British Literature
ENGL 735	Postcolonial Literature and Theory
ENGL 595	Topics in English (when topic is appropriate as approved by the Literature Coordinator)
ENGL 596	Topics in English (when topic is appropriate as approved by the Literature Coordinator)
ENGL 695	Topics (when topic is appropriate as approved by the Literature Coordinator)
ENGL 790	Seminar in Textual Studies (Seminar in Textual Studies [when topic is appropriate as approved by the Literature Coordinator])
ENGL 791	Seminar in Literary Studies (Seminar in Literary Studies [when topic is appropriate as approved by the Literature Coordinator])
ENGL 795	Topics (when topic is appropriate as approved by the Literature Coordinator)

American Literature before 1870:

One course from:	3
ENGL 656	American Literature to 1810
ENGL 657	American Literature 1810-1870
ENGL 595	Topics in English (when topic is appropriate as approved by the Literature Coordinator)
ENGL 596	Topics in English (when topic is appropriate as approved by the Literature Coordinator)
ENGL 695	Topics (when topic is appropriate as approved by the Literature Coordinator)
ENGL 790	Seminar in Textual Studies (when topic is appropriate as approved by the Literature Coordinator)
ENGL 791	Seminar in Literary Studies (Seminar in Literary Studies [when topic is appropriate as approved by the Literature Coordinator])
ENGL 795	Topics (when topic is appropriate as approved by the Literature Coordinator)

American Literature after 1870:

One course from:	3
ENGL 541	American Travel Literature
ENGL 546	Studies in American Drama
ENGL 547	The American Novel to 1920
ENGL 548	The American Novel 1920 to Present
ENGL 565	African-American Literature
ENGL 566	Asian American Literature
ENGL 658	American Literature 1870-1946
ENGL 659	American Literature 1945-Present
ENGL 595	Topics in English (when topic is appropriate as approved by the Literature Coordinator)
ENGL 596	Topics in English (when topic is appropriate as approved by the Literature Coordinator)
ENGL 695	Topics (when topic is appropriate as approved by the Literature Coordinator)
ENGL 790	Seminar in Textual Studies (when topic is appropriate as approved by the Literature Coordinator)
ENGL 791	Seminar in Literary Studies (Seminar in Literary Studies [when topic is appropriate as approved by the Literature Coordinator])

ENGL 795	Topics (when topic is appropriate as approved by the Literature Coordinator)
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Methodology:

One course from:	3
ENGL 725	Scholarly Editing and Textual Scholarship
ENGL 730	The Digital Humanities
ENGL 735	Postcolonial Literature and Theory
ENGL 755	Critical Race Theory
ENGL 764	Theories of Literature
ENGL 790	Seminar in Textual Studies (when topic is appropriate as approved by the Literature Coordinator)
ENGL 791	Seminar in Literary Studies (Seminar in Literary Studies [when topic is appropriate as approved by the Literature Coordinator])
ENGL 795	Topics (when topic is appropriate as approved by the Literature Coordinator)

Seminar:

One course from:	3
ENGL 790	Seminar in Textual Studies
ENGL 791	Seminar in Literary Studies (Seminar in Literary Studies)

Free Electives 9

Note: Six hours must be from Literature courses

Total needed to graduate 30

Note: Of the total 30 hours needed to graduate no more than 12 hours can be at the 500 level

For any further questions regarding course offerings contact the Literature Advisor or the Graduate Program Director for the M.A. in English.

Professional Writing Option

Julia Romberger, Coordinator

Designed to prepare students to expand and theorize their practices of workplace writing and to prepare students for doctoral work in the field. This option requires:

ENGL 539	Writing in Digital Spaces	3
ENGL 685	Writing Research	3
ENGL 706	Visual Rhetoric and Document Design	3
ENGL 715	Professional Writing Theories and Practices	3
Select one of the following:		3
ENGL 686	Introduction to Rhetoric and Writing Studies	
ENGL 760	Classical Rhetoric and Theory Building	
ENGL 765	Modern Rhetoric and Theory Building	
Select one of the following:		3
ENGL 540	General Linguistics	
ENGL 550	American English	
ENGL 577	Language, Gender and Power	
ENGL 595	Topics in English	
Select one of the following:		3
ENGL 664	Teaching College Composition	
ENGL 665	Teaching Writing with Technology	
ENGL 680	Second Language Writing Pedagogy	
ENGL 720	Pedagogy and Instructional Design	
Select one of the following:		3
ENGL 527	Writing in the Disciplines	
ENGL 535	Management Writing	
ENGL 573	Writing with Video	

ENGL 581	Advanced Public Relations	
ENGL 595	Topics in English	
ENGL 662	Cybercultures and Digital Writing	
ENGL 664	Teaching College Composition	
ENGL 665	Teaching Writing with Technology	
ENGL 668	Graduate Internship and Project in Professional Writing	
ENGL 673	Discourse Analysis	
ENGL 680	Second Language Writing Pedagogy	
ENGL 686	Introduction to Rhetoric and Writing Studies	
ENGL 695	Topics	
ENGL 701	Texts and Technologies	
ENGL 716	International Professional Writing	
ENGL 720	Pedagogy and Instructional Design	
ENGL 760	Classical Rhetoric and Theory Building	
ENGL 765	Modern Rhetoric and Theory Building	
ENGL 766	New Media Theory and Practice I	
ENGL 771	New Media Theory and Practice II	
Six hours of electives		6
Total Hours		30

Portfolio Option:

As one of their oral exam options (the exam alone and thesis plus exam being the other two), students may choose to develop a portfolio as the capstone project for the MA in English professional writing option. Students choosing the portfolio will propose the scope of their individual projects to the graduate program director and the committee chair. Portfolios are a collection of individual texts with a meta-narrative that explains the connection between these texts and the portfolio's intellectual underpinnings. The entire portfolio should range between 10,000 and 15,000 words. Portfolios can be, but are not limited to, a collection of extensively revised course work, a collection of teaching materials, or a collection of new media texts. Portfolios can be submitted in a notebook or electronically. To help prepare the portfolio, students will be encouraged to take an independent study for up to 3 credits as one of their electives; the student's committee chair should direct this independent study.

Rhetoric and Composition Option

Kevin Moberly, Coordinator

Designed to prepare students to teach and administer writing in language arts, community college, or university contexts, and to prepare students for doctoral work in composition and/or rhetoric.

ENGL 539	Writing in Digital Spaces	3
ENGL 664	Teaching College Composition	3
ENGL 685	Writing Research	3
Select one of the following:		3
ENGL 686	Introduction to Rhetoric and Writing Studies	
ENGL 760	Classical Rhetoric and Theory Building	
ENGL 765	Modern Rhetoric and Theory Building	
Select one of the following:		3
ENGL 540	General Linguistics	
ENGL 550	American English	
ENGL 577	Language, Gender and Power	
ENGL 595	Topics in English	
Select one of the following:		3
ENGL 721	Compositions as Applied Rhetoric	
ENGL 760	Classical Rhetoric and Theory Building	
ENGL 765	Modern Rhetoric and Theory Building	
Select two of the following:		6
ENGL 527	Writing in the Disciplines	
ENGL 586	Media Law and Ethics	

ENGL 595	Topics in English	
ENGL 662	Cybercultures and Digital Writing	
ENGL 665	Teaching Writing with Technology	
ENGL 673	Discourse Analysis	
ENGL 680	Second Language Writing Pedagogy	
ENGL 687	Colloquium for Teachers of English	
ENGL 695	Topics	
ENGL 701	Texts and Technologies	
ENGL 706	Visual Rhetoric and Document Design	
ENGL 720	Pedagogy and Instructional Design	
ENGL 721	Compositions as Applied Rhetoric	
ENGL 760	Classical Rhetoric and Theory Building	
ENGL 763	Seminar in Discourse Analysis	
ENGL 765	Modern Rhetoric and Theory Building	
ENGL 766	New Media Theory and Practice I	
ENGL 771	New Media Theory and Practice II	
ENGL 795	Topics	
Six hours of electives		6
Total Hours		30

Portfolio Option:

As one of their oral exam options (the exam alone and thesis plus exam being the other two), students may choose to develop a portfolio as the capstone project for the MA in English rhetoric and composition option. Students choosing the portfolio will propose the scope of their individual projects to the graduate program director and the committee chair. Portfolios are a collection of individual texts with a meta-narrative that explains the connection between these texts and the portfolio's intellectual underpinnings. The entire portfolio should range between 10,000 and 15,000 words. Portfolios can be, but are not limited to, a collection of extensively revised course work, a collection of teaching materials, or a collection of new media texts. Portfolios can be submitted in a notebook or electronically. To help prepare the portfolio, students will be encouraged to take an independent study for up to 3 credits as one of their electives; the student's committee chair should direct this independent study.

Teaching of English Option

Tim Bostic, Coordinator

This option requires:

ENGL 600	Introduction to Research and Criticism	3
British Literature before 1800*		3
British Literature after 1800*		3
American Literature*		3
Pedagogy		
ENGL 555	The Teaching of Composition, Grades 6-12	3
or ENGL 664	Teaching College Composition	
ENGL 687	Colloquium for Teachers of English	3
Rhetoric		
ENGL 760	Classical Rhetoric and Theory Building	3
or ENGL 765	Modern Rhetoric and Theory Building	
Linguistics		3
Electives		6
*For a complete listing of courses to satisfy this specific option, see the complete course listing for the MA in Literature.		
Total Hours		30

Graduate Certificate in Literature

Easily completed in one calendar year, this certificate gives students who already hold at least a master's degree in a different field the 18 hours of graduate study in literature that are the minimum requirement for teaching that subject at the post-secondary level in Virginia. Requirements are:

British Literature before 1800	3
British Literature after 1800 *	3
American Literature	3
Electives in Literature **	9
Total Hours	18

* Or Post-colonial Literature and Theory.

** which may include ENGL 600 and ENGL 764.

NOTE: at least nine of the 18 hours must be at the 600-level.

Graduate Certificate in Professional Writing

Easily completed in one calendar year, this certificate is designed for professionals who want to supplement their undergraduate degrees and sharpen their writing and communication skills. To apply for the certificate contact the coordinator of Professional Writing.

Select four of the following: 12

ENGL 527	Writing in the Disciplines
ENGL 535	Management Writing
ENGL 539	Writing in Digital Spaces
ENGL 573	Writing with Video
ENGL 581	Advanced Public Relations
ENGL 583	Reporting and News Writing II
ENGL 584	Feature Story Writing
ENGL 585	Editorial and Persuasive Writing
ENGL 586	Media Law and Ethics
ENGL 664	Teaching College Composition
ENGL 665	Teaching Writing with Technology
ENGL 668	Graduate Internship and Project in Professional Writing
ENGL 685	Writing Research
ENGL 686	Introduction to Rhetoric and Writing Studies
ENGL 687	Colloquium for Teachers of English
ENGL 695	Topics
ENGL 715	Professional Writing Theories and Practices
ENGL 716	International Professional Writing
ENGL 760	Classical Rhetoric and Theory Building
ENGL 765	Modern Rhetoric and Theory Building
ENGL 766	New Media Theory and Practice I
ENGL 771	New Media Theory and Practice II

Total Hours 12

Graduate Certificate in the Teaching of Writing

Easily completed in one calendar year, this certificate gives students who already hold at least a master's degree in a different field the 18 hours of graduate study in the teaching of writing that are the minimum requirement for teaching that subject at the post-secondary level in Virginia. Requirements are:

Pedagogy	3
ENGL 664	Teaching College Composition
Rhetoric	3
ENGL 686	Introduction to Rhetoric and Writing Studies
ENGL 760	Classical Rhetoric and Theory Building
ENGL 765	Modern Rhetoric and Theory Building
Technology	3
ENGL 539	Writing in Digital Spaces
ENGL 665	Teaching Writing with Technology

Language	3
ENGL 540	General Linguistics (Language)
ENGL 542	English Grammar
ENGL 550	American English
ENGL 577	Language, Gender and Power
English electives in Rhetoric, Professional Writing, Journalism, Linguistics, or Creative Writing	6
Total Hours	18

NOTE: At least nine of the 18 hours must be at the 600-level.

Master of Arts - Applied Linguistics

Bridget Anderson, Graduate Program Director.

The Master of Arts in Applied Linguistics prepares students to pursue advanced graduate study or to teach in colleges, adult education programs, businesses, private schools, or institutions in the U.S. or abroad. The program's two emphases are Teaching English to Speakers of Other Languages (TESOL) and Sociolinguistics. Students in the program may also earn a certificate in TESOL and/or use appropriate courses in the program as requirements toward obtaining the Commonwealth of Virginia Endorsement for English as a Second Language.

Admission Information

In addition to general University admission requirements, applicants must have a grade point average of 3.0 or better, and must have taken at least 9 hours of upper-level English, linguistics, or foreign language courses. The Graduate Record Examination (GRE), General Test, is required of all applicants. International students must submit scores from the TOEFL iBT, (88 for regular admission and 80 for provisional admission) or from the TOEFL PBT (570 for regular admission and 550 for provisional admission), a sample of scholarly writing, and three recommendations, one of which evaluates proficiency in English. After 12 hours of graduate work, international students must meet the TOEFL requirement for regular admission.

Degree Requirements

The M.A. in Applied Linguistics requires 33 credit hours, and the passing of an oral comprehensive examination, and the completion of a language requirement (12 credits or the equivalent in a single foreign language; international students may meet the requirement based on English proficiency as measured by the TOEFL). No more than 12 hours may be taken on the 500 level. Courses taken PASS/FAIL are not included in the 33 credit hours.

Continuance

Students must:

1. meet all university and program requirements;
2. maintain a 3.0 grade point average or better;
3. retake any core course in which grades below B- are earned.

Exit

In order to graduate from the program, students must

1. complete the required course of study for a total of at least 33 credit hours of course work. Credit hours with grades below B- and courses taken PASS/FAIL are not included in the 33 credit hour total.
2. complete the language requirement by having 12 credits or the equivalent in a single foreign language; this can be at the undergraduate level; international students may meet the requirement based on English proficiency as measured by the TOEFL;
3. submit a program portfolio;
4. pass an oral comprehensive examination;
5. fulfill all university exit requirements.

Curriculum - TESOL Emphasis

ENGL 540	General Linguistics	3
ENGL 670	Methods and Materials in TESOL	3
ENGL 671	Phonology	3
ENGL 672	Syntax	3
ENGL 675	Practicum in TESOL	3
ENGL 679	First and Second Language Acquisition	3
Select three of the following:		9
ENGL 542	English Grammar	
ENGL 543	Southern and African American English	
ENGL 544	History of the English Language	
ENGL 550	American English	
ENGL 577	Language, Gender and Power	
ENGL 673	Discourse Analysis	
ENGL 674	Internship in Applied Linguistics	
ENGL 676	Semantics	
ENGL 677	Language and Communication Across Cultures	
ENGL 678	Sociolinguistics	
ENGL 695	Topics	
ENGL 705	Discourse and Rhetoric Across Cultures	
ENGL 770	Research Methods in Applied Linguistics	
ENGL 763	Seminar in Discourse Analysis	
ENGL 778	Seminar in Sociolinguistics	
Electives *		6
Total Hours		33

* Or a thesis approved by the graduate program director. In some cases, a 700-level course may be substituted for the corresponding 600-level course.

Sociolinguistics Emphasis

ENGL 540	General Linguistics	3
ENGL 550	American English	3
ENGL 671	Phonology	3
ENGL 672	Syntax	3
ENGL 673	Discourse Analysis	3
ENGL 678	Sociolinguistics	3
Select three of the following:		9
ENGL 544	History of the English Language	
ENGL 542	English Grammar	
ENGL 543	Southern and African American English	
ENGL 577	Language, Gender and Power	
ENGL 670	Methods and Materials in TESOL	
ENGL 674	Internship in Applied Linguistics	
ENGL 675	Practicum in TESOL	
ENGL 676	Semantics	
ENGL 677	Language and Communication Across Cultures	
ENGL 679	First and Second Language Acquisition	
ENGL 695	Topics	
ENGL 705	Discourse and Rhetoric Across Cultures	
ENGL 770	Research Methods in Applied Linguistics	
ENGL 763	Seminar in Discourse Analysis	
ENGL 778	Seminar in Sociolinguistics	
Electives *		6
Total Hours		33

* Or a thesis approved by the graduate program director. In some cases a 700-level course may be substituted for the corresponding 600-level course.

Master of Arts - Applied Linguistics Thesis Option

Writing a thesis may benefit those who contemplate further graduate work, as well as those who have a desire to pursue a single topic in depth. Under the guidance of a member of the graduate faculty, a student may earn six hours of credit for a completed approved thesis. Students who write a thesis will defend the thesis early in their final semester and complete their oral exam in a separate examination.

Master of Arts - Applied Linguistics Oral Comprehensive Examination

At the end of the program, all students must complete an oral comprehensive examination that covers each student's program of study and, where applicable, the thesis. Students who fail the oral comprehensive examination may take the test one more time in a different semester. Students who fail a second time will no longer be eligible to receive the Master of Arts degree in applied linguistics from Old Dominion University. One week before the oral examination, students must submit a portfolio that will include all course syllabi, major assigned papers and a reflection about the entire M.A. experience.

Graduate Certificate in Teaching English to Speakers of other Languages (TESOL)

This certificate may be of interest to students who want to teach English abroad or in the private sector. It includes five courses (some of which have ENGL 540 as a prerequisite):

ENGL 670	Methods and Materials in TESOL	3
ENGL 671	Phonology	3
ENGL 672	Syntax	3
ENGL 675	Practicum in TESOL	3
ENGL 677	Language and Communication Across Cultures	3
Total Hours		15

The certificate may be taken independently of the degree, but students must be admitted to the graduate program. A maximum of 6 semester hours of graduate credit may be transferred into the TESOL certificate program. This certificate does not provide a Commonwealth of Virginia endorsement in ESL.

Master of Fine Arts - Creative Writing

Luisa Igloria, Graduate Program Director

Website: <http://al.odu.edu/english/mfacw>

The Master of Fine Arts in creative writing is widely regarded as a terminal degree. It is designed to prepare students for careers as published writers in fiction, poetry, or creative nonfiction. A secondary goal is to emphasize not only preparation for college-level teaching (the practical vocational goal of most M.F.A. programs in creative writing), but also includes preparation of graduates for careers in literary editing and publishing, or as free-lance writers (magazines, newspapers, reviews, and features).

Admission

Applicants must have completed a bachelor's degree from an accredited institution with at least a 3.0 G.P.A., including a minimum of 24 credit hours in English with at least a B average. The Graduate Record Examination (GRE), General Test, is required of all applicants. Candidates must also submit writing samples in the genre for which they wish to be considered; final admission will depend on faculty evaluation of those writing samples. Students who have not completed 24 undergraduate credit hours in English

may be admitted provisionally and make up the required undergraduate courses.

Requirements

Students in the M.F.A. program must complete 54 total credit hours (39 hours of required courses and 15 hours of approved electives). In addition, students must also maintain a 3.00 GPA overall, satisfy a mid-program review at the end of the third semester in the program, and complete all work within three years (full-time students) or six years (part-time students). Students choose courses based upon their genre of study, and should consult the graduate program director or their advisor when selecting a schedule.

Students must take at least 12 credit hours of ENGL 650 (CREATIVE WRITING WORKSHOP), most of these in the genre area of concentration, to count toward core requirements for the degree.

ENGL 650	Creative Writing *	12
ENGL 660 or ENGL 661	Craft of Narrative or Craft of Poetry	3
Literature (select four of the following): **		12
ENGL 503	Medieval Literature	
ENGL 507	Chaucer's Canterbury Tales	
ENGL 516	English Renaissance Drama	
ENGL 521	British Literature 1660-1800	
ENGL 523	The Romantic Movement in Britain	
ENGL 533	Victorian Literature	
ENGL 538	The Twentieth-Century British Novel	
ENGL 546	Studies in American Drama	
ENGL 547	The American Novel to 1920	
ENGL 548	The American Novel 1920 to Present	
ENGL 559	New Literatures in English	
ENGL 560	The Literature of Fact	
ENGL 561	Poetry of the Early Twentieth Century	
ENGL 562	Sacred Texts as Literature	
ENGL 565	African-American Literature	
ENGL 566	Asian American Literature	
ENGL 592	Modern World Drama	
ENGL 593	Contemporary World Literature	
ENGL 595	Topics in English	
ENGL 615	Shakespeare	
ENGL 632	18th Century British Literature	
ENGL 641	19th Century British Literature	
ENGL 645	20th Century British Literature	
ENGL 655	Topics in World Literature	
ENGL 656	American Literature to 1810	
ENGL 657	American Literature 1810-1870	
ENGL 658	American Literature 1870-1946	
ENGL 659	American Literature 1945-Present	
ENGL 681	Contemporary Classics: The Thesis Reading List	
ENGL 683	Literary Editing and Publishing	
ENGL 791	Seminar in Literary Studies	
ENGL 695	Topics (The following course is specifically recommended for MFA Creative Writing students: 695 Topics: The Thesis Reading List.)	
ENGL 694	Thesis Colloquium ***	3
Students must complete 3-9 Thesis Hours to complete curricular requirements in the program		9
ENGL 698	Thesis Research	
ENGL 699	Thesis	

Electives +	15
Total Hours	54

- * These are the Graduate Creative Writing Workshops in Fiction, Poetry, and Nonfiction; course may be repeated up to 6 times with 3 different topics.
Cross-genre experience is recommended (taking ENGL 650 Creative Writing Workshops in a concentration other than the student's major), but ONLY after the first year in the program. Instructor approval must be sought.
- ** No more than 12 hours of courses at the 500 level may be counted toward the degree.
- *** Should be taken in the last semester of the second year, or the first semester of the third year.
- + Additional Creative Writing Workshops, additional American, British, or World Literature Courses, or courses in other fields (approved in advance by GPD) that may count toward Electives ~ MFA Creative Writing students may also elect to take ENGL 596 Topics: Writing Tutorial (1 credit), which offers the opportunity to work in tutorials with the program's Visiting Writer in Residence. Three (3) of these 1-credit ENGL 596 Writing Tutorial courses are equivalent to one Elective (3 credits) in the MFA Creative Writing curriculum.
Students in *their first year* of the program, especially those with GTAs/GAAs/RAAs, are strongly encouraged to take as one of their Electives, ENGL 664 The Teaching of College Composition; this course is typically a requirement for any teaching assistantship assignments in the classroom.

Master of Fine Arts in Creative Writing Thesis

All candidates for the M.F.A. in creative writing must complete a thesis manuscript of publishable quality in their chosen genre (poetry, fiction, or creative nonfiction). Each student will select an advisor from the graduate faculty and work with that advisor and a committee of readers to prepare the manuscript. At the completion of the thesis, students will schedule an oral defense with the advisor and the committee, at which point the thesis will be adjudged as to its readiness for final acceptance, printing, and binding.

Master of Science in Education - English

Refer to the Darden College of Education section of this Catalog (p. 100).

Doctor of Philosophy - English

Kevin DePew, Graduate Program Director

The Ph.D. in English is an innovative program that integrates writing, rhetoric, discourse, technology, literary, and textual studies. Offering opportunities for creative reinterpretation of these fields within the discipline of English, the program emphasizes research that examines texts in a variety of overlapping and sometimes competing language-based worlds. Our focus is on how the creation and reception of texts and media are affected by form, purpose, technology of composition, audience, cultural location, social practices, and communities of discourse. Students may pursue full- or part-time study through a combination of on-campus and distance learning courses. There are four emphasis: 1) Writing, Rhetoric, and Discourse Studies; 2) Literary and Cultural Studies; 3) Technology and Media Studies; and 4) Student-created emphasis (must be approved by the graduate program director). This program prepares students for academic careers, as well as other careers in which reading and writing figure prominently; the program also helps students professionalize within their current careers.

Admission Information

Applications are accepted for entrance in fall semester only and must be submitted no later than February 1. Late applicants not applying for financial assistance may be considered until March 15, but only if openings remain after the first round of decisions. Applications submitted after March 15 will not be considered. Applicants residing in other countries should mail materials well in advance of those dates. All required forms and

documents should be sent directly to the Office of Graduate Admissions. Applications packets are available online at the Office of Graduate Admissions website. The following should be submitted along with the appropriate applications forms: 1) a 1500-word statement of the applicant's academic and professional goals and discussion of how the Ph.D. in English will contribute to the achievement of those goals; 2) three letters of reference from sources capable of commenting on the applicant's readiness for advanced graduate study in English; 3) a 15-20 double-spaced-page writing sample on a topic related to the applicant's projected plan of study; 4) a resume or curriculum vitae; 5) GRE general exam scores (taken within the last five years). The GRE score is not optional nor can another test substitute for it.

Admission standards include the following, which are required, unless otherwise stated: 1) A completed master's degree (or its equivalent) in English or in an appropriate field (such as rhetoric, composition, English education, communications, journalism, linguistics, science, or technology) from a regionally accredited institution of higher education; 2) A minimum grade point average (GPA) of 3.5 (on a 4.0 scale) overall for the master's degree; 3) A score in the 70th percentile or higher on the verbal and writing sections of the GRE General Exam (recommended); 4) For students whose first language is not English, a current score for the Test of English as a Foreign Language (TOEFL) of at least 600 on the paper version, 250 on the computer-based version, or 80 on the iBT version. Students without at least some significant background in an English-related field are encouraged to take master's level coursework in English before applying.

Degree Requirements

The Doctor of Philosophy degree in English requires 48 credit hours (39 credit hours of course work and 9 credit hours of dissertation), completion of a research competency, and the passing of a candidacy examination and an oral defense of the dissertation. An identifiable unifying principle is required for each student's program.

Curriculum

ENGL 810	Major Debates in English Studies	3
ENGL 840	Empirical Research Methods and Project Design	3
ENGL 892	Dissertation Seminar	3
Emphasis 1 *		9
Emphasis 2 *		9
Electives **		12
ENGL 899	Dissertation	9
Total Hours		48

* Students are allowed to take only one English 897 per emphasis with a total of two different sections of English 897 for the entire course of study.

** Students are allowed to take one course at the 600-level towards their course of study.

Emphasis Courses

(18 credit hours)

Students will choose two nine-hour emphases from those described below. NOTES:

A. Some courses appear in multiple emphases, but the same course cannot be counted toward the required nine hours in multiple emphases. (No "double-dipping" is allowed.)

B. An emphasis is defined by a minimum of three courses, but students are free to select additional courses from their emphasis areas as electives (see below, ELECTIVES).

C. Students who choose the "Student-Designed Emphasis" as one of their two emphases MUST follow the process for defining it specified in the description below in order for courses they take to constitute an emphasis.

D. Students may count only one "Student-Designed Emphasis" toward the requirement to complete two emphases. That is, all students must select as

least one of the pre-defined disciplinary emphases, but all students may also design their own emphasis according to the process stipulated below.

1. Emphasis: Literary and Cultural Studies

The Literary and Cultural Studies emphasis will teach students to apply a range of methodologies to the study of literature and other textually informed cultural practices. Although the emphasis includes course offering intensive study of specific literary-cultural topics (such as Victorian Gothic or Women & Indian Film), the emphasis aims more to professionalize students as experts in the methods of critical traditions of literary, textual, and cultural interpretation than to credential students as specialists in particular literary-cultural periods. By the conclusion of their studies in this emphasis, students will be proficient in interpreting texts and cultural practices by critically employing methodologies that include:

- Theories of Form, such as the technical protocols of scholarly editing and the physical description of manuscript and printed texts.
- Critical Theories such as New Historicism, Feminism, Queer Theory, and Poststructuralism.
- Cultural Theories such as Critical Race Theory, Mass/Popular Culture Theory, and Post Colonial Studies.

ENGL 801	Texts and Technologies	3
ENGL 805	Discourse and Rhetoric Across Cultures	3
ENGL 825	Scholarly Editing and Textual Scholarship	3
ENGL 830	The Digital Humanities	3
ENGL 835	Postcolonial Literature and Theory	3
ENGL 864	Theories of Literature	3
ENGL 890	Seminar in Textual Studies	3
ENGL 891	Seminar in Literary Studies	3
ENGL 895	Topics (when appropriate for emphasis)	3

2. Emphasis: Rhetoric, Writing, and Discourse Studies

This emphasis prepares students for placement and advancement in careers centered on the history and theory of rhetoric, composition, writing program administration, workplace studies, and/or rhetorical and linguistic approaches to discourse and culture. It emphasizes how communications are composed, constructed, and produced as well as how they affect (inter) personal, social, cultural, and political situations. Possible areas of inquiry include:

- Institutional assessment procedures for writing and critical thinking
- Writing practices and language use in a variety of educational, public, professional, and workplace settings
- The influence of institutional, cultural, and disciplinary assumptions about language and language users upon rhetorical and linguistic choices.
- The rhetorical constraints and strategies of underrepresented groups.
- The historical development of rhetoric and composition and professional writing in terms of theory, practice, and instruction.

ENGL 801	Texts and Technologies	3
ENGL 805	Discourse and Rhetoric Across Cultures	3
ENGL 806	Visual Rhetoric and Document Design	3
ENGL 815	Professional Writing Theories and Practices	3
ENGL 816	International Professional Writing	3
ENGL 820	Pedagogy and Instructional Design	3
ENGL 821	Compositions as Applied Rhetoric	3
ENGL 860	Classical Rhetoric and Theory Building	3
ENGL 863	Seminar in Discourse Analysis	3
ENGL 865	Modern Rhetoric and Theory Building	3
ENGL 878	Seminar in Sociolinguistics	3
ENGL 883	Seminar in Professional Writing	3
ENGL 893	Seminar in Rhetoric	3
ENGL 895	Topics (when appropriate for this emphasis)	3

3. Emphasis: Technology and Media Studies

The study of technology as a political, cultural, economic, systematic, and aesthetic force is a crucial area of analysis in contemporary scholarship. This emphasis prepares students for interdisciplinary work with a focus on domains of technological complexity with foundations in the materiality of rhetorical work. A major tenet of this emphasis is that in addition to studying issues of technology, society, communication, and media design, we also develop practical solutions for the situations we confront. This emphasis prepares students for both academic and industry positions where they can use their skills as researchers and strategists. Possible areas of research and application include:

- Ethical, social, and political dimensions of information, technology, and networked communication
- Copyright and intellectual property, including the legal implications of technological regulation and change
- Privacy issues in information technologies and media
- Implications of digital methods in the humanities
- Design and development of digital humanities tools
- Technologically mediated communication such as experience design, usability studies, and information architecture
- Visual and participatory cultures

ENGL 806	Visual Rhetoric and Document Design	3
ENGL 830	The Digital Humanities	3
ENGL 866	New Media Theory and Practice I	3
ENGL 871	New Media Theory and Practice II	3
ENGL 894	Seminar in New Media	3
ENGL 895	Topics ((when appropriate to emphasis))	3

4. Student Designed Emphasis

A student-designed emphasis is a coherent cluster of at least three courses that are not included in the other emphasis chosen by the student. The courses selected must define a cross-curricular focus that is clearly different from the foci of the pre-defined disciplinary emphases listed above.

Examples might include methodology; pedagogy; gender studies; visual rhetoric; discourse and rhetoric across cultures; or professional writing for international contexts. Students should construct emphases under the guidance of an advisor, with advice from other mentors as needed. Students must submit a proposal for the emphasis that includes a title, a description of the focus, and a tentative or exemplary selection of at least three courses. Both the advisor and the GPD must approve the proposal and place a signed approval letter in the student's advising file. Because course offerings may change, a final description of the emphasis (including a title, a description of the focus, and a justification of how courses taken support the focus) must be approved by the student's advisor (in a signed letter) and submitted with the letter to the GPD before the student enrolls in ENGL 892 Dissertation Seminar.

Electives

(12 credit hours)

The remaining four courses are electives, which may include additional courses in the student's chosen emphases, course in other emphases, or other 800-level courses from other programs. Students are encouraged to select electives that contribute to defining a coherent area of specialization or subfield. Note: Students and advisors should select a pedagogy course when students' previous work experience or course work does not prepare them for instructional activities related to their field.

Dissertation Seminar

(3 credit hours)

Taken in the semester of the student's candidacy examination, this course supports students in preparing their dissertation prospectus. It sets up writing groups for cohorts of students entering the dissertation stage of their graduate studies.

Dissertation Credits

(minimum of 9 credit hours)

A dissertation is required of all Ph.D. students. A dissertation prospectus will be submitted after the student's successful completion of the candidacy exam. If the student's proposed dissertation committee approves the prospectus, the student will proceed to research and write the dissertation. An oral defense of the dissertation will be scheduled after a draft of the completed dissertation is approved by the student's dissertation committee.

Research Competency

Because the Ph.D. is a research degree, all students are expected to present evidence of mastery of a basic research competency over and above the usual course work. Students select one of the following three options to meet this requirement:

Foreign Language

To enter candidacy for the doctoral degree, students may present evidence of mastery of a foreign language equivalent to second-year undergraduate facility. This can be done by transcript, by demonstration of native language proficiency (for those who speak English as a second language), by taking coursework at Old Dominion or elsewhere equivalent to second-year language facility (at Old Dominion University, through language courses numbered 202), by passing a standardized test at the appropriate level, or by passing an examination administered by the Department of Foreign Languages geared to second-year language mastery. A grade of B or above in both semesters of second-year instruction will demonstrate competency in that language. Evidence of completion of the foreign language requirement should be presented to the GPD as soon as possible in the student's career and certainly before enrolling in the Dissertation Seminar.

New Media Application

Students may choose the option of presenting evidence of mastery of computer and new media applications beyond the usual knowledge of word processing, spread sheets, projection applications (e.g., PowerPoint), portable document format (pdf), and similar, common applications and software. This would include programming languages such as

- InterDev
- PERL
- JavaScript
- C#
- PHP
- CSS/XML
- Ruby

In lieu of standardized examinations to test such knowledge, students choosing this option must submit a multimodal, new-media project in which demonstration of one of the allowed programming languages is paramount. The project should include:

- a project proposal for approval,
- a project log,
- 3 versions (revisions) of a portfolio of self-produced material,
- a statement of which applications or programs one is presenting and level of expertise,
- and, if needed, a demonstration of facility before members of the Ph.D. Advisory Council, which shall have final say on whether the option has been satisfied.

Projects should be multimodal and interactive. As with seeking credit in a foreign language, students should submit evidence of completion of the requirement to the GPD as soon as possible in their careers and certainly before enrolling in the Dissertation Seminar.

Statistics

Students whose research requires advanced knowledge of quantitative research design and statistics may show mastery of statistical methods through the following:

- Successful completion of one graduate-level course in statistics with a grade of B or higher (courses completed as part of the student's master's

degree may count for this requirement). Courses offered at ODU that may fulfill this requirement include:

- STAT 613
- FOUN 722

OR

- Successful completion of two undergraduate-level courses in quantitative research design and statistics with a grade of B or higher in both courses.

AND

- Providing evidence to the GPD that they designed and completed a project using statistical methods (e.g., a course project, conference paper, or journal article).

Candidacy Exams

After students have completed all course requirements and research requirements, they must pass a written examination related to their chosen field. Exams are designed in consultation with an examination committee approved by the graduate program director of English, and they are directed toward the critical or scholarly project the student plans to pursue in the dissertation. Students who fail the written exam will not be allowed to submit their dissertation proposal or to begin work on their dissertation. The written exam may be retaken only once and no earlier than the semester following the student's initial attempt.

Grade Requirements

All Ph.D. students will be graded on the traditional A, B, C, F scale (with pluses and minuses) in all courses. Pass/Fail evaluations will be used only in the case of registration for internships or for thesis or dissertation research, or when specifically approved by the director. Graduate students whose grade point averages fall below 3.00 (B) will be placed on a probationary status. After two consecutive semesters below this average or the accumulation of two grades of "C" or below, the graduate program director and the Ph.D. advisory committee may dismiss the student from the doctoral program.

Time Limit and Continuance

Students will be required to complete and successfully defend a dissertation prospectus two years after the student passes the Dissertation Seminar, English 892. Students who take/pass the candidacy exam the spring after English 892 will have two years from the last day of the exam. Students, however, can appeal for an extension by completing the department form. For this form to be approved, students will need to submit 1) a letter to the English PhD Advisory Council that explains the reasons for needing an extension, the length of the extension, and what the student will do during this time to complete and successfully defend the prospectus and 2) a letter from the dissertation director supporting or dismissing the appeal. The English PhD Advisory Council will consider the student's appeal and make a decision. If the English PhD Advisory Council does not accept the appeal, the student may be dismissed from the program; this decision is final. If the student does not complete the work according to the approved plan, the student will be dismissed from the program.

Similarly, students will be required to complete, successfully defend, and deposit a dissertation eight years after entering the program. Students, however, can appeal for an extension by completing the university form "Exception to Time Limits Allowed to Complete PhD Degree (D8)." For this form to be approved, students will need to submit 1) a letter to the English PhD Advisory Council that explains the reasons for needing an extension, the length of the extension, and what the student will do during this time to complete, successfully defend, and deposit the dissertation and 2) a letter from the dissertation director supporting or dismissing the appeal. The English PhD Advisory Council will consider the student's appeal and make a decision. If the English PhD Advisory Council does not accept the appeal, the student may be dismissed from the program; this decision is final. If the appeal is approved, the student will need to re-validate courses that had been taken eight years prior; this should be reflected in the student's

proposed plan. If the student does not complete the work according to the approved plan, the student may be dismissed from the program.

Transfer Credit

Twelve graduate hours not used to fulfill the requirements of a degree at other institutions or at Old Dominion University may be applied toward the fulfillment of degree requirements. Transfer credit is accepted as degree credit at the discretion of the graduate program director.

Financial Aid

Full-time students are eligible to apply for university fellowships and teaching and research assistantships, which are awarded on a competitive basis.

Nondegree Students

Nondegree students may not register in doctoral-level English courses.

Additional Information

Additional information is available on the English Department website.

Department of History

8000 Batten Arts and Letters Building
757-683-3949

Austin Jersild, Chair

Master of Arts - History

Maura Hametz, Graduate Program Director

The Department of History offers courses of study leading to the Master of Arts with a major in history.

Admissions

Applicants must meet all University requirements and regulations for admission. Their applications must include a short essay of 500 words or less, addressing their academic interests and goals, and two letters of recommendation. The Graduate Record Examination (GRE), General Test, is required for all applicants.

An undergraduate major or minor in history is desirable but is not required for admission. Generally, 18 semester credit hours in history and closely related cognates are sufficient for admission on a provisional basis. These credit hours should include survey and upper-level courses. The graduate program director may prescribe certain undergraduate courses to be completed before recommending admission to the program. Under certain circumstances, students can be admitted to graduate courses while simultaneously completing an undergraduate prerequisite.

The requirement for admission to full standing (regular status) is 24 semester credit hours with an average of at least 3.00 in history and a general GPA of 3.00. Provisional admission requires 18 credits (as described above) with an average of 3.00 in history and a GPA of 2.70. Students with averages below these minimums can attempt to improve their standing in undergraduate courses approved by the graduate program director. However, they cannot be admitted to graduate courses until they have achieved acceptable averages in history. Applicants who are denied admission to the M.A. program in history are not permitted to enroll in history graduate courses as non-degree students.

Prospective applicants with questions about their admission status should contact the graduate program director in the Department of History. Those certain of their qualifications should apply through the Office of Admissions.

Admissions forms should reach Old Dominion University well in advance of the intended term of entry, but no later than November 1 for spring admission and April 1 for summer or fall. All required forms and documents should be sent directly to the Admissions Office, which creates a central file for each applicant. Only the one-page application for graduate financial assistance along with a duplicate copy of the 500-word essay should be sent directly to the graduate program director.

Graduate Financial Aid

Old Dominion University offers financial assistance to qualified graduate students. Types of aid include research and teaching assistantships, fellowships, grants, scholarships, and part-time employment. Nearly all forms of aid require that the student be engaged in full-time graduate study.

Fellowships, assistantships, tuition grants, and small research grants may be available. Departmental funds may affect fellowship and assistantship amounts. The establishment of student need and academic promise also affect some grant amounts. The application deadline is February 15. International students must pass the SPEAK test (or an equivalent) of spoken English to become eligible for teaching assistantships.

Degree Requirements

Two courses of study are available. One is a 30-credit program capped by written comprehensive examinations in two general fields and an oral examination. The other is a 30-credit program, comprising 24 hours of course work, a thesis for which students earn six credits (HIST 698-HIST 699) on a pass/fail basis, and an oral examination. Either alternative leads to an M.A. in history.

All candidates for the M.A. in history must meet the general graduate degree requirements established for the University. In addition, all students must complete HIST 600 during their first year in the program. No more than nine of the required 30 hours may be earned in 500-level courses. Students are permitted a maximum of six credits in other departments offering graduate courses if the work is germane to their historical studies; prior approval of the graduate program director is required. Students who have received two grades of C+ or below will be indefinitely suspended from the program. Those students whose grade point average falls below 3.00 will be subject to the University's probation/suspension policy.

Curriculum

Examination Option

Students pursuing the exam option must take course work as follows:

30 credits total: Hist 600 Historical Theory and Praxis (3 credits), 24 credits of Hist 500, 600, or 700 level classes thereof at least 6 credits American History and 6 credits Non-American History, and Hist 675 Exam Preparation (3 credits).

Students choose two fields of concentration for the Examination Option, which will conform to the expertise of two of the three committee members who constitute the student's exam committee. The fields can be tailored to the following geographic areas: North America, Europe, Russia, Latin America, Asia, or Africa.

Students pursuing the examination option must complete HIST 675 during their last year in the program. Written comprehensive field examinations may be taken in conjunction with HIST 675. The two field exams are taken during a designated time over the course of two weeks with a two-hour oral examination following the completion of written exams. Exams are individualized by the student's examining committee but competence in the entire field is essential. Examinations are completed no later than 30 days before the end of a semester, and thus are normally scheduled in March, July, and November. A field exam is judged in its entirety and is rated Pass or Fail by the examining committee; the same is true of the oral examination. Students who fail an exam can be re-examined in the next scheduled round of exams. Only one re-examination is permitted.

Thesis Option

Students pursuing the thesis option must take course work as follows:

30-36 credits total: Hist 600 Historical Theory and Praxis (3 credits), 21 credits of Hist 500, 600, or 700 level classes thereof at least 6 credits American History and 6 credits Non-American History, Hist 698 Thesis (3-6 credits) and Hist 699 (3-6 credits).

The thesis option will be recommended for those students who have maintained a high GPA and have the support of a faculty director. A review of the thesis prospectus is required before the completion of 18 hours of course work. The master's thesis is written under the direction of a thesis

advisor selected by the candidate in consultation with the graduate program director. The thesis is reviewed and the candidate examined by a faculty committee chaired by the thesis advisor. The thesis defense—normally a two-hour oral examination—focuses on the thesis, the historical context, and related aspects of the student's concentration. Final approval of the thesis is the responsibility of the thesis advisor, the graduate program director, and ultimately of the dean of the College of Arts and Letters, who certify the candidate for graduation.

Institute of Humanities

3041 Batten Arts and Letters
757-683-3821

Master of Arts - Humanities

Avi Santo, Graduate Program Director

The Institute of Humanities at Old Dominion University offers a Master of Arts in Humanities in the College of Arts and Letters. The program, which promotes interdisciplinary studies with an emphasis on critical theory and cultural studies, allows students to pursue individualized programs of study that incorporate classes from across departments within the college. Students in the program are encouraged to develop their curricular and extra-curricular activities around one of two thematic anchors: the digital humanities and/or humanities in the Hampton Roads. Each student works closely with the program director to create an appropriate program of study.

Admission

The Humanities master's program is open to all qualified holders of a B.A. or B.S. and is designed for full-time or part time students, students who have recently completed their bachelor's degree, as well as nontraditional or adult students. Although admission is selective, the Humanities program recognizes that each individual has unique qualifications that should be taken into consideration.

In addition to meeting general University requirements, an applicant must have an undergraduate average of 3.25 overall, as well as 24 hours in liberal arts disciplines. All students seeking admission to the humanities program are required to submit recent GRE scores. Although admission is selective, the University recognizes that each individual possesses unique qualifications that will be taken into consideration. An essay of 500 words must be submitted with the application material. The essay should

1. Propose a general program of study
2. Discuss personal, intellectual, and professional goals
3. Explain the relationship of those goals to the intended program of study

All application inquiries should be made to the Office of Admissions.

Requirements

Once students gain admission to the program, they may pursue the 36-hour thesis option or the non-thesis option. All students must take HUM 601, HUM 602, HUM 603, HUM 604, and HUM 692. Thesis students enroll in HUM 698 or HUM 699; non-Thesis students enroll in HUM 693. Students may only take 12 hours at the 500 level. Students are required to complete their graduate work within a 6-year period.

Curriculum

All students must take the following five required courses. These courses provide an introduction to humanities research, critical theory (601) and methods (602), ongoing debates about the future of the humanities in a digital era (604), introduce students to interdisciplinary research and teaching (603), and serve as a foundation for each student's individualized program of study. HUM 692 prepares students for their final project.

HUM 601	Introduction to the Humanities	3
HUM 602	Theory and Methods in Humanities	3
HUM 603	Preparing Humanities Teachers & Scholars Pro-seminar	3
HUM 604	Debates in the Digital Humanities	3

HUM 692	Humanities Thesis and Non-Thesis Preparation	3
Total Hours		15

Thesis Option

Students pursuing the thesis option must take HUM 698-HUM 699 (thesis, six hours). The thesis is to be based on original scholarly research and should reflect the interdisciplinary nature of the humanities degree. Each student will choose a faculty advisor who will chair a thesis committee appointed by the director of the Humanities Institute. The thesis committee will direct and evaluate the student's work and consists of faculty members from at least two different Arts and Letters disciplines. Upon completion of the thesis, the committee will conduct an oral examination and student defense of the thesis. A formal written statement explaining and justifying the project must be submitted by the student before the oral examination.

Non-thesis Option

Students selecting the non-thesis option must take the capstone seminar, HUM 693. Students have the option of creating a theoretically informed final project instead of a traditional thesis. Individual projects must be approved by the program director, but can include creative works, art installations, film and video, interactive and born-digital works, as well as other forms of community engagement.

M.A. Emphasis Areas

The Master of Arts in Humanities is interdisciplinary in focus. Choosing from more than 70 graduate-level courses offered through various departments of the College of Arts and Letters each semester, students may select their own emphasis and design a program in order to meet their own intellectual and professional objectives, or they may select a pre-approved concentration with a more structured program of study. Students will work closely with the program director to design a coherent program of study that encourages critical thinking, individual vision and dynamic scholarship. Together, the student and program director design an emphasis area that is comprised of courses from across the disciplines and fields in the College of Arts and Letters. These include art history, linguistics, literature, foreign languages and cultures, history, international studies, music, philosophy, political studies, geography, sociology, anthropology, communication, film studies, and women's/gender studies.

Focalization Areas

The Institute is currently developing strength areas in the digital humanities and humanities in the Hampton Roads, around which we hope to generate grant funded collaborations and graduate student resources. These areas are also intended to serve as thematic anchors that students carry with them across their individualized and interdisciplinary course of study, providing grounded opportunities for students to develop coherent programs of study within the Institute's flexible curriculum. These areas of focalization also provide opportunity for students taking varied courses to form community.

Visual Studies Concentration

The Master of Arts in Humanities –Visual Studies Concentration emphasizes interdisciplinary studies, and allows students to pursue individualized programs of study. In addition to the core courses in the Humanities and one core course in Art (*Visual Arts Across Media and Time*), a curriculum comprised of studies in Art Education, Art History, Studio Art can be combined with courses in other disciplines housed in the College of Arts and Letters. These include Communication, English, Philosophy, History, Foreign Languages, Music and Performing Arts, Women's Studies, Sociology, Geography, Political Science, and International Studies.

At the center of the Visual Studies Concentration course of study is the required *Visual Arts Across Media and Time* seminar course. This course is an introduction to and overview of creative, curricular, and research activities in contemporary art, design, art education, and art history. Through lectures, readings, Students will gain an overview of creative theory and practice in contemporary art, design, art education, and art history. Through written research assignments they will gain critical and analytical skills that will broaden their concepts about art and culture. Through class studio

projects, they will acquire an immediate awareness of, and experience in, creative process production while enhancing their hands-on artistic skills. The overview of the different disciplines (Art Education, Art History, and Studio Art) will guide students to selecting their own research direction in the Visual Studies track. discussion, and creative work, students will engage with ideas and artwork across a broad spectrum of contemporary art education, process, investigation, and production. Faculty lecturers representing different areas in the art programs (Art Education, Art History, Art Studio) will provide insights into theory and practice in their disciplines. Lectures and readings will introduce significant concepts, figures, and works in the respective fields. Through creative written and studio projects, students will explore research activities and develop their personal skills

The degree requires 36-hours in Thesis and Non-Thesis (Project) options.

Those who intend to pursue teaching positions at the Community College or 4-year College/University level must complete at least 18 hours in the intended discipline

Admission Requirements

Studio Art

For those intending to pursue studies in studio art, the submission of a portfolio of five examples of the applicant's work in the area of intended concentration (Fine Arts, Prints, Graphic Design) is required.

Art History

For those intending to pursue studies in art history, the submission of a writing sample is required. The writing sample should demonstrate your ability to research and write a scholarly paper on a topic in Art History. The paper should be no more than ten pages in length and must be fully referenced according to a professional, scholarly style manual.

Women's Studies Certificate

A Women's Studies Certificate is available to graduate students through the Institute of Humanities (in association with the women's studies program) upon completion of the following 15-hour program of course work:

WMST 560	Feminist Theory	3
WMST 570	Feminist Research Methods	3
At least 9 additional credits in 500 or 600-level courses *		9
Total Hours		15

* Courses approved for the women's studies curriculum and drawn from various disciplines (such as English, history, political science and geography, foreign languages, art history, women's studies, etc.). No more than six of these credits may be taken in any one field. At least one of the courses chosen must be on the 600 level.

Only students who hold a B.A. or B.S. degree with an overall GPA of 2.80 may apply for the graduate women's studies certificate. Students must maintain a 3.00 grade point average in the 15 graduate credits needed for the certificate. The women's studies certificate may be undertaken independently or in combination with a graduate degree in humanities (or in combination with another graduate degree). Students wishing to pursue the certificate through the Institute of Humanities must gain admission to the humanities graduate program before the completion of nine graduate hours and must satisfy all of the admission requirements for the program including the GRE.

The director of the women's studies program or a designee will serve as advisor for students who gain admission to the humanities program only for the purpose of pursuing the graduate women's studies certificate. Students pursuing the certificate in combination with a graduate degree in the humanities will have their progress monitored by both a women's studies advisor and the director of the Institute of Humanities.

Accelerated Programs

The Institute of Humanities offers several BA/BS-MA accelerated degree programs, through which ODU undergraduate students can apply classes

toward an MA in the Humanities and obtain a graduate degree within one additional year of study.

Current accelerated degree programs include:

- Communication
- Cultural Geography
- Philosophy
- Visual Studies
- Women’s Studies

For additional information please contact the Institute of Humanities at: <http://al.odu.edu/hum/>.

International Studies

7045 Batten Arts and Letters
757-683-5700

Regina Karp, Graduate Program Director

Old Dominion University offers M.A. and Ph.D. degrees in international studies through the Graduate Program in International Studies (GPIS).

GPIS is an interdisciplinary unit, offering advanced research and graduate training in global problems and transnational issues. Fields of concentration include: U.S. foreign policy and international relations, conflict and cooperation, international political economy and development, interdependence and transnationalism, and comparative and regional studies, modeling and simulation, and cultural studies.

Master of Arts—International Studies

Admission Requirements

1. All candidates for admission into the M.A. must submit Graduate Record Examination (GRE) scores;
2. Official transcripts of all undergraduate or prior graduate course work submitted directly by all universities attended;
3. Two letters of recommendation addressing the candidate’s capacity to undertake graduate work in international/global issues;
4. An essay of not more than 500 words describing interest in and capacity for advanced training in global/transnational issues; and
5. One example of writing or research (a paper submitted to a seminar, a publication or report, or another comparable example).

Any prior graduate course work taken at Old Dominion University (e.g., in nondegree status) or at another institution can be counted toward the M.A. degree only in accordance with the provisions governing transfer of credit and the director’s approval.

Admission Standards

1. All applicants to the M.A. program must hold a baccalaureate degree or equivalent.
2. Candidates for the M.A. must attain a 3.00 cumulative GPA in all undergraduate courses. A GRE score of 146 Quantitative, and 156 Verbal is normally expected. (1100 Old Score).
3. Individuals whose native language is not English must submit a score of 230 on the computer-based TOEFL (the equivalent of 570 in the older, paper-based score scale) or 80 on the TOEFL iBT.

Application Deadline, M.A.

Applications for fall semester admission to the M.A. program and for financial assistance must be submitted to the Office of Graduate Admissions no later than February 15. Applications for spring semester admission to the M.A. program (only) are accepted on a limited basis and must be submitted to the Office of Graduate Admissions by October 15.

Degree Requirements

Credits for the M.A.

The M.A. requires 33 credits, of which at least 27 must be at the 600 level or above. The required course work for all M.A. students includes the basic methodology course (IS 600), but does not include any courses needed for demonstrating foreign language competency. M.A. candidates writing theses will incorporate into their 33-credit program six credits of directed research on the thesis. Students pursuing a non-thesis track will take a four and 1/2 hour comprehensive examination after the completion of their course work.

Curriculum

All GPIS Students, both MA and PhD, will NOT be allowed to take more than 9 credit hours per semester. All M.A. and Ph.D. students must take IS 600, Research Methods; IS 655, International History OR IS 606, American Foreign Policy and World Order; ECON 650, International Economics; and IS 601, International Relations Theory. Each required course must be completed with a grade of B (3.00) or above. M.A. students must fulfill the requirements of nine credit hours in one field of concentration.

Required Courses, M.A. in International Studies Course List

IS 600	Research Methods in International Studies	3
IS 601	Seminar in International Relations Theory	3
ECON 650	International Economics	3
Select one of the following:		3
IS 606	American Foreign Policy and World Order	
IS 655	International History	
Field of concentration		9
Electives*		12
IS 698	Directed Research	
or IS 699	Thesis	
Total Hours		33

* If thesis option, 6 of these credits will be directed research. Up to six credits of elective coursework may be taken at the 500 level.

Fields, Area/Region, Methodology, Language and Foreign Experience Requirements

Fields of concentration include U.S. foreign policy, conflict and cooperation, international political economy and development, interdependence and transnationalism, comparative and regional studies, modeling and simulation, and cultural studies.

Methodology Requirements

The M.A. requires one methodology course (IS 600). M.A. students are encouraged to take further methods courses as electives.

Language Requirements

M.A. students must demonstrate reading competence in one foreign language other than English. International students who have English as a second language fulfill this requirement.

Foreign language competence can be demonstrated in one of two ways:

1. Students may complete a third year of language instruction at Old Dominion University (students may choose to enter the third year through a University placement test) or other institutions. A grade of B or above in both semesters of third-year instruction will demonstrate competency in that language.
2. Students may take a language test. Exams are administered (for a fee) by the Department of Foreign Languages and Literatures. GPIS requirements concern reading comprehension competence. For more information about which skills will be tested and what standards of competency are required, contact GPIS. If a student wishes to demonstrate competency in an uncommonly taught language, GPIS will endeavor, so far as practicable, to arrange an examination by Old Dominion University faculty and/or consultants. For more information

about this method for demonstrating language competency, contact GPIS.

Comprehensive Examinations

In consultation with their advisors, M.A. students will select either a thesis or non-thesis option. Students selecting the non-thesis track must pass a written comprehensive examination. Thesis students must pass an oral defense of their thesis.

The M.A. comprehensive examination may not be scheduled before students have completed all core and methodology requirements, nor may the M.A. comprehensive examination be scheduled prior to the last semester in which regular course work is taken. M.A. examinations are scheduled twice a year. If M.A. students fail the written comprehensive on the first attempt, they may retake the entire written comprehensive exam only once, no earlier than one semester later.

Theses

M.A. students choosing the thesis option will submit a thesis prospectus to the chair of their thesis committee for approval after the completion of 18 credits or at the beginning of the third semester in the program. The thesis should be submitted to the thesis committee for its approval at least two weeks before a defense is scheduled. The committee will schedule the student's oral defense of the thesis when the thesis appears to meet GPIS standards for master's theses. The oral defense will concern questions of substance and methodology.

Grade Requirements

All M.A. students will be graded on the traditional A, B, C, F scale (with pluses and minuses) in all courses. Pass/Fail evaluations will be utilized only in the case of registration for internships or for thesis or dissertation research, or when specifically approved by the director.

Graduate students for whom grade point averages fall below 3.00 (B) will be placed on a probationary status. After two consecutive semesters below this average or the accumulation of two grades of "C" or below, the director will take under consideration, in consultation with faculty, termination of the student's program.

Time Limit and Residency Requirements

The master's degree can be completed in four full-time semesters, although many M.A. candidates continue the degree over a longer period on a part-time basis. The M.A. must be completed within a six-year period.

Additional Information

Please see the GPIS Handbook and website at al.odu.edu/gpis. For other issues concerning GPIS, please contact:

Graduate Program in International Studies (GPIS)
7045 Batten Arts and Letters Building
Old Dominion University
Norfolk, VA 23529-0086, USA
Telephone: 757-683-5700
Fax: 757-683-5701
E-mail: isgpd@odu.edu ([//isgpd@odu.edu](http://isgpd@odu.edu))

Doctor of Philosophy-International Studies

Admission Requirements

All candidates for admission into the Ph.D. must submit:

1. Graduate Record Examination (GRE) scores;
2. Official transcripts of all undergraduate or prior graduate course work submitted directly by all universities attended;
3. Three letters of recommendation (at least two of which should be from prior professors) addressing the candidate's capacity to undertake graduate work in international/global issues;
4. An essay of not more than 500 words describing interest in and capacity for advanced training in global/transnational issues; and

5. One example of writing or research (a paper submitted to a seminar, a publication or report, or other comparable example).

Any prior graduate course work taken at Old Dominion University (e.g., in nondegree status) or at another institution can be counted toward the Ph.D. degree only in accordance with the provisions governing transfer of credit and the director's approval.

Admission Standards

1. Applicants to the Ph.D. program must hold a master's degree in a related field of study.
2. Ph.D. candidates are generally expected to attain a GRE score of 148 Quantitative and 160 Verbal (1200 Old Score) and have at least a 3.00 cumulative GPA in undergraduate and graduate courses, with a somewhat higher GPA for courses related to international, global or transnational issues.
3. Individuals whose native language is not English must submit a score of 230 on the computer-based TOEFL (the equivalent of 570 in the older, paper-based score scale) or 80 on the TOEFL iBT.
4. The Admissions Committee strongly recommends prior international experience (residence, study or work) and foreign language training for all Ph.D. applicants. Evidence of substantial international and foreign language background is highly desirable for applicants.

Application Deadline, Ph.D.

Applications for fall semester admission to the Ph.D. program and for financial assistance must be submitted to the Office of Graduate Admissions no later than January 15.

Degree Requirements

The Ph.D. requires 78 credits, which must include 48 hours at the post-master's level (i.e., courses at the 800 level). These 48 hours include a minimum of 12 and a maximum of 18 dissertation credits. The 78 credits do not include any courses needed for demonstrating foreign language competency. Each student's program of study is supervised by a faculty committee.

Upon completion of coursework, Ph.D. students must pass a written and an oral comprehensive examination, submit a dissertation prospectus, write a dissertation, and undergo an oral defense of the dissertation.

Curriculum

Required Courses, Ph.D. in International Studies

All Ph.D. students must take:

IS 600	Research Methods in International Studies	3
IS 606	American Foreign Policy and World Order	3
or IS 655	International History	
ECON 650	International Economics	3
IS 601	Seminar in International Relations Theory	3
IS 620	Advanced Statistical Techniques for International Studies	3
Total Hours		15

Each required course must be completed with a grade of B (3.00) or above. Ph.D. students must take 15 credit hours in one field of concentration and nine credit hours from another field, totaling 24 credit hours. They must also take 6 hours of elective coursework. Twelve to 18 credit hours of dissertation preparation credits must be taken to complete the credit hour requirement of 48 hours at the post-masters level.

Fields, Area/Region, Methodology, Language and Foreign Experience Requirements

Fields of concentration include U.S. foreign policy, conflict and cooperation, international political economy and development, interdependence and transnationalism, comparative and regional studies, modeling and simulation, and cultural studies.

Methodology Requirements

All Ph.D. students must complete a sequence of two basic methods courses beginning with IS 600. Students holding an M.A. from another institution who are entering the Ph.D. program may present transcripts showing a B (3.00) or above, plus syllabi and other documentation, from a similar introductory methods course to be exempted from IS 600.

Language Requirements

Ph.D. students must demonstrate reading competence in one foreign language other than English. International students who have English as a second language fulfill this requirement.

Foreign language competence can be demonstrated in one of two ways:

1. Students may complete a third year of language instruction at Old Dominion University (students may choose to enter the third year through a University placement test) or other institutions. A grade of B or above in both semesters of third-year instruction will demonstrate competency in that language.
2. Students may take a language test. Exams are administered (for a fee) by the Department of Foreign Languages and Literatures. GPIS requirements concern reading comprehension competence. For more information about which skills will be tested and what standards of competency are required, contact GPIS. If a student wishes to demonstrate competency in an uncommonly taught language, GPIS will endeavor, so far as practicable, to arrange an examination by Old Dominion University faculty and/or consultants. For more information about this method for demonstrating language competency, contact GPIS.

Comprehensive Examinations

All Ph.D. students must pass a written comprehensive examination. Students who pass the written comprehensive examination must then pass an oral comprehensive examination.

The Ph.D. comprehensive examination may not be scheduled before students have completed all core and methodology requirements, nor may the Ph.D. comprehensive examination be scheduled prior to the last semester in which regular course work is taken. Ph.D. students are also required to fulfill the foreign language requirement before taking the comprehensive examination. Ph.D. examinations are scheduled twice a year. Ph.D. students failing the written comprehensive on the first attempt may retake the written comprehensive exam only once, no earlier than the following semester.

Dissertations

A dissertation is required of all Ph.D. students. A dissertation prospectus will be prepared after the successful completion of the comprehensive examination. If the student's graduate committee approves the prospectus, the student will proceed to research and write the dissertation. An oral defense of the dissertation will be scheduled after a draft is approved by the committee.

Grade Requirements

All Ph.D. students will be graded on the traditional A, B, C, F scale (with pluses and minuses) in all courses. Pass/Fail evaluations will be utilized only in the case of registration for internships or for thesis or dissertation research, or when specifically approved by the director.

Graduate students for whom grade point averages fall below 3.00 (B) will be placed on a probationary status. After two consecutive semesters below this average or the accumulation of two grades of "C" or below, the director will take under consideration, in consultation with faculty, termination of the student's program.

Time Limit and Residency Requirements

The doctoral program must be completed within eight years of entry into Ph.D. course work.

Transfer Credit

Twelve graduate credits earned at other institutions or at Old Dominion University may be applied toward the fulfillment of degree requirements. Transfer credit, including nondegree credit earned at Old Dominion, is accepted as degree credit at the discretion of the director.

Financial Aid

Full-time students are eligible to apply for University fellowships, teaching and research assistantships, and tuition grants which are awarded on a competitive basis.

Nondegree Students

Nondegree students must obtain the approval of the director before enrolling in graduate international studies classes.

Graduate Certificates

Graduate Certificate in International Studies and Women's Studies

Students seeking to combine international studies and women's studies may complete the 15-credit program leading to the certificate in Women's Studies, which is offered in cooperation with the Institute of Humanities and the Women's Studies Program. Students should contact the director of women's studies at (757) 683-3823 for information.

Graduate Certificate in Modeling & Simulation in International Studies

The Graduate Program in International Studies (GPIS) offers a certificate in modeling and simulation.

Program Requirements

Twelve credit hours are required to complete the certificate.

Introductory Course(s):	3
MSIM 601	Introduction to Modeling and Simulation
Core Courses (select from the following) *	9
ENMA 712/812	Multi-Criteria Decision Analysis and Decision Support Systems
ENMA 724/824	Risk Analysis
IS 762/862	Game Theory
IDT 755/855	Theory and Design of Instructional Simulation
IDT 756/856	Instructional Gaming: Theories and Practice
IS 765/865	Agent-Based Modeling and Simulation for International Studies
IS 762/862	Game Theory
MSIM 772/872	Modeling Global Events
Total Hours	12

* Other courses may be included from across the University's modeling and simulation programs with approval of the track coordinator.

Additional Information

Please see the GPIS Handbook and website at al.odu.edu/gpis. For other issues concerning GPIS, please contact:

Graduate Program in International Studies (GPIS)
7045 Batten Arts and Letters Building
Old Dominion University
Norfolk, VA 23529-0086, USA
Telephone: 757-683-5700
Fax: 757-683-5701
E-mail: isgpd@odu.edu ([//isgpd@odu.edu](http://isgpd@odu.edu))

Department of Music

244 Diehn Fine and Performing Arts Center
757-683-4061

John Toomey, Chair

Master of Music Education, M.M.E.

Nancy K. Klein, Graduate Program Director

The College of Arts and Letters offers the Master of Music Education degree with concentrations in applied performance/conducting, research, or seminar option. The graduate degree is designed to stress the development of advanced knowledge of broad-based principles and practices in music and music education for application in the public or private school, private studio, or higher education setting. A minimum of 34-37 semester hours of course work is required to complete the degree, with the hours distributed according to the area of concentration. The degree does not provide Virginia state licensure for teaching.

Admission

In order to be admitted into the graduate program each candidate must have earned a bachelor's degree in applied music, music education, music history, or music theory and have earned an overall GPA of 3.0 with a 3.0 in the major field of study. All candidates are required to take the GRE or the MAT. Candidates seeking the concentration in applied studies are required to audition before the graduate faculty. Video and audio-taped auditions are accepted.

Degree Requirements

The three areas of concentration for the Master of Music Education degree are:

1. Applied Studies, requiring 34 hours of course work and full master's recital in performance or conducting
2. Research, requiring 34 hours of course work and a thesis or problems paper
3. Seminar Option, requiring 37 semester hours of course work

Before the completion of 12 credits, each candidate must declare an option of study. Those accepted into the applied option must pass an applied jury or performance presented before the graduate faculty for continuance review during each semester of study. Students in all areas of concentration must pass a written comprehensive examination near the completion of their studies.

The following courses are required for each concentration option:

MUSC 603	Principles of Music Education	3
MUSC 604	Foundations of Music Education	3
MUSC 600	Introduction to Graduate Research (Taught concurrently with MUSC 603)	1
MUSC 630	Research in Music Education	3
Total Hours		10

Additional course requirements are specific to the concentration option:

APPLIED STUDIES CONCENTRATION

Additional required courses:

MUSA 651	Advanced Applied Music	3
MUSA 652	Advanced Applied Music	3
Select one of the following:		3
MUSC 605	Literature of the Wind Ensemble	
MUSC 606	Choral Music Literature	
MUSC 609	Literature of the Orchestra	
Select one of the following:		3
MUSC 560	History of Jazz	

MUSC 566	Modern Music	
MUSC 591	Music in the Baroque Era	
MUSC 592	Music in the Classical Era	
MUSC 594	Music in the Romantic Era	
Total Hours		12

RESEARCH CONCENTRATION

Additional required courses:

MUSC 698	Thesis Research	3
MUSC 699	Thesis	3
Total Hours		6

SEMINAR OPTION

Additional required courses:

Select one of the following:		3
MUSC 560	History of Jazz	
MUSC 566	Modern Music	
MUSC 591	Music in the Baroque Era	
MUSC 592	Music in the Classical Era	
MUSC 594	Music in the Romantic Era	
Select one of the following:		3
MUSC 605	Literature of the Wind Ensemble	
MUSC 606	Choral Music Literature	
MUSC 609	Literature of the Orchestra	
Total Hours		6

The remainder of the course work for each option will be chosen from course offerings in the Department of Music.

Department of Political Science and Geography

7022 Batten Arts and Letters Building
757-683-3849

Dr. Francis Adams, Director of Geography, Chief Departmental Advisor

Certificate in Spatial Analysis of Coastal Environments (Undergraduate and Graduate)

The certificate in spatial analysis of coastal environments provides an interdisciplinary program for students wishing to pursue careers in coastal management or research, remote sensing, or geographic information system (GIS) applications. Rendered upon completion of the requirements, the certificate is an academic affidavit comprised of courses in geography and ocean, earth, and atmospheric sciences, and is administered by the two departments. Students must take courses in the areas listed below and complete them with a cumulative GPA of 3.00 or higher and no grade below a C (2.00). The certificate is available to postgraduate professionals who meet the requirements. Students with comparable professional experience may be able to show competence in selected courses through examination.

Students seeking undergraduate certification must complete the 400-level courses, and those seeking graduate certification must complete the 500-level courses:

Core courses:

GEOG 404/504	Digital Techniques for Remote Sensing	3
Select one of the following:		3-5
BIOL 419/519	Wetland Plants	
BIOL 450/550	Principles of Plant Ecology	
OEAS 411/511	Structural Geology	
OEAS 426/526	Concepts in Oceanography for Teachers	

Interpretive Analysis Courses:

Select two of the following:	6
GEOG 402/502 Geographic Information Systems	
GEOG 422W/522 Coastal Geography	
GEOG 490/590 Applied Cartography/GIS	
OEAS 495/595 Special Topics	
Capstone Seminar:	
GEOG 419/519/ Spatial Analysis of Coastal Environments	3
OEAS 419/519	
<hr/> Total Hours	15-17

Department of Sociology and Criminal Justice

6000 Batten Arts and Letters Building
757-683-3794

Randy Gainey, Chair

Master of Arts - Applied Sociology

Dianne Carmody, Graduate Program Director

The Master of Arts degree in Applied Sociology emphasizes research skills necessary in many professions. The M.A. degree may serve as professional training for students seeking employment in federal, state and local government agencies or in private-sector organizations. In addition, the M.A. program provides excellent training in the fundamentals of sociology for students who wish to pursue a Ph.D. in the social sciences.

The program provides students with training in theory and methods, as well as opportunities to participate in three areas of specialization:

1. General sociology
2. Criminal justice
3. Women's studies

Admission

Students must hold a bachelor's degree with at least a 3.00 average on a 4.00 scale and must have completed at least 12 hours of undergraduate work in sociology or criminal justice, including courses in theory, research methods, and statistics. The Graduate Record Examination is required for all applicants.

Those who fail to meet one or more of the above requirements may be admitted as provisional students by the graduate program committee.

Deadlines

This program admits students in the fall semester only. February 15 is the deadline for students applying for funding (Graduate Assistantship). Students who do not wish to apply for funding must apply by March 1. All students must submit original application materials directly to Old Dominion University's Graduate Admissions Office.

Requirements

All students must complete 30 hours of course work including five required core courses (15 credit hours):

SOC 610	Applied Social Research Methods	3
SOC 620	Proseminar in Sociological Theory	3
SOC 630	Applied Social Statistics	3
SOC 640	Sociological Application of Computer and Data Analysis	3
SOC 650	Research Seminar	3
<hr/> Total Hours		15

Each student must also complete a thesis (six credit hours), which will be supervised by a faculty committee from the department.

Any student earning less than a B in a required core course will be required to repeat that course. If the student earns less than a B in the second attempt, that student will be dismissed from the program.

Sociology Track

In addition to the core course requirements listed above, students choosing the sociology track must complete 15 credit hours of electives chosen from graduate sociology courses offered by the Department of Sociology and Criminal Justice, Old Dominion University. Selection of elective courses will be based upon individual advising.

Criminal Justice Track

In addition to the core course requirements listed above, students choosing the criminal justice track must complete CRJS 625 and 12 credit hours of electives chosen from graduate criminal justice courses offered by the Department of Sociology and Criminal Justice, Old Dominion University. Selection of elective courses will be based upon individual advising.

Women's Studies Track

In addition to the requirements listed above, students choosing the women's studies track must complete WMST 560 and WMST 570 and nine credit hours of electives chosen from selected graduate women's studies courses and/or courses cross-listed with women's studies. No more than six hours of these credits can be taken in any one discipline (sociology and criminal justice are considered two separate disciplines). Selection of elective courses will be based upon individual advising. Students will be awarded the Certificate in Women's Studies upon completion of the Master of Arts degree.

Curriculum

Required Core Courses:

SOC 610	Applied Social Research Methods	3
SOC 620	Proseminar in Sociological Theory	3
SOC 630	Applied Social Statistics *	3
SOC 640	Sociological Application of Computer and Data Analysis *	3
SOC 650	Research Seminar **	3
<hr/> Total Hours		15

* Prerequisite: SOC 610

** Prerequisites: SOC 610, SOC 620, SOC 630, SOC 640.

Criminal Justice Track:

CRJS 625	The Administration of Criminal Justice	3
Electives		12
<hr/> Total Hours		15

Women's Studies Track:

WMST 560	Feminist Theory	3
WMST 570	Feminist Research Methods	3
Electives		9
<hr/> Total Hours		15

Electives Courses:

A variety of graduate elective courses in sociology and criminal justice are offered every semester. All courses are 3 credit hours. Recent elective courses include the following:

- Social Inequalities
- Globalization, Justice and Human Rights
- Violence Against Women
- Criminological Theory and Public Policy
- Cultural Adaptations
- Drugs and Society

- Diversity and the Criminal Justice System
- American Jury
- Community Justice
- Crime in the Workplace
- Life Course Perspective on Crime and Deviance
- Criminal Justice and the Law

Doctor of Philosophy – Criminology & Criminal Justice

Dawn L. Rothe, Graduate Program Director (GPD)

<http://al.odu.edu/sociology/phdprogram>

The Ph.D. in Criminology and Criminal Justice is a sociological criminology program that highlights social inequality and public policy in the study of crime and justice issues. The program produces scholars with strong backgrounds in the substantive areas of criminology, criminal justice, theory, inequality, and policy as well as in research methods and statistics. Designed primarily for students who are interested in pursuing careers in higher education, the course offerings also provide students the education and skills needed to be employed as researchers in public and private agencies. Graduates are prepared as scholars able to conduct research, teach college and university courses in their areas of specialization, and to provide service to the discipline and community.

Regular Admission Requirements

1. A completed master's degree (or its equivalent) in criminology, criminal justice, or in an appropriate field (e.g., administration of justice, sociology, or political science) from a regionally accredited institution of higher education – a thesis is generally expected;
2. A minimum grade point average (GPA) of 3.25 (on a 4.0 scale) overall for the master's degree;
3. The Graduate Record Examination (GRE) is required of all applicants;
4. Successful completion of prior coursework in research methods and statistics at least equivalent to that required by the ODU B.A. in sociology/criminal justice and M.A. degree in applied sociology (research methods, statistics, computer and data analysis);
5. Three letters of reference from sources capable of commenting on the applicant's readiness for advanced graduate study in criminology & criminal justice;
6. A writing sample of at least 20 double-spaced pages on a topic related to the applicant's expertise or area of interest;
7. A typed statement of approximately 1,000 words summarizing the individual's motivation for applying to the program as well as the professional contributions s/he intends to make assuming successful completion of the degree;
8. If the applicant's native language is not English, a current score for the Test of English as a Foreign Language (TOFEL) of at least 540 and/or an interview in which the applicant's comprehension and fluency in English can be assessed.

Conditional Admission

Provisional admission may be granted on rare occasions when an applicant's credentials suggest aptitude for doctoral study but do not meet the criteria outlined above. Admission under this standard requires a variable amount of preliminary coursework in addition to that which is normally required for the degree. The amount and content of additional coursework required for conditional admissions is determined by the Ph.D. Committee on a case-by-case basis.

Students who have an appropriate undergraduate degree and a law degree (J.D.) but lack graduate work in the social sciences will normally be required to complete 18 hours of graduate work as follows: 12 hours in theory, research methods, social statistics, computer statistical applications, and 6 hours of substantive courses.

International Students

Graduate international students on non-immigrant visas whose native language is not English or who have not lived in the U.S. ten years must provide evidence of English language proficiency through one of the following:

1. Submission of a minimum required TOEFL score or successful completion of Old Dominion University's Graduate Bridge Program,
2. Possession of an American Bachelor's or Master's degree equivalent from an accredited institution located in a country where English is the native language,
3. GRE verbal score of 480.

Non-degree seeking students must secure permission from the GPD prior to registering for doctoral classes in the program.

Deadlines

January 15 – Students applying for funding (Graduate Assistantship) and fall admission; there is no spring admission. All students must submit all original application materials directly to Old Dominion University's Graduate Admissions Office. Students requesting funding (Graduate Assistantship) must submit the Application for Graduate Financial Assistance to the Program Director.

Degree Requirements

The Ph.D. in Criminology & Criminal Justice requires a minimum of 48 credit hours at the post-master's level (i.e., courses at the 700 to 800 level) as detailed below. Students must maintain a cumulative GPA of at least 3.25. In addition, each of the core courses must be completed with a grade of B or better. The core courses may be taken a maximum of two times. Students who receive two grades of B- or below in any course, or whose grade point average falls below a 3.25 will be dismissed from the program.

Coursework

Core Courses

CRIM 800	Proseminar in Criminology and Criminal Justice	3
CRIM 801	Criminology and Public Policy	3
CRIM 802	Advanced Criminological Theory	3
CRIM 803	Inequality, Crime and Justice	3
CRIM 890	Professional Development and Dissertation Seminar	3

Research Skills

CRIM 805	Multivariate Statistics in Criminological Research	3
CRIM 810	Qualitative Methods in Criminology and Criminal Justice	3
CRIM 815	Advanced Quantitative Techniques in Criminology & Criminal Justice	3
CRIM 820	Advanced Research Methods in Criminology & Criminal Justice	3

Electives 12

Dissertation Credits 9

CRIM 899	Dissertation	9
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Continuous Enrollment

CRIM 999	Criminology 999	1
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Total Hours 58

Comprehensive Examinations

The comprehensive exam assesses a student's expertise of the literature in criminology and criminal justice (in terms of both breadth and depth) in theory, research methods and statistics, inequality and policy as applied to questions of criminological interest; and her/his ability to think broadly and critically and to present her/himself as a sophisticated intellectual thinker. Preparation for the comprehensive exam gives students the opportunity to

organize their knowledge of the field as gained from coursework, their own independent readings, teachings, and research.

The written comprehensive exam is taken by students following completion of all coursework except the dissertation seminar; students may petition the Ph.D. Committee to take the exam prior to the completion of all coursework. The written exam will be in a take-home format distributed during August. Details about the structure of the exam will be announced to students by the end of the spring semester before the exam. Student names will be removed from the exams for grading. No more than three faculty members will grade each section of the exam as “pass” or “fail” and more than one negative vote from the exam committee will result in a failure of the section. Students may pass or fail the exam in whole or in part. Students need to retake only those sections that are failed. Students who fail any section of the exam may register for fall classes but must retake the failed section in accordance with the directions stipulated by the comprehensive exam committee, generally in late November/early December of that same year. Students who do not successfully pass the written comprehensive exam following the retake will be dismissed from the program; they may complete the classes they are enrolled in that semester for credit if they wish. Students may not defend a dissertation proposal until they have passed the written comprehensive exam.

Admission to Candidacy

A student is admitted to candidacy for the degree once the following criteria are satisfied:

- S/he has completed all Ph.D. coursework (excepting dissertation hours) with a GPA of at least 3.25;
- S/he has successfully passed the comprehensive examinations;
- S/he has successfully defended a dissertation prospectus.

The Dissertation

The dissertation is a scholarly work investigating a problem of significance and should constitute a meaningful contribution to the body of existing knowledge regarding matters of criminology and criminal justice policy or practice. It is the culmination of a program of advanced study leading to a doctoral degree and, as such, is expected to demonstrate a high level of scholarly competence. It must show that the candidate is capable of conceptualizing and conducting sophisticated original research, as well as analysis and reporting on an approved topic related to crime and justice by use of accepted scientific methods. Complete information about the dissertation is found on the program’s website.

Department of Women's Studies

3041 Batten Arts and Letters Building
(757) 683-3823
Jennifer Fish, Chair

Graduate Certificate in Women’s Studies

Women’s Studies is a multi- and interdisciplinary field of study encompassing all aspects, historical and contemporary, of women’s natures, lives, and perspectives. A Graduate Certificate in Women’s Studies can expand a student’s future career opportunities within a variety of fields; it can also prepare students for exciting and innovative research in master’s or doctoral programs.

For those who want to pursue only the Graduate Certificate in Women’s Studies, they must hold either a B.A. or B.S. degree with an overall GPA of 2.80 OR a graduate degree.

Those admitted to a graduate program have the option of earning a Graduate Certificate in Women’s Studies in conjunction with a graduate degree from another department or college. Students must satisfy all admission requirements for their chosen graduate program before completing the courses required for the Graduate Certificate in Women’s Studies. Please consult the chair of the Women’s Studies Department and the relevant sections of the Catalog for additional information.

The chair of Women’s Studies or a designate will serve as advisor for students pursuing the Certificate. Students pursuing the Certificate in

combination with another graduate degree will have their progress monitored by both a Women’s Studies advisor as well as an advisor from their graduate program.

The Certificate will be awarded upon completion of the following program of courses.

Certificate Requirements

Students must maintain a 3.00 GPA in the 15 credit hours required for the Certificate.

Required Courses

WMST 560	Feminist Theory	3
WMST 570	Feminist Research Methods	3
Additional Courses ^{*/**}		9-12
Total Hours		15-18

* Additional courses must be 500- or 600-level courses approved for the Women’s Studies curriculum and drawn from various disciplines (e.g., Art History, English, History, Humanities, International Studies, Philosophy, Political Science & Geography, Sociology & Criminal Justice, Women’s Studies, etc.) At least one of the courses must be a 600-level course. With the exception of Women’s Studies courses, students may not take more than six credit hours in any single field.

** Students planning to teach Women’s Studies courses at the post-secondary level in Virginia must complete an additional three credit hours, for a total of 18 credit hours, in order to meet accreditation requirements.

Centers and Institutes

Center for Family Violence Education and Research

The Old Dominion University Center for Family Violence Education and Research (CFAVER) is an interdisciplinary group of professionals with a common interest in empowering communities with education and information concerning family violence. The center’s aim is to educate and promote an understanding of the various forms of family violence, including child abuse, sibling abuse, partner abuse, and elder abuse. Strategies to increase awareness about these problems include conducting interdisciplinary research focusing on different types of family violence, developing public awareness campaigns to educate members of the public about family violence, evaluating programs and processes used with family violence victims and offenders, and building relationships with various agencies responsible for family violence case care.

Institute for Ethics and Public Affairs

The Institute for Ethics and Public Affairs seeks to raise awareness and stimulate discussion of the ethical dimension of matters of public concern within the campus community and the larger Hampton Roads community; to strengthen moral community and foster a commitment to ethical ideals in public life; to facilitate reflection on the ethical standards that govern the professions; and to highlight the unique and valuable contribution that philosophical reasoning can make to practical decision making.

Institute for the Study of Race and Ethnicity

In support of the mission of Old Dominion University to place special emphasis upon understanding the perspectives of women, minorities, and non-Western cultures, the Institute for the Study of Race and Ethnicity (ISRE) seeks to develop, promote and implement academic, research and public service programs that focus on the study of race and ethnicity in the region, the nation, and globally. The political, social, economic, and cultural experiences of African Americans, Filipino Americans and other communities of color are emphasized in the work of the institute. ISRE seeks to establish itself as a major archive and research center in Virginia and the southeastern region of the United States by providing archival resources

through its Resource Center and engaging in the collection, analysis, and dissemination of data and research.

Institute of Asian Studies

Old Dominion University seeks to promote an expanded awareness and understanding of the nations and cultures of Asia, to support and encourage research on Asia, and to make resources available to foster better understanding and more effective interaction between organizations and individuals in the Hampton Roads area and those in Asia. To achieve these goals, the Institute of Asian Studies coordinates special programs and administers a major and minor in Asian studies. It also facilitates cooperative relationships with higher education institutions and other organizations within the United States and throughout Asia. The institute director works closely with the Office of International Programs regarding scholarships and study abroad programs and opportunities.

The Institute for Jewish Studies and Interfaith Understanding

In 2002, with a \$300,000 matching grant from the Dudley Cooper Trust, Old Dominion University announced the establishment of an Institute for Jewish Studies and Interfaith Understanding dedicated to the idea that interfaith understanding involves both an appreciation of Judaism's historic role in the development of Western civilization and an understanding of the cross-cultural development of the world's religions. To this end, the institute coordinates lectures, symposia and reading groups related to Jewish history and thought as well as Judaism's continuing dialogue with Christian, Islamic, and Asian faith traditions. Presenting information about the world's religious and ethnic diversity in a University setting of open dialogue to thoughtful students, young and old, can enrich overall understanding of the issues and challenges that confront us in the twenty-first century.

Strome College of Business

www.odu.edu/business

2004 Constant Hall
Old Dominion University
Norfolk, VA 23529

(757) 683-3520

Vinod Agarwal, Interim Dean
Ali Ardalan, Associate Dean for Internal Affairs
Kiran Karande, Associate Dean for Executive Programs and External Affairs

Ph.D:

- Business Administration
- Public Administration and Urban Policy

Master's:

- Accounting (M.S.)
- Business Administration (M.B.A.)
- Computer Science (M.S.)
- Economics (M.A.)
- Public Administration (M.P.A.)

Certificates:

- Maritime, Ports and Logistics Management (Also available online)
- Advanced Certificate in Public Administration and Policy
- Modeling and Simulation
- Public Procurement and Contract Management(Also available online)

Overview

Old Dominion University's Strome College of Business has as its principal objective the preparation of liberally educated specialists who will enter the challenging world of business or public administration. All programs in the college are designed to promote the following: professional competence; facility in the communication arts; analytical skills; leadership abilities; an understanding of social, political, and economic forces; and, a strong sense of business ethics and public purpose. This foundation enables graduates of these programs to advance in a broad range of careers in the public and private sectors.

The Strome College of Business is one of approximately 469 schools in the world to have achieved accreditation for business programs on the graduate and undergraduate levels by the Association to Advance Collegiate Schools of Business - International (AACSB). The Master of Science in accounting program has received its own accreditation through the same agency. In addition, the Master of Public Administration program is one of approximately 164 graduate programs certified as meeting the standards of the National Association of Schools of Public Affairs and Administration (NASPAA).

The college offers master's degrees in accounting, business administration, economics, and public administration. Also, the college offers a joint master's degree in computer information science with the Computer Science Department. The college also offers a Ph.D. program in business administration and a Ph.D. program in public administration and urban policy.

Also housed within the college is the Department of Military Science and Leadership. The mission of this department is to provide professional instruction and leadership development for selected students who desire to serve in the active or reserve components of the U.S. Army. Additional information about this program may be obtained through the Military Science and Leadership Department.

Vision Statement

The vision of the Strome College of Business is to be recognized as an innovative leader in business and public administration education and to become a valued center of excellence in the mid-Atlantic coast region.

Mission Statement

The college's mission is to develop students, within a global and ethical context, for successful careers in business and government; to perform basic, applied and pedagogical research; and to offer services to the community; all of which support the economic development of Hampton Roads and beyond.

Graduate School of Business and Public Administration

Gilbert R. Yochum, Dean
Ali Ardalan, Associate Dean for Internal Affairs

Kiran Karande, Associate Dean for Executive Programs and External Affairs

The Graduate School of Business and Public Administration offers six degree programs: Master of Arts in Economics; Master of Business Administration; Master of Public Administration; Master of Science in Accounting; Ph.D. in Business Administration—finance, information technology, management, or marketing tracks; and Ph.D. in Public Administration and Urban Policy. In addition, the school offers a master's in computer information science option jointly with the Computer Science Department.

Graduate courses are taught during the day and in the evening facilitating flexible combinations of formal learning and full- or part-time employment. Students come from a variety of backgrounds with undergraduate degrees from many different colleges and universities.

All graduate students are advised to check specific program requirements before enrolling in 400/500 level courses. Nondegree graduate students must satisfy the admission index for graduate study or receive special permission from the graduate program director in the Strome College of Business in order to enroll for graduate credit.

Graduate Certificate in Public Procurement and Contract Management

Stephen B. Gordon, Program Director

This certificate program is designed for students to satisfy their elective requirements or it can be taken as a stand alone certificate program. This certificate program is designed for Public Administration graduate students, however, business administration students, engineering students, and students from other disciplines would also be eligible to participate in the program. The program consists of four required courses and one elective (15 credits total).

Admission Requirements

Admission to the certificate program will require a bachelor's degree (or equivalent).

Program Requirements

The award of this certificate is based upon the student's successful completion of 15 credit hours of graduate level courses in Public Administration:

PPCM/PADM 718	Public Sector Contract Administration	3
PPCM/PADM 726	Introduction to Public Procurement	3
PPCM/PADM 728	Public Sector Contract Planning and Formation	3
PPCM/PADM 731	Public Sector Procurement Law and Ethics	3
Select one from the following:		3
PADM/PPCM 672	Public Financial Management	
PADM/PPCM 704	Methods of Public Program Evaluation	
PADM/PPCM 714	Public-Private Partnerships	

PADM/PPCM 719 Leadership

PADM/PPCM 727 Public Procurement and Project Management

PADM/PPCM 734 Negotiation and Dispute Resolution

PADM/PPCM 781 Intergovernmental Management

Total Hours 15

Maritime, Ports and Logistics Management Certificate

This certificate program is designed to help working maritime and port professionals develop and sharpen their maritime and port management skills. The program consists of four graduate courses that expose students to international shipping, port management, maritime law, port operations and planning and port economics.

Admission Requirements

Admission to the certificate program will require a bachelor's degree (or equivalent).

Program Requirements

The certificate is awarded based upon the student's successful completion of 12 credit hours of graduate level courses in Ports and Maritime Management:

PORT 611	International Maritime Transport	3
PORT 612	Port Operations and Management	3
PORT 613	International Maritime and Admiralty Law	3
PORT 614	Port Planning and Economics	3
Total Hours		12

Doctor of Philosophy in Business Administration (Ph.D.)

John Ford, Graduate Program Director

The Doctor of Philosophy degree in business administration (Ph.D.) is a scholarly, research-based program with a professional orientation. The objective of the program is to prepare individuals of superior promise and potential for careers in higher education as faculty members engaged in teaching and research and for high level administrative and research careers in the private and public sectors. Persons completing the degree program must have demonstrated an in-depth knowledge of international business, research methods, and high potential for making significant contributions to their field of specialization in business.

The Ph.D. degree requires competence in basic disciplines of international business, research tools, and in one of the following functional areas of business: finance, information technology, marketing, or strategic management.

Requirements for Admission

Work for the doctoral degree is usually preceded by the successful completion of the a Master's degree in a business related field (i.e., MBA) from a recognized AACSB-accredited college or university. The applicant must submit an application, official transcripts of all college or university-level work, provide scores on the Graduate Management Admission Test taken within the last five years, and provide three letters of recommendation, two from academic references, which attest to the individual's academic potential and ability for achievement. The applicant must also submit a personal statement of goals, approximately two to three pages, on how the completion of the doctoral program will assist in achieving personal and professional career goals.

The completed application materials will be reviewed by the graduate program director and faculty in the major area of study. They will evaluate the individual's abilities and motivation to succeed in the doctoral program. A personal interview may be required before the admission decision can be reached. A recommendation is made by the faculty and a final decision on admission is made by the graduate program director.

Requirements of the Ph.D. Degree

The following are the minimum requirements for the Ph.D. degree and must be considered in preparing the student's plan of study:

1. Satisfactory completion of at least 57 semester hours of course work including the dissertation for finance curriculum and at least 58 semester hours of course work including the dissertation for information technology, marketing or strategic management curriculums. (At least 48 hours of post-master's course work (including dissertation) is a University requirement);
2. Demonstrated competency in the following areas: international business, research methods and techniques, and the chosen functional field of business. Passage of a comprehensive examination covering international coursework is required.
3. Acceptable performance on a written and oral candidacy examination in the major field of study. A student may retake the candidacy examinations only one time;
4. Completion of a dissertation representing the candidate's ability to conduct scholarly, original research. The quality of this research should be such that it would be worthy of publication in a refereed, scholarly journal; and,
5. Successful oral defense of the dissertation.

Retention Standards

To remain in good standing after admission to the program, students must maintain a minimum, cumulative grade point average of 3.20 in all course work attempted at the University. Students who fall below this minimum standard will have one semester to remedy this deficiency. Further, students may earn no more than three credit hours with the grade of C. Any student receiving a grade lower than C- in course work will be removed from the program.

Time Limitation and Residency

The Ph.D. program assumes that a well qualified and highly motivated student can complete all degree requirements in four years of full-time work. If a student is unable to pursue the degree on a full-time basis, or if the major field is different from previous academic training, more time to complete the degree is usually required. The maximum time allowed to complete all degree requirements is eight calendar years from the date of initial enrollment in the program.

Each student is required to complete at least four regular semesters in full-time residency. These need not be consecutive. Full-time residency is defined as a minimum of nine credit hours per semester.

Transfer Credit

A maximum of 12 semester-hour credits (or equivalent) may be transferred from another university (including six hours earned through experiential learning credit options) and applied toward the Ph.D. course requirements. Transfer credit is approved at the discretion of the program director in consultation with the faculty in the student's major field of study.

Waivers Using Previous Graduate Work

A maximum of nine semester hours of master's-level graduate work may be applied toward completion of the requirements for the doctoral degree. The previous course work must have been of B letter-grade quality or better, and must have been completed within the five years immediately preceding entry into the doctoral program.

Candidacy Examination

The examination qualifying the doctoral student for candidacy for the Ph.D. in business administration is comprehensive in nature and designed to test the student's knowledge of subject matter in the major field, international business, and the ability to engage in independent research. These examinations are given in two parts:

1. international business and
2. field of study.

The International Business Exam is a written exam scheduled for the third week of May and may be taken by a student in good standing after the student has completed BUSN 800, FIN 862, MGMT 821, and MKTG 826. The candidacy examination in the field of study is scheduled at the beginning of fall semester classes. Students in good standing may take the Field of Study Examination after completing all courses in their field which are to be taken during the first two years of the program. See Curriculum. The Field examination contains both a written and oral component. The written portion is administered first. After successful completion of the written examination, the student sits for an oral examination, which includes topics discussed in the written examination and any additional materials that the advisory committee feels are appropriate. The student will be expected to perform well on both the written and oral components of the examination. Rather than being merely pro forma, the oral examination is a serious and integral part of the qualifying procedure for candidacy. A student must pass both the written and oral sections. The candidacy examinations are prepared and evaluated by the examination committees composed of the graduate faculty who are primarily responsible for teaching doctoral courses in international business and the field of study. The results of all examinations are reported to the student and program director.

Dissertation

The dissertation represents the final stage in obtaining the doctoral degree and provides evidence of the student's ability to conduct independent scholarly research. To effectively initiate, conduct, and conclude the dissertation phase of the program, the candidate must:

1. form a dissertation committee;
2. develop and defend a dissertation proposal;
3. complete the dissertation research and report the results in writing; and
4. orally defend the dissertation.

Dissertation Committee

The dissertation committee is formed by the student with the approval of the program director. The committee's purpose is to supervise the selection of the dissertation topic, constructively critique the research methodology, and serve as a guidance body until its completion. The committee should have at least three members, one of whom is from outside the department of the major field of study. The chair of the committee will be from the candidate's major field and be an authority in the field of specialization chosen for the dissertation research. The proposal, dissertation, and the final oral defense of the dissertation must have the majority approval of the members of the dissertation committee and subsequent approval by the program director and dean of the college.

Dissertation Proposal Defense

A candidate will select a topic for dissertation research under the guidance of his/her committee. The candidate will defend a proposal for the dissertation demonstrating the originality of the research, requisite literature review, and the methodology that will be used in conducting the research. The committee will judge the merits of the proposal, making any suggestions and/or additions as deemed necessary, and approve the proposal in writing, providing copies to the program director.

Dissertation Research and Preparation

Progress on the dissertation should be reported on a periodic basis to the chair of the dissertation committee and the appropriate members. In most instances, research results, drafts of the manuscript, and guidance will be forthcoming between the committee and the candidate during the research phase. While preparing the dissertation, candidates must be continuously enrolled for a minimum of one credit hour per semester. The total number of credit hours for the dissertation shall be no less than 18 and no more than 24 credit hours. Advice or assistance from committee members should not be expected unless the candidate is officially enrolled. General regulations and procedures governing the submission of the doctoral dissertation are provided in the University Guide for Preparation of Theses and Dissertations available from the Office of the University Registrar.

Oral Dissertation Defense

The objective of the oral defense of the dissertation is to explore with the candidate the methodological and substantive contributions of the dissertation. Through this process, the examiners and the candidate reach a common understanding of the research area and can mutually agree upon its merits for publication. Majority approval by the examiners constitutes successful completion of the defense of the dissertation. The Doctor of Philosophy in business administration will be awarded upon successful completion of this examination and all other program requirements within the eight-year time limit.

Finance Curriculum

First Year

First Term	Hours	Second Term	Hours
BUSN 800	3	ECON 807	3
ECON 801	3	FIN 864*	3
ECON 806	3	MKTG 826	3
	9		9

Second Year

First Term	Hours	Second Term	Hours
ECON 808	3	FIN 861	3
FIN 860	3	FIN 863	3
FIN 862	3	MGMT 821	3
	9		9

Third Year

First Term	Hours	Second Term	Hours
FIN 899	9	ECON 852	3
		FIN 899	9
	9		12

Total credit hours: 57

* Advanced doctoral level statistical/research methods course (3 hours) can substitute for FIN 864.

Information Technology Curriculum

First Year

First Term	Hours	Second Term	Hours
BNAL 700	1	BNAL 712	3
BNAL 711	3	IT 850	3
BUSN 800	3	MKTG 826	3
IT 800	3		
	10		9

Second Year

First Term	Hours	Second Term	Hours
FIN 862	3	IT 892	3
IT 890	3	IT 893	3
IT 891	3	MGMT 821	3
	9		9

Third Year

First Term	Hours	Second Term	Hours
IT 895*	3	IT 899	9

IT 899	9		
	12		9

Total credit hours: 58

* Or other (3 HRS) research methodology courses at the approval of PhD Area Coordinator.

Marketing Curriculum

First Year

First Term	Hours	Second Term	Hours
BNAL 700	1	BNAL 712	3
BNAL 711	3	MKTG 802	3
BUSN 800	3	MKTG 826	3
MKTG 801	3		
	10		9

Second Year

First Term	Hours	Second Term	Hours
MKTG 803	3	MKTG 814	3
MKTG 813	3	MGMT 821	3
FIN 862	3	MKTG 827	3
	9		9

Third Year

First Term	Hours	Second Term	Hours
MKTG 895*	3	MKTG 899	9
MKTG 899	9		
	12		9

Total credit hours: 58

* Advanced doctoral level statistical/research methods course (3 hours) can substitute for MKTG 895.

Strategic Management Curriculum

First Year

First Term	Hours	Second Term	Hours
BNAL 700	1	BNAL 712	3
BNAL 711	3	MGMT 835	3
BUSN 800*	3	MGMT 896	1
MGMT 840	3	MKTG 826*	3
	10		10

Second Year

First Term	Hours	Second Term	Hours
ECON 895	1	BNAL 796	1
FIN 862*	3	MGMT 821*	3
MGMT 842	3	MGMT 845	3
MGMT 838	3	MKTG 814	3
	10		10

Third Year

First Term	Hours	Second Term	Hours
MGMT 899	9	MGMT 899	9
	9		9

Total credit hours: 58

* Information Technology, Finance, Management, and Marketing track students take this course.

International Business Comprehensive Examination to be taken in May after the completion of coursework in the second year of the program.

Field Comprehensive Examination to be taken in August after the completion of coursework in the second year of the program.

Master of Business Administration

Kiran Karande, Graduate Program Director
Shanna Wood, Associate Director

The Master of Business Administration (M.B.A.) program at Old Dominion University is designed to present broad but thorough insights into issues relevant for effective business management. The Old Dominion University M.B.A. is structured to provide students flexibility in both delivery and time to completion. Students gain the skills necessary to become effective business professionals in an ever changing and increasingly global environment.

The program requires a minimum of 40 credit hours to earn a general M.B.A. degree. Students can choose from flexible completion schedules. The program may be completed as a full-time or part-time student in as little as 21 months and is distance friendly. Students may choose to pursue the general M.B.A. (40 credit hours) or may elect to pursue a dual credential such as a graduate certificate in addition to the core (48-51 credit hours depending on certificate) or a complementing graduate degree (66 + credits depending on degree selected).

The program is designed for both business and non-business undergraduates. Non-business undergraduates will be required to take and pass a set of five, one credit hour pre-core courses before moving on to the M.B.A. core courses. These courses will prepare students for the rigor involved in the core coursework. No other pre-requisites are required for non-business majors.

Students will have the option to complete the degree face-to-face at the main campus in Norfolk, online, or a combination of both. The program is accredited by AACSB – International.

Admission

Prospective students may apply for entrance into the program for the fall and spring semesters. The Strome College of Business welcomes applicants who have earned bachelor's degrees from regionally accredited institutions. Admission to the program is competitive and is granted only to those who show high ability and likely success in graduate business study. Evidence of ability means that successful applicants will stand well above average in most criteria used to measure graduate promise.

Criteria used for admission include the candidate's score on the Graduate Management Admission Test (GMAT) or Graduate Record Examination (GRE) for students pursuing dual degrees, undergraduate grade averages and the trend of the grades during undergraduate work, letters of reference, a goals statement, and work experience.

The application procedure is as follows: submit to the Graduate Admissions Office

1. application forms for graduate study in business,
2. official transcripts of all previous college work,
3. one letter of recommendation,
4. an essay on personal and professional goals,
5. resume; and

6. scores on the GMAT or GRE.

Applicants whose native language is not English are also required to submit an acceptable score on the Test of English as a Foreign Language (TOEFL) or International English Language Testing System (IELTS) .

Application deadlines for U.S. citizens and permanent residents are June 1 for fall admission and November 1 for spring admission. International student deadlines are April 1 (fall semester) and October 1 (spring semester).

Program of Study

Pre-Core (Required Non-Business Majors)

MBA 600	Introduction to Statistics	1
MBA 601	Introduction to Managerial Economics	1
MBA 602	Introduction to Finance	1
MBA 603	Introduction to Accounting	1
MBA 604	Introduction to Information Management	1

Core

MGMT 605	Essentials of Leadership	2
BNAL 606	Statistics for Managers	2
ECON 607	Managerial Economics	2
MKTG 608	Fundamentals of Contemporary Marketing	2
ACCT 609	Managerial Accounting	2
BNAL 610	Fundamentals of Business Analytics	2
ACCT 611	Financial Accounting	2
MGMT 612	Organizational Behavior	2
FIN 613	Financial Management	2
IT 614	Information and Knowledge Management	2
OPMT 615	Operations & Supply Chain Management	2
FIN 616	Investments and Portfolio Management	2
MKTG 617	Marketing Strategy	2
ECON 618	Global Macroeconomics	2
FIN 619	Business Law and Ethics	2

Electives

General Electives		4
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Capstone

INBU 620	International Business Issues	2
MGMT 621	Business Policy and Strategy	4

Total Hours		40
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MBA Electives

Each student must select a minimum of 4 credit hours of electives from the wide range of electives offered in each of the functional areas in the Strome College of Business: accounting, business analytics, economics, finance, information technology, management, marketing, operations management, and public administration as well as the one-hour MBA modules. Students have the flexibility to choose among the electives those that provide them with the educational background they desire.

Alternatively, students may choose to enhance their learning experience by adding a certificate from those offered. Certificates are offered in a wide variety of business and public administration areas at Old Dominion University. Generally they are 12 credit hours in length but can be more depending on subject area.

Students may apply a maximum of 6 credits earned through any combination of Experiential Learning, Internship, or Independent Study (only 3 credits are allowed in any one) as elective credits and the maximum number of credits students can earn through a combination of transfer and experiential learning is 12.

Continuance Policy

To remain in good standing after admission to the program, students must maintain a minimum, cumulative grade point average of 3.0 in all graduate

course work attempted at the University. Students who fall below this minimum standard will have one semester to remedy this deficiency.

Further, students may earn no more than 2 courses with the grade of C. Any student receiving a failing grade (F) in course work will be removed from the program.

Department of Accounting

2157 Constant Hall
(757) 683-3529

Douglas Ziegenfuss, Chair

Master of Science-Accounting

Yin Xu, Graduate Program Director

Accounting services are becoming both broader and more specialized. The major changes that have occurred in the accounting profession dictate expanded and updated educational programs. The minimum education necessary for the professional accountant cannot be achieved in four years of undergraduate study. For instance, the Virginia Board of Accountancy requires Certified Public Accountant (CPA) exam candidates to have 150 semester hours of education for licensure. Therefore, the ideal model for a professional accounting education embodies a Master of Science in Accounting program that augments a broad undergraduate education. The program is designed to accommodate both full-time and part-time students with courses offered in the evenings.

Admission Requirements

Prospective students may apply for admission to the program for the fall, spring, and summer semesters. The Department of Accounting welcomes applicants who have earned bachelor's degrees from accredited institutions. Admission to the program is competitive and is granted only to those who show high ability and likely success in graduate business study. Successful applicants will stand well above the average in most of the criteria used to measure graduate student promise.

Criteria used for admission include the candidate's score on the Graduate Management Admission Test (GMAT), undergraduate grade point averages and the trend in grades during undergraduate work, one letter of reference, a goals statement, and previous work experience. Students must earn a grade of B- or better in each undergraduate business course used to satisfy the program's prerequisite courses.

The application process is as follows: submit to the Graduate Admissions Office

1. application forms (may be done on-line) for graduate study in business,
2. official transcripts of all previous college work,
3. one letter of recommendation,
4. an one-page essay setting forth the applicant's work experience, and goals and objectives for the program, and
5. scores on the Graduate Management Admission Test (GMAT).

Applicants whose native language is not English are also required to submit an acceptable score on the Test of English as a Foreign Language (TOEFL) Exam.

Prior to admission, each candidate must have completed:

Six Hours of Financial Accounting

ACCT 201	Principles of Financial Accounting	6
& ACCT 301	and Intermediate Accounting I *	

Six hours of Management Accounting

ACCT 202	Principles of Managerial Accounting	6
& ACCT 311	and Managerial Accounting *	

Three hours of Taxation Courses

ACCT 421	Taxation *	3
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And eighteen hours in economics, statistics/decision sciences, marketing, management, finance, and commercial law.	18
Total Hours	33

* Or equivalent.

Application deadlines are July 1 for fall admission, November 1 for spring admission, and April 1 for summer admission. International student deadlines are April 15 (fall semester), October 1 (spring semester), and February 15 (summer semester).

Applicants who have not obtained an acceptable GMAT score, or an acceptable TOEFL score for those applicants whose native language is not English, will not be permitted to enroll in graduate accounting courses.

Fast-Track Undergraduate Admission

Undergraduate students majoring in Accounting at Old Dominion University may apply for conditional status in the Master of Science in Accounting program after completing ACCT 301, Intermediate Accounting I, with a minimum Overall and Accounting Grade Point Average of 3.00. These students can then achieve regular admission status by completing their undergraduate degree with a minimum Overall and Accounting Grade Point Average of 3.00, and obtaining an acceptable GMAT score.

Degree Requirements

A minimum of 30 semester hours of graduate courses are required to complete the Master of Science in Accounting. Students must maintain a cumulative grade point average of at least 3.00 in all graduate work taken. Additionally, students must successfully complete at least one part of one of the following professional exams during the final two semesters of their graduate course work:

- Certified Public Accountant (CPA) exam,
- Certified Management Accountant (CMA) exam, or
- Certified Internal Auditor (CIA) exam.

Students who already hold one or more of these professional designations must successfully complete at least one part of one of the other professional exams during the final two semesters of the graduate work.

The Program of Study

The program of study is designed for the student interested in a professional career in accounting either as an assurance services provider (auditor) or management accountant in public accounting or in industry and government. The curriculum, especially the required courses, are designed to improve the student's chances of passing the Certified Public Accountant (CPA) exam. However, there is enough flexibility in the choice of electives to tailor programs of study to successfully complete other certification exams such as:

- Certified Internal Auditor (CIA),
- Certified Management Accounting (CMA),
- Certified Information Systems Auditor (CISA),
- and the Certified Fraud Examiner (CFE) exams.

Additionally, a student completing the four auditing courses meets the requirements of the Institute of Internal Auditors Endorsed Internal Auditing Program.

Required Courses—Accounting Credits

ACCT 626	Financial and Global Accounting	3
ACCT 630	Financial Statement Analysis	3
ACCT 631	Advanced Financial Auditing	3
ACCT 640	Professional Ethics and Legal Issues In Accounting	3
TAX 650	Tax Strategies for Business Decisions	3
ACCT 727	Strategic Cost Management	3
Graduate accounting courses *		6

Graduate business or public administration elective courses at the 600 level	6
Total Hours	30

* Excluding ACCT 601.

Department of Economics

2044 Constant Hall
(757) 683-3567

Christopher B. Colburn, Chair

Master of Arts—Economics

David D. Selover, Graduate Program Director

The Master of Arts in economics is a flexible degree that can meet a wide range of student needs. The program allows students to pursue a traditional approach as preparation for entry into a doctoral program or an applied approach geared toward policy analysis in a specialized area.

Some graduates of the M.A. in economics have chosen to continue their graduate training and have successfully completed Ph.D. programs at universities across the nation. Other graduates have become economics teachers, primarily at the community-college level. Others have gone to research and analysis positions in governmental agencies and private business firms. Finally, still others have chosen to pursue careers in general business management.

All students in the program are trained in theory and research methods, and take several courses emphasizing business or government policy analysis in chosen specialty areas. An independent research project is required, permitting students to apply theory and empirical techniques to real-world problems.

The Department of Economics also encourages interdisciplinary training. The master's program can be adapted for students desiring a diverse background by combining economics with graduate courses in sociology, political science, computer science, statistics, mathematics, finance, management, marketing research, or public administration.

Admission

In addition to the University's graduate admission requirements, applicants seeking regular admission must have at least a 3.00 grade point average in their major. In addition, applicants are required to take either the Graduate Record Examination or Graduate Management Admission Test, and they must submit at least one letter of recommendation. If the undergraduate grade point average falls below that required for regular status, applicants may qualify for provisional admission.

Requirements

Undergraduate prerequisites include principles of economics, calculus (three hours), statistics (six hours), intermediate microeconomics, and intermediate macroeconomics with grades of at least B-.

Thirty semester hours of approved graduate work are required for the award of the Master of Arts degree in economics. A maximum of six hours of 500-level courses approved for graduate credit may be applied toward the degree. The remaining 24 hours of credit must be taken from 600- and/or 700-level courses. Up to six hours of electives (approved by the graduate program director) may be taken from courses outside the Department of Economics. Required core economics courses for the graduate program are:

ECON 625	Mathematical Economics	3
ECON 701	Advanced Economic Analysis: Microeconomics	3
ECON 703	Advanced Economic Analysis: Macroeconomics	3
ECON 706	Econometrics I	3
Total Hours		12

Writing skills commensurate with the level of this degree are also a requirement for graduation from this program.

Near the completion of formal course work, candidates conduct independent research projects with thesis or non-thesis options. Students who choose the thesis option should register for ECON 699 in the final semester. Six hours of credit are given for this course. The thesis is guided and approved by the committee of at least three members of the department. Detailed instructions, requirements, and deadlines are contained in the guide for Preparation of Theses and Dissertations, available from the Office of Graduate Studies web site, <http://www.odu.edu/graduatestudies>.

Students who choose the non-thesis option register for ECON 697 and ECON 698 in the last semesters of course work. Non-thesis students conduct independent research projects under the guidance of a department faculty member. Students must first register for ECON 697, a reading course under the supervision of a faculty member, for three credits, and then register for ECON 698, the research project writing course, also under the supervision of a faculty member, for three credits. All master's candidates must pass written comprehensive examinations covering microeconomics, macroeconomics, econometrics I, and one elective course area selected by the student.

Required Courses – Economics

ECON 625	Mathematical Economics	3
ECON 701/801	Advanced Economic Analysis: Microeconomics	3
ECON 703/803	Advanced Economic Analysis: Macroeconomics	3
ECON 706/806	Econometrics I	3
ECON 697	Readings in Economics	3
ECON 698	Economic Methodology and Research	3
Select four Electives *		12
Total Hours		30

* These are generally 600- or 700-level courses from within the economics discipline. However, two of the courses may be approved 500-level courses, and two of the courses may be outside of the Department of Economics.

Department of Information Technology and Decision Sciences

2074 Constant Hall
(757) 683-3488

G. Steven Rhiel, Chair

Master of Science–Computer Science Major with an Emphasis in Computer Information Sciences

Li Xu, Graduate Program Director

The Department of Information Technology and Decision Sciences offers this degree program jointly with the Department of Computer Science; please see the entry under the Department of Computer Science (p. 207) for degree requirements.

Graduate Certificate in Modeling and Simulation (M&S) for Business and Public Administration

Business applications constitute some of the earliest used simulation modeling, with some dating back over 50 years, and the literature of many businesses and social science disciplines is rich with both practical and theoretical usage of simulation. Recent developments in simulation, such as agent-based simulation and virtual worlds, open even avenues for M&S

applicability. This certificate gives CBPA graduate students an opportunity to develop competency in Modeling and Simulation.

Admission Requirements:

Admission to the certificate program requires a bachelor's degree (or equivalent).

Program Requirements:

The Certificate requires four (4) three-hour courses for a total of twelve (12) credits. A basic simulation core of three credits is required, plus six credits of discipline-specific work, and three credit hours of elective. A 3.00 GPA for the four-course sequence is required for successful completion.

CBPA M&S Certificate

MSIM 601	Introduction to Modeling and Simulation	3
BNAL 721/821	Simulation Modeling for Business Systems	3
BNAL 722/822	Agent-Based Simulation and Modeling	3
Select one of the following: *		3
BNAL 507	Advanced Management Science	
BNAL 641	Supply Chain Management and Logistics	
BNAL 712	Advanced Statistical Models in Business Research	
ECON 625	Mathematical Economics	
ECON 706/806	Econometrics I	
ECON 707/807	Econometrics II	
ECON 708/808	Econometrics III	
IT 612	Knowledge Management	
IT 651	Data Warehousing and Mining	
IT 652	On-Line Analytical Processing (OLAP)	
FIN 735/835	Portfolio Analysis	
FIN 740	Futures and Options	
MSCM 641	Supply Chain Management and Logistics	
MKTG 625	Marketing Research Methods and Analysis	
OPMT 624	Cooperative Education	
Total Hours		12

* Other classes may count as an M&S elective with permission of the certificate administrator.

Department of Urban Studies and Public Administration

2090 Constant Hall
(757) 683-3961

John R. Lombard, Chair
Meg Jones, Graduate Program Manager

Master of Public Administration

David Chapman, Graduate Program Director
Meg Jones, Graduate Program Manager

The mission of the Master of Public Administration program at Old Dominion University is to prepare students for careers as professionals in public service and to provide students who have considerable experience in the public sector an opportunity to enhance their professional knowledge, skills, and abilities, enabling them to advance their careers.

Curriculum

The MPA curriculum consists of 39 credit hours (13 courses). Courses are required in two categories:

1. **Core Concentration** (seven required courses)
2. **Electives** (six courses)

Core Curriculum

The following courses are required of all public administration students.

PADM 651	Administrative Theory I: The Context of Public Administration	3
PADM 652	Administrative Theory II: The Process of Public Administration	3
PADM 671	Public Budgeting and Financial Management	3
PADM 701	Public Policy and Evaluation	3
PADM 733	Legal and Ethical Foundations of Public Administration	3
PADM 753	Research Methods in Public Administration	3
PADM 746	Capstone Seminar in Public Administration	3
Total Hours		21

Electives

Students may also choose to take their elective courses in the general area of Public Management. With the approval of the MPA Program Director students may take Graduate level courses outside of the Department.

MPA Elective courses include the following:

Select 6 of the following: 18

PADM 632	Environmental Planning
PADM 633	Methods of Urban Planning
PADM 634	Regional Planning
PADM 640	Urban and Regional Issues
PADM 655	Theories of Public Organization
PADM/PPCM 672	Public Financial Management
PADM 695	Advanced Topics *
PADM 702	Urban Resource Allocation
PADM/PPCM 704	Methods of Public Program Evaluation
PADM 705	Urban Law and Public Policy
PADM 708	Urban and Regional Economic Development
PADM 711	Urban Services Administration
PADM 712	Emergency Management and Policy
PADM/PPCM 714	Public-Private Partnerships
PADM 715	Management of Nonprofit Organizations
PADM 716	Introduction to Nonprofit Sector
PADM 717	Nonprofit Financial Management and Fund Raising
PADM/PPCM 719	Leadership
PADM 720	Public Personnel Administration
PADM 721	Transportation Policy
PADM 723	Ethics in Public Administration
PADM 724	Administration of Human Services
PADM 725	Business, Government, and Society
PADM/PPCM 727	Public Procurement and Project Management
PADM 730	Theoretical Conflict Resolution and Problem Solving
PADM/PPCM 734	Negotiation and Dispute Resolution
PADM 737	Digital Government
PADM 738	Conflict Mediation and Arbitration
PADM 745	Managing Development and Change in Organizations
PADM/PPCM 781	Intergovernmental Management
PADM 795	Advanced Topics in Public Personnel Administration
PPCM/PADM 718	Public Sector Contract Administration
PPCM/PADM 726	Introduction to Public Procurement
PPCM/PADM 728	Public Sector Contract Planning and Formation

PPCM/PADM 731 Public Sector Procurement Law and Ethics

Total Hours 18

* From time to time courses under the heading of PADM 695 "Advanced Topics" will be offered that students may choose to take as electives.

Recommended Course Sequence

Students are required to enroll in Administrative Theory I: The Context of Public Administration (PADM 651) and Administrative Theory II: The Process of Public Administration (PADM 652) as early as possible in their program of study. The remaining core courses are not required to be taken in a specific order however, the Capstone Seminar (PADM 746) must be taken after the other core courses have been completed (or in the same semester as the last of the core courses are being completed). Students should note that core courses are rarely offered during the summer term and should plan accordingly.

Internship/Field Experience

Practical professional experience in a public or nonprofit agency setting is an important component of the MPA curriculum. A formal internship is required for students who lack significant experience in a public or nonprofit agency. Internships give students the opportunity to gain professional level experience and provide government or nonprofit agencies with the services of graduate students with high potential for future achievement. MPA students have the opportunity to earn three semester credits for internships and apply these credits as one of their electives. PADM 668 Internship/Field Experience is a 300-hour public service experience in an approved agency. Please contact Dr. Chapman with specific questions you may have regarding internships, dchapman@odu.edu.

The Application Package

The Old Dominion University Graduate Application can be downloaded from the website, www.odu.edu, or a Graduate Application Package may be received by calling (757) 683-3685. This package includes all forms necessary to apply to the Master of Public Administration program. To be considered for admission, applicants must submit the following:

1. An official transcript of previous college degree program(s).
2. A written statement describing how one's experience in work and in other settings and the choice of graduate study in public administration will lead to achieving career goals;
3. Scores on the aptitude section of the Graduate Record Examination (GRE) or the Graduate Management Admission Test (GMAT), taken within the past six years. The requirement for the GRE or GMAT may be waived for applicants with at least three years supervisory, managerial or professional level experience in a local, regional, state, federal, military or nonprofit agency. Applicants who wish to be exempted from the GRE or GMAT requirement should complete the "Request for GRE/GMAT Waiver" form and submit it with their application package for review by the admissions committee. The decision to waive the GRE or GMAT is the sole responsibility of the admissions committee and its decision is final;
4. Two letters of recommendation (forms provided) from academic sources or employment supervisors; and
5. Applicants whose native language is not English are required to submit an acceptable score on the Test of English as a Foreign Language (TOEFL).

Financial Assistance

Financial aid is available to graduate students at Old Dominion University. Financial aid may be available in the form of University fellowships, tuition grants, and research assistantships. The M.P.A. program offers graduate research assistantships each semester. In addition to the financial aid offered by the University, graduate students may be eligible for aid and student loans administered by other agencies. For information about part-time employment, scholarships, and student loans, contact the Office of Student Financial Aid.

For information and forms concerning application, contact:

Admissions Office
Old Dominion University
Norfolk, VA 23529
Phone: (757) 683-3685

For information concerning financial aid, contact:

Office of Student Financial Aid
Old Dominion University
Norfolk, VA 23529
Phone: (757) 683-3683

For information about on-campus housing, contact:

The Director of Housing Operations
Old Dominion University
Norfolk, VA 23529
Phone: (757) 683-4283

Visit the Old Dominion University web site at: <http://www.odu.edu>.

Doctor of Philosophy - Public Administration and Urban Policy

John R. Lombard, Graduate Program Director
Meg Jones, Graduate Program Manager

The principal objective of the Ph.D. in Public Administration and Urban Policy is to assure that graduates become content area experts with 48 hours of doctoral level course work and 12 hours of dissertation credit. Specifically, students will learn a common body of knowledge in three areas:

Foundation in Public and Urban Policy (core courses)	12
One of either of two tracks with courses specific to public administration or public policy (concentration courses)	12
Foundation in research (quantitative and qualitative research courses)	12
Unique Cognate Courses *	9
Dissertation Seminar	3
Total Hours	48

* Selected by the student with advice and consent of the student's advisory committee and the Graduate Program Director.

Through this approach, all program graduates will have the opportunity to develop a substantive knowledge of a body of work in public administration and public policy as well to acquire analytical and research skills that will enable them to become educators, leaders and researchers in their chosen specialty areas. The Ph.D. program in Public Administration and Urban Policy, therefore, will focus on:

1. developing effective public, non-profit sector and policy leaders throughout Hampton Roads. The Commonwealth of Virginia, and the nation who have both content knowledge and research skills;
2. educating individuals who intend to pursue teaching as a vocation in colleges and universities in Virginia as well as nationally and internationally;
3. building collaborative research and demonstration initiatives with community and government (state, national, and international) agencies that link research initiatives to public management and policy improvement and economic development; and
4. providing the linkages among content knowledge, research, and field experiences for all doctoral students.

Admission

Applications for admission to the program will be considered once per year in April (see the website for specific details). Students generally begin classes in the fall, but admitted students may enroll in the summer after they are admitted.

Candidates for admission to the doctoral program must have a master's degree in an appropriate discipline in a program that is accredited by an

appropriate specialized accrediting agency and from an institution of higher education that is regionally and/or nationally accredited. A minimum grade point average of 3.25 (on a 4.0 scale) overall and in the major area of study in the master's degree and an acceptable score on the Graduate Record Examination (GRE) is required; a minimum score of 500 on the verbal section is required. Applicants whose native language is not English must score a minimum of 550 on the Test of English as a Foreign Language. Upon admission, the student must contact the Ph.D. Program Director in the Department of Urban Studies and Public Administration for advisement.

A student seeking admission to the doctoral program should request an application from the Office of Graduate Admissions of Old Dominion University. The application should be filled out completely and promptly returned to the Office of Graduate Admissions.

Each application must contain the following materials:

1. Three letters of recommendation, including at least one from an academic source;
2. A three to six-page double-spaced written statement of academic and professional goals.
3. Official copies of transcripts from all institutions of higher education attended and
4. Aptitude scores on the Graduate Record Examination (GRE) taken within five years prior to application for admission must be sent directly to the Office of Admissions.

Time Limitation and Retention Standards

The Ph.D. program assumes that well-qualified and highly motivated student can complete all degree requirements in four years of full-time work. If a student is unable to pursue the degree on a full-time basis, or if the major field is different from previous academic training, more time to complete the degree is usually required. The maximum time allowed to complete all degree requirements is eight calendar years from the date of initial enrollment in the program.

To remain in good standing after admission to the program, students must maintain a minimum grade point average of 3.25 in all course work attempted in the Plan of Study. Students who fall below this minimum standard will have one semester to remedy this deficiency. Further, students may learn no more than three hours with a grade of C+ or lower. Any student receiving a grade of F in any course work will be immediately removed from the program.

Financial Aid

Old Dominion University offers financial assistance to graduate students. Types of aid include research assistantships, teaching assistantships, fellowships, grants, scholarships, and part-time employment. Nearly all forms of aid require that the student be engaged in full-time graduate study, and in the case of assistantships, students are required additionally to work 20 hours per week with an assigned faculty member.

Students may receive an assistantship or fellowship. Amounts for assistantships are typically \$6,000 to \$12,000 and fellowships from \$7,500 to \$15,000 per academic year. College funds affect fellowship and assistantship amounts, as well as the continuation of funding. Tuition is waived for research assistants. All assistants and fellowships recipients are evaluated each semester; satisfactory progress toward the degree and acceptable work output are required for the continuation of funding. Funding students must be full-time students, and full-time or part-time work outside of the assistantship or fellowship is not allowed without the express written permission of the Graduate Program Director.

In addition to financial aid offered by the University, graduate students may be eligible for aid administered by other agencies. For information about part-time employment, scholarships, and student loans, contact:

Office of Student Financial Aid
Old Dominion University
Norfolk, VA 23529-0052
(757) 683-3683

Program Policies

The Department of Urban Studies and Public Administration maintains an official Ph. D. Program Handbook that contains information about degree requirements, advising, comprehensive examinations, dissertation planning and execution, and many other program policies. Please refer to the department's website for a downloadable copy of the program handbook.

Prerequisites

Applicants who have insufficient background in any of the prerequisite competency areas (PADM 651 Administrative Theory I: The Context of Public Administration, FOUN 722 Quantitative Research Design or (or any course so designated by the GPD) will be required to enroll in courses in the area(s) of deficiency. Such courses must be completed with a grade of B or better. Depending on previous qualifications, students may be advised to take additional prerequisite courses as well. These prerequisite courses will not be included in the required credit hours to complete the doctoral program.

Course Offerings

Students are required to complete a minimum of 45 hours of course work and maintain a minimum grade point average of 3.25 or better. Up to 12 hours of appropriate course work beyond the master's degree and with a grade of B or better may be transferred into the program with the approval of the Ph.D. Program Director. In addition to course work, students are required to take three hours of dissertation seminar and a minimum of 12 hours of dissertation credit.

Core courses

PAUP 801	Theories of Public Policy	3
PAUP 808	Intellectual Foundations of Public Administration	3
PAUP 809	Public Organization Behavior and Theory	3
PAUP 810	Governance and Accountability	3

Research Core courses

PAUP 802	Logic of Social Inquiry	3
PAUP 803	Multivariate Quantative Analysis for Public Administration	3
PAUP 853	Research and Evaluation Design	3
FOUN 814	Qualitative Research Design in Education	3

Major Concentration (Select one of the following tracks)

Public Administration Track *

PAUP 813	Contemporary Public Administration Theory	
Select three from the following:		
PAUP 820	Public Personnel Administration	
PAUP 823	Ethics in Public Administration	
PAUP 830	Theories of Conflict Resolution and Problem Solving	
PAUP 845	Managing Development and Change in Public Organizations	
PAUP 895	Advanced Topics in Public Personnel Administration	
PAUP 898	Directed Research (may register for up to two, with consent of the student's Advisory Committee and the Graduate Program Director)	

Public Policy Track *

PAUP 812	Public Policy Formulation and Implementation	
Select three from the following:		
PAUP 804	Policy and Program Evaluation	
PAUP 811	Urban Services Administration	
PAUP 814	Public-Private Partnerships	
PAUP 881	Intergovernmental Relations	

PAUP 895	Advanced Topics in Public Personnel Administration	
PAUP 898	Directed Research (may register for up to two, with consent of the student's Advisory Committee and the Graduate Program Director)	
Minor (Cognate) **		12
Dissertation		12
PAUP 890	Dissertation Seminar	3
Total Hours		63

* Other courses may be considered for substitution for courses listed in each concentration track. In addition, students may take up to one course from the concentration area other than their chosen area, with the permission of the student's Advisory Committee and the Graduate Program Director.

** Students will take at least nine credit hours designated by their Advisory Committee, in consultation with the student's cognate Professor and the Graduate Program Director. Cognates may be formed of courses offered within USPA, or a combination of both. Students may include up to two Independent Study/Directed Research courses in their cognate area.

Certificate in Public Administration and Policy

Meg Jones, Graduate Program Manager

The Department of Urban Studies and Public Administration in the Strome College of Business at Old Dominion University offers an Advanced Certificate in Public Administration and Policy. The objective of the program is to help working professionals upgrade their skills in the areas of policy analysis and public management, by developing analytical and management capabilities.

All courses are taught in the evening.

Curriculum

The curriculum consists of five tracks of courses listed below. Students are required to take four courses, a total of 12 credit hours, to complete the certificate program. Each is to be seen as a subspecialty in the field of public administration and policy. WITH GUIDANCE FROM A FACULTY ADVISOR, THE STUDENT SELECTS A TRACK.*

Conflict Resolution and Negotiation

PADM 730	Theoretical Conflict Resolution and Problem Solving	3
PADM 734	Negotiation and Dispute Resolution	3
PADM 738	Conflict Mediation and Arbitration	3
PADM 745	Managing Development and Change in Organizations	3

Human Resource Management

PADM 651	Administrative Theory I: The Context of Public Administration	3
PADM 655	Theories of Public Organization	3
PADM 720	Public Personnel Administration	3
PADM 795	Advanced Topics in Public Personnel Administration	3

Public Policy

PADM 701	Public Policy and Evaluation	3
PADM 704	Methods of Public Program Evaluation	3
PADM 705	Urban Law and Public Policy	3
PADM 753	Research Methods in Public Administration	3

Public Budgeting and Finance

PADM 671	Public Budgeting and Financial Management	3
PADM 781	Intergovernmental Management	3

ECON 545	Urban Economics	3
ACCT 601	Accounting for Managers	3
General Public Sector Management		
PADM 651	Administrative Theory I: The Context of Public Administration	3
PADM 652	Administrative Theory II: The Process of Public Administration	3
PADM 655	Theories of Public Organization	3
PADM 733	Legal and Ethical Foundations of Public Administration	3

* Any alteration in course selection requires prior faculty advisor approval.

Business and Public Administration

Affiliates

The college has several external units which enhance and support the academic programs. These units, listed below, offer opportunities for faculty members and students to interact with representatives of business, industry and government in Eastern Virginia.

Center for Asian Business

The Center for Asian Business has been established to enhance the college's capacity to teach and conduct research on the subjects related to Asian business practices. The center collects and disseminates information on Asian businesses, supports course offerings on Asian management, and publishes research monographs and articles on the subject. Also, the center provides managerial training and consulting services for Asian companies and executives.

The Center for Economic Education

The center is an integral part of the national effort dedicated to improving economic literacy and promoting a greater understanding of the free enterprise system. A nonpartisan, nonprofit organization, the center is an affiliate of the Virginia Council on Economic Education and the National Council on Economic Education. The center works cooperatively with school systems promoting increased effectiveness of economics instruction in grades K-12 through workshops, credit classes, and consultations.

Executive Development Center

The center's mission is to provide businesses, organizations, and individuals with high quality professional development and continuing education programs in virtually all areas of business, management, and executive education. The center offers public programs for individuals seeking professional certificate programs, preparation for certification exams, career advancement, and career change. In addition, the center develops and delivers custom training programs and consulting services to meet specific organizational and employee development needs of businesses and organizations regionally, nationally and internationally.

Regional Studies Institute

The primary objectives of the institute are to conduct research and develop a knowledge base on regional issues in the Eastern Virginia area. In addition, it provides a forum for regional collaboration involving educational, business, and government organizations.

Insurance and Financial Services Center

The Insurance and Financial Services Center supports undergraduate and graduate curricula in the disciplines of professional financial planning and risk and insurance. In addition, it provides for active involvement with the Eastern Virginia financial services community as a placement, research, consultative, and resource agency. The center further supports educational programs and seminars for the profession including a professional development program for practitioners that leads to the designation of Professional Financial Planner (PFP).

Maritime Institute

The mission of the institute is to provide world quality maritime, ports and logistics management education, training, and research to meet regional, national and international needs. The Maritime Institute serves as a positive catalyst for the delivery of education, training, research, and service programs, thus supporting the economic growth and international competitiveness of greater Hampton Roads and Virginia. Courses are available at both the undergraduate and graduate levels. Professional and executive-level seminars, workshops, and short courses will also be offered.

E.V. Williams Center for Real Estate and Economic Development

The mission of the center is to provide information and resources for the Hampton Roads real estate and economic development communities in their quest to improve the regional economy through job creation and investment. The center fosters relationships with the development community by hosting topical seminars on key development issues affecting the region and works closely with all related professional service organizations. The center maintains a comprehensive collection of information including detailed demographic and real estate data and employs the latest in geographic information and mapping software. The center publishes annual real estate market reviews on the office, industrial, retail, single family and multi-family real estate markets, and sponsors the Hampton Roads Real Estate Market Review and Forecast.

Darden College of Education

www.education.odu.edu/

218 Education Building
757-683-3938 (office)
757-683-5083 (fax)

Jane S. Bray, Dean
Gail K. Dickinson, Associate Dean, Graduate Programs and Research
Robert J. Spina, Associate Dean, Undergraduate Programs and Assessment
Leigh Butler, Assistant Dean, Teacher Education Services and Advising

The Darden College of Education offers the Master of Science (M.S.), Master of Science in Education (M.S.Ed.), and Educational Specialist (Ed.S.) degrees as well as the Doctor of Philosophy (Ph.D.) degree in the following broad concentrations and areas. More complete information is found on the following department web pages:

Counseling

- Counseling Ph.D, Ed.S, M.S.Ed.

Communication Disorders and Special Education

- Special Education Ph.D., M.S.Ed.
 - Autism (certificate)
- Communication Sciences and Disorders M.S.Ed.

Educational Foundations and Leadership

- Educational Leadership Ph.D.
- Community College Leadership Ph.D.
- Educational Leadership Ed.S., M.S.Ed.
- Higher Education Concentration Ph.D, Ed.S., M.S.Ed.

Human Movement

- Exercise Science and Wellness M.S.Ed.
- Physical Education and Health Education Curriculum and Instruction M.S.Ed.
- Human Movement Science Ph.D.
 - Sport and Recreation Management Emphasis
 - Applied Kinesiology Emphasis
- Sport Management M.S.Ed.

Science, Technology, Engineering, and Mathematics, (STEM) Education and Professional Studies

- Instructional Design and Technology Ph.D. M.S.Ed.
- Occupational and Technical Studies Ph.D. Ed.S., M.S.
 - Business and Industry Training Concentration
 - Community College Teaching Concentration
 - Career and Technical Education Concentration

Teaching & Learning

- Early Childhood Education, Ph.D, M.S.Ed.
- Curriculum and Instruction, Ph.D.
- Literacy Leadership, Ph. D.
- Reading Education M.S. Ed.
- Elementary Education (Pre-K-6, Middle/School 6-8) IDS 5th Year, M.S.Ed.)
- Secondary Education (6-12 Initial licensure; English, mathematics, Earth science, chemistry, biology, physics, history/social studies)
- Library Science M.S. Ed.
- Teachers of English to Speakers of Other Languages (TESOL) M.S.Ed.
- Military Career Transition Program

Overview

The Darden College of Education is comprised of the following departments:

- Communication Disorders and Special Education;
- Counseling and Human Services;
- Educational Foundations and Leadership;
- Human Movement Sciences;
- Science, Technology, Engineering and Mathematics (STEM) Education and Professional Studies; and
- Teaching & Learning.

Mission

The Darden College of Education is committed to excellence in teaching, scholarly activities, and service. The college strives to meet the needs of the community while maintaining national and international prominence and is dedicated to preparing distinguished professionals who are leaders in their field. The college fulfills its mission through its undergraduate and graduate programs in the fields of education, counseling and human services, exercise science, athletic training, sport management, recreation, training, fashion, communication sciences and disorders, and instructional and industrial technology, as well as its continuing education activities.

Graduate Certificate in Military Children and Families

John A. Nunnery – Program Director

The Military Child and Families Certificate is an interdisciplinary program that will provide educators with specialized expertise in meeting the academic, social, and emotional needs of military connected P-12 students. Teachers, counselors and school leaders in this program will take 12 credit hours of course and field work that will actively engage them in: (a) building the foundational research-based knowledge and skills that are requisite for identifying, understanding and meeting the needs of military children and families, (b) collecting and analyzing school-wide, classroom and individual assessment data to identify and prioritize the specific support needs of their military connected students and families; and (c) applying their foundational and assessment knowledge and skills to design and implement research-based, flexible, adaptable and assessable programs that meet the identified needs in order to help ease transition, facilitate adjustment, and approve academic and social development outcomes for these students.

Requirements:

The students who pursue this certificate must complete 12 graduate credit hours. This includes:

COUN 689	Understanding Military Connected Children and Families *	4
ELS 623	Design of Service Delivery Plans to Meet the Needs of Military Connected Children and Families *	4
FOUN 662	Assessment and Evaluation for Schools Serving Military Connected Children and Families *	4
Total Hours		12

* Includes a service learning component that accounts for approximately 25% of students' time and effort in the certificate program.

Department of Communication Disorders and Special Education

Anastasia Raymer, Chair
Child Study Center
757 683-4117

The Department of Communication Disorders and Special Education is housed in the Lions Child Study Center (4501 Hampton Blvd.), a building that was made possible through the generosity of civic clubs, alumni, patrons and students and which opened in 1997. The clinical programs, housed in the center, give students valuable practical experience, deliver needed professional and educational services to members of the Hampton Roads community, and provide a laboratory setting for innovative faculty and student research. The department's strategic objective is to prepare future clinicians, educators, leaders, researchers, and policy makers to be a resource for state and national initiatives, and to serve as an exemplary center for educational research and practice. The faculty is dedicated to preparing professionals to serve as recognized leaders in the fields of education, clinical settings and agencies. PhD program is offered in special education, and master's degree programs are offered in special education, and communication sciences and disorders. Post-baccalaureate endorsement programs are offered in special education.

Due to changing University requirements, national accreditation standards, and Commonwealth licensure regulations, the programs in the Darden College of Education are under constant revision. Any changes resulting from these factors supersede the program requirements described in the catalog. Students should obtain current program information from their advisors and the Darden College of Education website at <http://www.odu.edu/education>.

Individual programs are described on the following pages in this order:

Special Education

- Master of Science in Education with Research Emphasis
- Master of Science in Education with Special Education: General Curriculum, K-12 Licensure
- Master of Science in Education with Special Education: Adapted Curriculum, K-12 Licensure
- Master of Science in Education with Early Childhood Special Education Licensure
- Post Baccalaureate Endorsement Program with Special Education: General Curriculum, K-12 Licensure
- Post Baccalaureate Endorsement Program with Special Education: Adapted Curriculum, K-12 Licensure
- Post Baccalaureate Endorsement Program with Early Childhood Special Education
- Post Baccalaureate Endorsement Program with Visual Impairments, K-12 Licensure
- Autism Certificate Program
- Applied Behavior Analysis Certificate Program
- Doctor of Philosophy in Education with a concentration in Special Education

Communication Sciences and Disorders

- Master of Science in Education

Master of Science in Education–Special Education

Sabra Gear, Graduate Program Director

Child Study Center, (757) 683-4383

Within the Master of Science in Education Special Education degree program, there are two programs: one for licensed teachers who seek an advanced degree with a research emphasis and the other for those who seek initial licensure in special education and a master's degree. The special education graduate program is committed to a philosophy of serving as a catalyst to promote awareness, understanding, and acceptance of individuals with disabilities. The course work focuses on the improvement of the quality and scope of educational and related services available to individuals with disabilities from infancy to adulthood.

Note to students in Washington State from the Student Achievement Council (SAC) concerning the Master of Science in Education -Master of Science in

Education (Special Education): Eligibility for initial educator certification in Washington is based on completion of a state approved educator preparation program. This program is approved in Virginia and is authorized for field placements in Washington by the Professional Educators Standards Board. Even though you may be residing in Washington while in this program, your application for educator certification in Washington will be processed as an out-of-state application. Go to <http://pathway.pesb.wa.gov/outofstate> for more information. Teachers are advised to contact their individual school districts as to whether or not this program may qualify for teacher advancement.

Special Education, Research Emphasis

Old Dominion University's Master's Degree in Special Education with Research Emphasis is designed to provide fully licensed special educators with an advanced professional degree and competencies beyond endorsement. This online master's degree will include a focus on scholarly research, advanced instructional strategies, and the foundations of special education leadership. The ODU Master's Degree in Special Education with Research Emphasis features:

- Interactive instructional technology
- Select cohort of students
- Participation in an online community
- Professional development using Council for Exceptional Children Advanced Program and National Board for Professional Teaching (NBPTS) standards
- Synchronous and asynchronous components
- Experiences congruent with National Board Professional Teaching Standards (NBPTS) certification requirements

The ODU Master's Degree in Special Education with Research Emphasis program is delivered in a cohort model with a new cohort of students entering the program each spring. As a cohort program, the availability and sequence of courses is predetermined and restricted to the cohort. This program also utilizes a field-based model for practicum experiences. As such, student classrooms will be used for all practica experiences in the program. The research emphasis also will serve as the prerequisite course work to the PhD concentration in special education, thereby facilitating entry into the PhD program for master educators seeking terminal degrees.

Admissions

Admission to the graduate program in special education is granted by the department's graduate program director in conjunction with special education faculty. The following requirements are necessary for admission to the program.*

Applicants must:

1. hold a baccalaureate degree from a regionally accredited institution or an equivalent degree from a foreign institution;
2. hold a renewable, current, and valid teaching license with endorsement(s) in special education;
3. be currently teaching preK- 12 students with disabilities;
4. have a minimum of two years teaching experience teaching preK- 12 students with disabilities;
5. have an undergraduate grade point average of 3.0 or better;
6. take and receive satisfactory scores on either the Graduate Record Examination (GRE) (i.e., a score of 291 combined on Verbal and Quantitative with a minimum Verbal Reasoning score of 150 for regular admission and 4.5 on the Analytical Writing section) or Miller Analogies Test (MAT) (i.e., score of 403 for regular admission);
7. provide three letters of recommendation, including at least two professional recommendations; and
8. submit a brief essay that highlights the student's research/professional development interests. Discussion of research/professional development interest areas should include empirical support for proposed lines of inquiry.

***Note:** Admission and prerequisite requirements: admission to the graduate program in special education is granted by the department's graduate program director in conjunction with special education faculty. Under certain circumstances, applicants who do not fully meet the requirements for regular admission to the program may be admitted on a provisional basis subject to conditions specified by the graduate program director.

Additional requirements:

- **Technology:** Participation in this online program requires reliable access to and facility with updated technology. Applicants must have consistent access to high speed Internet and computer equipment capable of high levels of connectivity such as two-way video/audio conferencing. Admitted students must plan to buy the headphones, microphones (or headset) and webcam for synchronous communication during and outside class. While wireless connections generally work, we recommend the use of a computer connected via cable to the modem/router. Dial up access is not sufficient.
- **Basic Skills and Dispositions:** Additional required competencies: Students admitted to the special education program are expected to be able to complete the essential abilities outlined in the CDSE Technical Standards document (pdf) (<http://education.odu.edu/esse/academics/sped/grad/TECHNICAL%20STANDARD1%20MSED%20SPED%20final%20revision%20102.pdf>) and to exhibit the dispositions noted in the ODU Teacher Dispositions statement (pdf). (<http://education.odu.edu/esse/academics/sped/grad/Teacher%20Candidate%20Dispositions%20at%20Old%20Dominion%20University.pdf>)
- **Additional Software:** All individuals seeking admission into any Teacher Education Program at Old Dominion University, upon enrolling/registering for their first education class, are required to purchase LiveText, a web-based portfolio assessment system approved by the ODU Teacher Education Council. LiveText must be purchased either from the ODU bookstore or <http://www.livetext.com/>. More information on LiveText: <http://education.odu.edu/livetext/>. Additional software may be necessary.
- **Classroom Requirements:** Students will be expected to complete practica, including the filming of classroom practices, in their classrooms. As such, applicants must be currently assigned to teach students with disabilities and must be able to gain permission to record their students (for educational purposes only).
- **Class Attendance:** The program of study consists of asynchronous and synchronous instruction. Students admitted to the program are expected to attend all synchronous class sessions using communication software (e.g., Adobe Connect).

Continuance

Students must:

1. complete the CITI Responsible Conduct of Research training modules. See <http://www.odu.edu/research/responsible-conduct-of-training>.
2. maintain a grade point average of 3.00 overall and receive a B or better in all practicum courses;
3. participate in a continuance review; and
4. successfully complete all competencies relative to their program of study.

Exit

Students must:

1. have a grade point average of 3.00 overall and a grade of B- or better in all course work;
2. satisfactorily complete all program requirements including the written comprehensive exam (see written comprehensive exam application and checklist (<http://education.odu.edu/esse/academics/sped/grad/written.shtml>));
3. complete a Graduate Student Assessment (<http://www.odu.edu/academics/graduation-commencement/exit>); and
4. submit a professional research project according to program guidelines prior to the awarding of the master's degree in special education.

Curriculum

Foundation and Perspectives

CDSE 695	Topics in Education	1-3
SPED 701/801	Historical and Contemporary Research in Special Education	3
SPED 720/820	Curriculum and Instruction: Research Into Practice	3

Advanced Intervention Strategies

SPED 621	Effective Interventions for Children and Youth with Challenging Behavior	3
SPED 702/802	Cognitive Processes and Learning Strategies for Students with Special Needs	3
SPED 705	Advanced Student and Program Evaluation in Special Education	3
SPED 707/807	Advanced Instructional Procedures in Special Education	3

Research

FOUN 611	Introduction to Research Methods in Education	3
FOUN 722	Introduction to Applied Statistics and Data Analysis	3
CDSE 636	Problems in Education	3
Total Hours		37-39

Special Education, K – 12 Licensure

The special education master's program prepares teachers and agency personnel to design and implement programs for individuals with disabilities in a variety of settings. This master's degree program, with endorsement, can be completed in approximately two years during which the enrolled students will specify either special education: general curriculum K – 12, early childhood special education, or special education: adapted curriculum, K - 12. Due to changing University requirements, national accreditation standards, and state licensure regulations, the programs in teacher education are under constant revision. Students are encouraged to obtain current program information from the Special Education Program website at: <http://education.odu.edu/esse/>.

The graduate licensure programs in special education, in addition to meeting the Master of Science in Education degree requirements, satisfy Virginia Board of Education teacher endorsement competencies. Graduates are prepared to work effectively with children, adolescents, and adults who require special educational services. Classroom instruction is supplemented by field experiences with children, adolescents, and adults in a variety of settings. Teacher interns have been placed in children's hospitals, special education classes in public and private facilities, regional education programs, residential psychiatric hospitals, mental health centers, and community agencies.

Graduates in special education serve as key members of child study teams and are prepared to address educational, emotional, and physical disabilities. They also find employment as educational therapists, psycho-educational diagnosticians, and special education teachers and staff members in public and private schools.

Admission

Admission to the graduate program in special education is granted by the department's graduate program director in conjunction with special education faculty. The following requirements are necessary for admission to the licensure program. Individuals who have a non-teaching B.S. or B.A. and wish to earn an M.S. Ed. and qualify for a teaching license in special education must meet the liberal arts and sciences content requirements by successfully passing the Praxis II Elementary Education: Context Knowledge test (0014; 5014).

Regular admittance requirements

1. a baccalaureate degree in the liberal arts and sciences from an accredited institution. For candidates with other degrees from accredited

institutions, successful completion of the Praxis II Elementary Education: Content Knowledge exam (0014; 5014) prior to exit from the program may be substituted to meet the liberal arts and sciences requirements. The Virginia Board of Education determines passing Praxis II scores;

2. an undergraduate grade point average of 2.80 or better in an academic content area;
3. a Graduate Record Examination (GRE) score of at least 291 (Verbal and Quantitative sections with a minimum Verbal score of 150 or better) and a 4.5 on the Analytical Writing section; Revised Graduate Record Examination (see graduate program director) OR a Miller Analogies Test (MAT) minimum score of 403;
4. a 400-500 word goal statement indicating why the student wishes to enroll in the special education program; and
5. successful completion of the Praxis Core Academic Skills for Educator Tests or equivalent according to the scores established by the Virginia Department of Education .

Provisional admittance requirements

Provisional admittance may be offered to students with marginal GRE or MAT scores or grades. In this case, the committee takes into consideration other factors. Individuals who do not meet the Praxis Core Academic Skills for Educator Tests or SAT requirements or with low test scores or a low undergraduate GPA will not be admitted to the graduate program. Provisional admittance requires:

1. a baccalaureate degree in the liberal arts and sciences from a regionally accredited institution or equivalent foreign institution. For candidates with other degrees from accredited institutions, successful completion of the Praxis II Elementary Education: Content Knowledge exam (0014; 5014) prior to exit from the program may be substituted to meet the liberal arts and sciences requirements. The Virginia Board of Education determines passing Praxis II scores;
2. an undergraduate grade point average of 2.80 or better in an academic content area;
3. a Graduate Record Examination score of at least 286 (Verbal and Quantitative sections with minimum Verbal score of 146 or better), Revised Graduate Record Examination (see graduate program director) and 4.0 on the Analytical Writing section OR a Miller Analogies Test (MAT) minimum score of 396;
4. a 400-500 word goal statement indicating why the student wishes to enroll in the special education program; and
5. successful completion of the Praxis Core Academic Skills for Educator Tests or equivalent according to the scores established by the Virginia Department of Education.

Fast Track Teacher Preparation Admission Policy

Please refer to the appropriate section in the undergraduate catalog.

Continuance

Students must:

1. complete the Pre-Task Rating Form at time of admission;
2. complete the CITI Responsible Conduct of Research training modules. See http://education.odu.edu/docs/Responsible_Conduct_of_Research_Programs.pdf;
3. maintain a grade point average of 3.00;
4. achieve a grade of B- or better in all course work and a grade of B or better in all practicum coursework;
5. successfully complete all competencies relative to their area(s) of emphasis; and
6. must successfully pass the Virginia Board of Education Professional Assessments required for licensure prior to the start of the teacher candidate internship. The following assessments must be completed with a passing score: Virginia Communication and Literacy Assessment (VCLA) with a passing composite score of 470; Praxis II Elementary Education: Content Knowledge (0014; 5014) exam with a passing score of 143; and Virginia Reading Assessment (VRA) with a passing score

of 235 or Reading for Virginia Educators (RVE) (5306) with a passing score of 157.

Exit

Students must:

1. maintain a grade point average of 3.00 and a grade of B- or better in all course work;
2. provide passing scores on the Praxis II: Elementary Education Content Knowledge assessment, the written comprehensive examination (with no more than one successful re-examination) and the internship/student teaching experience;
3. complete a Graduate Student Assessment;
4. complete the Post Task Rating Form; and
5. submit a professional portfolio according to program guidelines before the awarding of the master's degree. Candidates seeking initial special education licensure will be required to successfully complete the Virginia Reading Assessment (VRA) or Reading for Virginia Educators (RVE) assessment and the Virginia Communication and Literacy Assessment (VCLA) (see Continuance section for passing scores).
6. Candidates seeking initial special education licensure will be required to successfully complete the child abuse recognition and intervention training, technology standards for instructional personnel (TSIP), and certification/training in emergency first aid, cardiopulmonary resuscitation, and the use of automated external defibrillators.

Comprehensive Examination

All students seeking a master's degree in special education are required to complete successfully a written comprehensive examination. On this examination, students will be required to answer questions in general special education and questions from their areas of specialization. Specialization questions will be congruent with the student's academic and professional preparation. If not passed during the first administration, the exam may be repeated only one time. Failure to successfully pass the comprehensive examination will result in not completing the requirements for the Master of Science in Education.

Program Requirements

For all students who have the prerequisite undergraduate course work in special education, the master's degree requires a minimum of 30 semester hours of graduate study in special education to complete licensure. Students are expected to demonstrate dedication to special education clients and to programming in classroom and clinical settings before graduation is certified.

Special Education, K-12 Licensure – General Curriculum K-12

This program is designed to prepare professionals who are able to design and to implement appropriate educational programs for students who manifest mild disabilities. The program combines course work, supervised practica and internship to facilitate the integration of theory and practice in the development of evidence-based interventions applicable for individuals with special needs from preschool through adult in both public and private facilities. Program competencies prepare students to work in school-based programs, clinics, hospitals, and agency settings. Program practica and internship allow students opportunities to apply management, instructional and problem-solving skills in one-to-one and group settings.

Note to students in Washington State from the Student Achievement Council (SAC) concerning the Master of Science in Education (Special Education - General Curriculum K-12): Eligibility for initial educator certification in Washington is based on completion of a state approved educator preparation program. This program is approved in Virginia and is authorized for field placements in Washington by the Professional Educators Standards Board. Even though you may be residing in Washington while in this program, your application for educator certification in Washington will be processed

as an out-of-state application. Go to <http://pathway.pesb.wa.gov/outofstate> for more information. Teachers are advised to contact their individual school districts as to whether or not this program may qualify for teacher advancement.

Curriculum

Prerequisite Courses (or Undergraduate Minor or IDS in special education)

SPED 313	Fundamentals of Human Growth and Development: Birth through Adolescence	3
SPED 400/500	Foundations of Special Education: Legal Aspects and Characteristics	3
SPED 402/502	Instructional Design I: Learner Characteristics and Assessment	3
SPED 411/511	Classroom and Behavioral Management Techniques for Students with Diverse Needs	3
SPED 415/515	Instructional Design II: Curricular Procedures and Individualized Education Planning *	3
SPED 417/517	Collaboration and Transitions	3
TLED 468/568	Language Acquisition and Reading for Students with Diverse Learning Needs	3
TLED 430/530	PK-12 Instructional Technology	3

Graduate Course Work

Select two of the following:

SPED 618	Characteristics and Advanced Procedures: Emotional and Behavioral Disorders *	3
SPED 623	Characteristics and Advanced Procedures: Intellectual Disabilities *	3
SPED 625	Characteristics of Students with Autism Spectrum Disorders	3
SPED 626	Characteristics and Advanced Procedures: Learning Disabilities *	3
SPED 627	Instructional Strategies for Students with Autism Spectrum Disorders *	3

Both of the following

SPED 610	Characteristics of Students Accessing the General Curriculum	3
SPED 611	Instructional Strategies for Students accessing the General Education Curriculum *	3

Select one of the following:

READ 680	Reading to Learn Across the Curriculum	3
READ 683	Diagnostic Teaching of Reading in the Classroom	3

Required

SPED 586	Teacher Candidate Internship for Special Endorsement **	9
SPED 621	Effective Interventions for Children and Youth with Challenging Behavior *	3
SPED 720	Curriculum and Instruction: Research Into Practice	3

Total Hours 54

* Requires a practicum of 45 hours and passing scores on Praxis Core Academic Skills for Educator Tests or equivalent exemption. (See Practicum Experiences Policy)

** Pre-requisite SPED 483/SPED 583

Special Education, K-12 Licensure - Early Childhood Special Education and Special Education - Adapted Curriculum K - 12

The early childhood special education program is designed to prepare students to teach children from birth to age six who manifest disabilities or who are at risk of later school failure. Students endorsed in the area of early childhood special education will be eligible to teach in infant and preschool programs in both public and private settings. The adapted curriculum program is designed to prepare teachers to instruct individuals traditionally labeled with multiple, moderate, severe, or profound disabilities who may have disabling conditions such as cerebral palsy, autism, or a sensory impairment. Students following the early childhood special education endorsement will take the prerequisite, core, and early childhood special education course blocks and teacher candidate internship. Students wishing to be endorsed in special education: adapted curriculum will take the prerequisite, core, and adapted curriculum course blocks and teacher candidate internship.

Curriculum

Prerequisite Courses (or Undergraduate Minor or IDS in special education)

SPED 313	Fundamentals of Human Growth and Development: Birth through Adolescence	3
SPED 400/500	Foundations of Special Education: Legal Aspects and Characteristics	3
SPED 402/502	Instructional Design I: Learner Characteristics and Assessment	3
SPED 411/511	Classroom and Behavioral Management Techniques for Students with Diverse Needs	3
SPED 415/515	Instructional Design II: Curricular Procedures and Individualized Education Planning *	3
SPED 417/517	Collaboration and Transitions	3
TLED 430/530	PK-12 Instructional Technology	3

Graduate Core Courses

SPED 504	Characteristics and Medical Aspects of Disabling Conditions	3
SPED 569	Communication/Language Development/ Intervention for Students with Significant Disabilities	3
SPED 633	Teaching Students with Severe Physical and Sensorimotor Disabilities *	3
TLED 568	Language Acquisition and Reading for Students with Diverse Learning Needs	3

Early Childhood Special Education OR

SPED 630	Teaching Preschoolers with Disabilities *	3
SPED 631	Developmental and Ecological Assessment Strategies *	3
SPED 637	Infant/Family Intervention and Teamwork *	3

Special Education - Adapted Curriculum K-12 ***

SPED 621	Effective Interventions for Children and Youth with Challenging Behavior *	3
SPED 623	Characteristics and Advanced Procedures: Intellectual Disabilities *	3
SPED 625	Characteristics of Students with Autism Spectrum Disorders	3
SPED 628	Instructional Strategies for Students Accessing the Adapted Curriculum *	3

Internship 9

SPED 586	Teacher Candidate Internship for Special Endorsement **
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Total Hours 63

* Requires a 45-hour practicum and passing scores on Praxis Core Academic Skills for Educator Tests or equivalent as prescribed by the Virginia Board of Education Assessment for admission to an approved teacher education program (see Practicum Experiences Policy).

** SPED 483/SPED 583 prerequisite.

*** SPED 621 and SPED 628 are required. Choose either SPED 623 or SPED 625 for a total of nine hours.

Due to changing University requirements, national accreditation standards, and Commonwealth licensure regulations, the programs in the Darden College of Education are under constant revision. Any changes resulting from these factors supersede the program requirements described in the catalog. Students are encouraged to obtain current program information from their advisors and the Darden College of Education website at <http://education.odu.edu/>.

Post Baccalaureate Endorsement Program

Sabra Gear, Graduate Program Director
Child Study Center
(757) 683-4383

Many students who already possess an undergraduate degree enter Old Dominion University for the sole purpose of meeting Virginia's teaching licensure standards. When these students apply for admission into an approved teacher education program, they are considered to be post baccalaureate endorsement only candidates and must meet the college's policy for admitting students into an approved teacher education program. Admission to Old Dominion University does not guarantee admission into degree and/or teacher preparation programs in the Darden College of Education. The special education post baccalaureate endorsement option is available for those students who wish to pursue licensure in special education and do not meet the master's degree admission requirements or hold provisional licensure in special education and wish to complete licensure requirements.

The ODU Post Baccalaureate Endorsement Program meets Virginia Department of Education endorsement requirements. Graduates find employment as special education teachers within the continuum of services provided for children with special needs and may also serve as key members of child study teams; they are prepared to address the educational, emotional, and physical needs of students with disabilities.

Admission

Regular admittance requires:

1. completion of an undergraduate degree in the arts and sciences (or equivalent); a major in interdisciplinary studies or passing scores on Praxis II (0014; 5014) Elementary Education: Content Knowledge;
2. admission to Old Dominion University as a non-degree seeking graduate student;
3. cumulative GPA of 2.80 for all college credit courses taken in the baccalaureate degree program from an accredited college/university;
4. passing Praxis Core Academic Skills for Educator Tests or equivalent assessments scores;
5. an interview and recommendation for admittance from a department representative, Teacher Education Services advisor, or site director; and
6. submission of an application for admittance into the Darden College of Education Teacher Post-Baccalaureate Endorsement Program.

Provisional admittance requires:

1. completion of an undergraduate degree in the arts and sciences (or equivalent); a major in interdisciplinary studies or passing scores on Praxis II (0014; 5014) Elementary Education: Content Knowledge;
2. admission to Old Dominion University as a non-degree seeking graduate student;
3. cumulative GPA of 2.50-2.74 for all college credit courses taken in the baccalaureate degree program from an accredited college/university;
4. passing Praxis Core Academic Skills for Educator Tests or equivalent assessment scores;
5. an interview and recommendation for admittance from a department representative, Teacher Education Services advisor, or site director; and
6. submission of an application for admittance into the Darden College of Education Teacher Post-Baccalaureate Endorsement Program.

Continuance Requirements

1. completion of the Pre-Task Rating Form upon acceptance;
2. complete the CITI Responsible Conduct of Research training modules. See http://education.odu.edu/docs/Responsible_Conduct_of_Research_Programs.pdf;
3. successful completion of all courses required for licensure in an endorsement area(s);
4. maintenance of a GPA of 3.0 with a B- or better in all course work, and B or better in all practicum coursework; and
5. computer literacy (or completion of TLED 430/530 or demonstrated evidence of proficiency in the Virginia Department of Education Technology Standards For Instructional Personnel [TSIP]).

Exit Requirements

1. completion of the Post Task Rating form;
2. passing scores on the Reading for Virginia Educators (RVE) or Virginia Reading Assessment (VRA) and Virginia Communication and Literacy Assessment (VCLA) prior to teacher candidate internship (student teaching);
3. completion of all requirements for the program including passing scores on the Praxis II Elementary Education: Content Knowledge exam (0014; 5014)
4. completion of SPED 583 prior to teacher candidate internship (student teaching); and
5. passing scores on the Special Education Exit Exam.
6. Candidates seeking initial special education licensure will be required to successfully complete the child abuse recognition and intervention training, technology standards for instructional personnel (TSIP), and certification/training in emergency first aid, cardiopulmonary resuscitation, and the use of automated external defibrillators.

Curriculum

Special Education Endorsement Only— General Curriculum, K - 12

SPED 313	Fundamentals of Human Growth and Development: Birth through Adolescence	3
SPED 400/500	Foundations of Special Education: Legal Aspects and Characteristics	3
SPED 402/502	Instructional Design I: Learner Characteristics and Assessment	3
SPED 411/511	Classroom and Behavioral Management Techniques for Students with Diverse Needs	3

SPED 415/515	Instructional Design II: Curricular Procedures and Individualized Education Planning *	3
SPED 417/517	Collaboration and Transitions	3
TLED 468/568	Language Acquisition and Reading for Students with Diverse Learning Needs	3
SPED 610	Characteristics of Students Accessing the General Curriculum	3
SPED 611	Instructional Strategies for Students accessing the General Education Curriculum *	3
READ 680	Reading to Learn Across the Curriculum	3
TLED 430/530	PK-12 Instructional Technology	3
Internship		9
SPED 583	Field Experience Seminar in Special Education	1
SPED 586	Teacher Candidate Internship for Special Endorsement	9
Total Hours		52

* Requires a practicum of 45 hours and passing scores on Praxis Core Academic Skills for Educator Tests or equivalent as prescribed by the Virginia Board of Education Assessment for admission to an approved teacher education program (see Practicum Experiences Policy).

Early Childhood Special Education Endorsement Only

Core Requirements

SPED 313	Fundamentals of Human Growth and Development: Birth through Adolescence	3
SPED 400/500	Foundations of Special Education: Legal Aspects and Characteristics	3
SPED 415/515	Instructional Design II: Curricular Procedures and Individualized Education Planning *	3
SPED 404/504	Characteristics and Medical Aspects of Disabling Conditions	3
SPED 411/511	Classroom and Behavioral Management Techniques for Students with Diverse Needs	3
SPED 417/517	Collaboration and Transitions	3
SPED 469/569	Communication/Language Development/ Intervention for Students with Significant Disabilities	3
TLED 468/568	Language Acquisition and Reading for Students with Diverse Learning Needs	3
TLED 430/530	PK-12 Instructional Technology	3

Early Childhood Special Education Licensure Only

SPED 630	Teaching Preschoolers with Disabilities *	3
SPED 631	Developmental and Ecological Assessment Strategies *	3
SPED 637	Infant/Family Intervention and Teamwork *	3
Internship		9
SPED 583	Field Experience Seminar in Special Education	1
SPED 586	Teacher Candidate Internship for Special Endorsement	9
Total Hours		55

* Requires a practicum of 45 hours and passing scores on Praxis Core Academic Skills for Educator Tests or equivalent as prescribed by the Virginia Board of Education Assessment for admission to an approved teacher education program (see Practicum Experiences Policy).

Special Education—Adapted Curriculum, K - 12 Endorsement Only

Core Requirements

SPED 313	Fundamentals of Human Growth and Development: Birth through Adolescence	3
SPED 400/500	Foundations of Special Education: Legal Aspects and Characteristics	3
SPED 415/515	Instructional Design II: Curricular Procedures and Individualized Education Planning	3
SPED 404/504	Characteristics and Medical Aspects of Disabling Conditions	3
SPED 411/511	Classroom and Behavioral Management Techniques for Students with Diverse Needs	3
SPED 417/517	Collaboration and Transitions	3
SPED 469/569	Communication/Language Development/ Intervention for Students with Significant Disabilities	3
TLED 468/568	Language Acquisition and Reading for Students with Diverse Learning Needs	3
TLED 430/530	PK-12 Instructional Technology	3

Adapted Curriculum Licensure Only

SPED 621	Effective Interventions for Children and Youth with Challenging Behavior *	3
SPED 633	Teaching Students with Severe Physical and Sensorimotor Disabilities *	3
SPED 628	Instructional Strategies for Students Accessing the Adapted Curriculum *	3
Internship		9
SPED 583	Field Experience Seminar in Special Education	1
SPED 586	Teacher Candidate Internship for Special Endorsement	9
Total Hours		55

* Requires a practicum of 45 hours and passing scores on Praxis Core Academic Skills for Educator Tests or equivalent as prescribed by the Virginia Board of Education Assessment for admission to an approved teacher education program (see Practicum Experiences Policy).

Due to changing University requirements, national accreditation standards, and Commonwealth licensure regulations, the programs in the Darden College of Education are under constant revision. Any changes resulting from these factors supersede the program requirements described here. Students are encouraged to obtain current program information from their advisors and the Darden College of Education website at <http://education.odu.edu/>.

Special Education – Visual Impairments, PreK-12 Endorsement only

Endorsement Requirements **

SPED 400/500	Foundations of Special Education: Legal Aspects and Characteristics	3
SPED 411/511	Classroom and Behavioral Management Techniques for Students with Diverse Needs	3
SPED 417/517	Collaboration and Transitions	3

SPED 432/532	Characteristics of Students with Visual Impairments	1
SPED 433/533	Braille Code	3
SPED 434/534	Medical and Educational Implications of Visual Impairments *	3
SPED 435/535	Orientation and Mobility *	2
SPED 436/536	Curriculum and Assessment of Students with Visual Impairments *	3
SPED 437/537	Assistive Technology for People with Sensory Impairments	3
TLED 468/568	Language Acquisition and Reading for Students with Diverse Learning Needs	3
SPED 638	Teaching Methods for Students with Visual Impairments *	3
SPED 639	Braille Reading and Writing *	3
Internship		
SPED 583	Field Experience Seminar in Special Education	1
SPED 586	Teacher Candidate Internship for Special Endorsement	9
Total Hours		43

* Requires a 45-hour practicum and passing scores on Praxis Core Academic Skills for Educator Tests or equivalent as prescribed by the Virginia Board of Education assessment for admission to an approved teacher education program (see Practicum Experience Policy).

** READ 680 is recommended.

Autism Certificate Program

Old Dominion University is pleased to offer a 12 credit hour certificate program designed to prepare teachers and related service providers to effectively work and provide support for students with autism spectrum disorder (ASD). This coursework can be completed separately from, or integrated into, the Master's Degree in Special Education.

Required Courses:

SPED 625	Characteristics of Students with Autism Spectrum Disorders	3
SPED 627	Instructional Strategies for Students with Autism Spectrum Disorders *	3
SPED 569	Communication/Language Development/ Intervention for Students with Significant Disabilities	3
SPED 621	Effective Interventions for Children and Youth with Challenging Behavior *	3
Total Hours		12

* Requires practicum of 45 hours and passing scores on Praxis Core Academic Skills for Educator Tests or equivalent as prescribed by the Virginia Board of Education Assessment for admission to an approved teacher education program (see Practicum Experiences Policy).

Applied Behavior Analysis Certificate Program

As part of the Virginia Applied Behavior Analysis Consortium (VA-ABA) with George Mason University, Lynchburg College and Virginia Commonwealth University, ODU is pleased to offer an 18 credit sequence of courses leading to a post-masters certificate in applied behavior analysis (ABA). The VA-ABA Consortium is comprised of four universities: George Mason University, Lynchburg College, Old Dominion University, and Virginia Commonwealth University. Old Dominion University has opted to join the VA-ABA Consortium to help in meeting Virginia staffing needs

for ABA-certified teachers. The Consortium's primary goal is to provide teachers with instruction in applied behavior analysis that will broaden the range of empirically-supported teaching methodologies that they effectively use to meet the academic, social, and behavioral learning needs of diverse students. The Consortium's secondary goal is to provide teachers with the educational and experiential requirements needed for them to sit for the national Behavior Analyst Certification Examination. This program will be offered in a cohort model with a group of qualified students admitted once per academic year. Course work will be delivered via distance learning modalities from participating universities. An applicant must have a master's degree from a regionally accredited university or the equivalent from a foreign institution in one of the following areas: education, psychology or behavior analysis. Successful completion of the certificate program, in addition to a supervised internship that meets BACB guidelines, will allow the participant to apply for the national Board Certified Behavior Analyst (BCBA) exam. Courses required to complete the ODU Applied Behavior Analysis Certificate Program include the following courses.

SPED 640	Applied Behavior Analysis: Principles, Procedures, and Philosophy	3
SPED 641	Applied Behavior Analysis: Empirical Bases	3
SPED 642	Ethics and Professional Conduct for Behavior Analysts	3
SPED 643	Applied Behavior Analysis: Assessments and Interventions	3
SPED 644	Applied Behavior Analysis: Applications	3
SPED 645	Applied Behavior Analysis: Verbal Behavior	3
Total Hours		18

Doctor of Philosophy in Education – Special Education Concentration

Sabra Gear, Graduate Program Director

The Doctor of Philosophy is the degree most often desired for those who wish to become faculty in colleges and universities and those who aspire to senior administrative roles in institutions and agencies. The Ph.D. in special education is intended to prepare individuals for administrative and faculty positions and to provide students with the skills to carry out scholarly research, lead organizations, and create new research.

The Ph.D. in special education is designed to address the acute shortage of doctoral level special education personnel in the Commonwealth and across the nation. Program graduates will be prepared as content experts in pre-referral intervention and early intervention to assume positions of leadership as special education faculty at the university and college level. Additionally, graduates of the special education program will have the professional research skills to work with school systems to address the diverse learning needs and behavior challenges associated with the education of students with special needs and those students at risk. Program graduates will attain a degree of proficiency in research and writing that will prepare them to make contributions to the professional literatures of special education and related disciplines.

The curriculum described below contains elements that will provide research expertise, administrative skills and experience, and the ability to serve the nation's colleges, universities, and agencies providing special education services.

Admission

The criteria for admission into the Ph.D. in special education will include:

1. A completed master's degree in special education or an equivalent degree, in an appropriate discipline from a regionally accredited university. A minimum grade point (GPA) of 3.60 (on a 4.0 scale) overall for the master's degree and in the major area of study in the master's degree will be expected. In extraordinary circumstances, an individual may be accepted into the Ph.D. in special education program on a provisional status without having received a master's degree. This individual first must complete the master's degree in the

selected concentration area and meet all other admission criteria prior to beginning Ph.D. coursework;

2. An acceptable overall total score on the Graduate Record Examination (GRE) (minimum 150 on the verbal portion) and no less than a 4.5 on the writing sample. Applicants whose native language is not English must submit a current score for the Test of English as a Foreign Language (TOEFL) that meets the University's current standard;
3. Submission of a professional vitae (3 years minimum teaching experience preferred);
4. A 500-800 word statement of academic and professional goals. This statement must address how the applicant would work within the research agenda of the concentration to achieve his/her goals;
5. Three letters of reference from sources capable of commenting on the applicant's readiness for the advanced graduate study. At least two of these letters must be from an academic source;
6. Prior course work in statistics and in theories of learning. If this requirement is not met, a student may be admitted and additional course work will be added to the candidate's program of study; and
7. An on-campus interview with concentration area faculty.

Applications for admission will be reviewed by the admissions committee from the special education concentration. Admission to the special education program is competitive with the number of applications expected to exceed the number of available openings. Admission criteria will be weighted with competitive applicants invited to participate in an on campus interview. Most full time students will begin their course of study each fall semester as a cohort following a summer orientation.

Continuance

Students must:

1. maintain a grade point average of 3.00 overall;
2. complete the CITI Responsible Conduct of Research training modules. See http://education.odu.edu/docs/Responsible_Conduct_of_Research_Programs.pdf;
3. complete an annual continuance review; and
4. successfully complete all competencies relative to their program of study.

Exit

In order to complete the program, students must fully complete the curriculum below and all requirements noted elsewhere in the University catalog for graduate students and within the Ph.D. in Education Handbook. It is the responsibility of the student to obtain these materials and comply with all requirements.

Program Requirements

The Ph.D. program in special education is comprised of courses totaling a minimum of 60 academic credit hours beyond the master's degree. The curriculum includes a content concentration totaling 24 credit hours, an introductory core of nine hours, a research component including 15 credit hours, and the dissertation, which will include a minimum of 12 hours. The dissertation will often include more than 12 credit hours depending on the length of time necessary for completion. Students entering the program may also need to complete one introductory statistics course if they have not had such a course or cannot demonstrate competency at a satisfactory level. Students who come into the Ph.D. program with a master's degree in an academic field that is unrelated to special education and/or who have not completed courses to develop competency in specified areas may need to complete additional prerequisite course work.

Under normal circumstances, admissions will be offered once a year in order to build efficient cohort groups for this type of advanced study. In order to enhance the experience of the students and to increase the efficiency by which courses are offered, a cohort of 10 students will be admitted each year. This limited number of students is necessary to ensure that there is an adequate number of full-time faculty to serve the students through advising

and other duties, particularly when the cohorts reach the dissertation stage of the program.

Applicants must submit completed applications and all related material no later than February 1 of each year, and students will be admitted for study beginning in June or July of the same year.

Curriculum

Prerequisite Course work

FOUN 722	Introduction to Applied Statistics and Data Analysis	3
SPED 701/801	Historical and Contemporary Research in Special Education	3

Introductory Core

SPED 821	Critical Issues I: Readings in Special Education and Professional Writing	3
SPED 822	Critical Issues II: Research and Professional Writing	3
SPED 893	Professional Seminar: Teaching, Research, and Service	3

Research Core

FOUN 822	Applied Linear Models in Educational Research	3
FOUN 812	Research Design and Analysis	3
FOUN 813	Program Evaluation in Education	3
FOUN 814	Qualitative Research Design in Education	3
FOUN 816	Single Subject Research Designs	3

Special Education Concentration

SPED 700/800	Social/Emotional Aspects of Child Development	3
SPED 702/802	Cognitive Processes and Learning Strategies for Students with Special Needs	3
SPED 707/807	Advanced Instructional Procedures in Special Education	3
SPED 720/820	Curriculum and Instruction: Research Into Practice	3
CDSE 795/895	Topics in Education	3
SPED 868	Internship: Special Education	3
Electives *		6

Dissertation

SPED 899	Dissertation	12
Total Hours		66

* With approval of the graduate program director, elective courses may be substituted for those within the special education core. This allows students to take up to 6 hours as electives. Such substitutions must be approved in writing. Electives may be taken in other areas in the College of Education (e.g., educational leadership, higher education, early childhood education, instructional design and technology) or in other colleges with the approval of the appropriate graduate program director or department.

Due to changing University requirements, national accreditation standards, and Commonwealth licensure regulations, the programs in the Darden College of Education are under constant revision. Any changes resulting from these factors supersede the program requirements described in the catalog. Students are encouraged to obtain current program information from their advisors and the Darden College of Education website at <http://education.odu.edu/>.

Practicum Experiences Policy

A candidate may participate in a course with a practicum experience through one of two tracks:

1. A candidate may be eligible to participate in the early practicum experience course if s/he has been admitted into an approved teacher

education program. This requires that candidates pass the Praxis Core Academic Skills for Educator Tests or equivalent as prescribed by the Virginia Board of Education Assessment for admission to an approved teacher education program (see Practicum Experiences Policy). In addition, candidates must meet the GPA for their individual programs, professional education courses, and minimum grade requirements, along with any other course prerequisites.

2. A provisionally licensed teacher may participate in an early practicum course if s/he is currently employed with a school division, has a letter from the Virginia Department of Education listing the course as a needed requirement, and has passing Virginia Communication and Literacy Assessment (VCLA) scores. The provisionally licensed teacher will have to meet all the requirements of the course as stated in the syllabus.
3. Candidates seeking admission to an approved teacher education program must satisfy one of the Virginia Board of Education Prescribed Assessment for Admission to an Approved Teacher Education Program. This requirement can be satisfied by meeting a passing score in one of the selected criteria below:
 - a. Passing Praxis I composite score of 532 (before January 1, 2014) or passing scores on the Praxis Core Academic Skills for Educator Tests ; or
 - b. Approved substitute test score for Praxis I/Praxis Core Academic Skills for Educator Tests:
 - i SAT score of 1000 with at least 450 verbal and 510 mathematics taken prior to April 1, 1995; or
 - ii SAT score of 1100 with at least 530 verbal and 530 mathematics taken after April 1, 1995; or
 - iii ACT composite score of 21 with ACT mathematics score of less than 21, and ACT English plus Reading score of no less than 37, taken prior to April 1, 1995. ACT scores taken prior to 1989 are not valid; or
 - iv ACT composite score of 24 with ACT mathematics score of less than 22, and ACT English plus Reading score of no less than 46, taken after April 1, 1995; or
 - v Praxis I Math test score of 178 or Praxis Core Academic Skills for Educator Math Test score of 150 and a composite Virginia Communication and Literacy Assessment (hereafter referred to as the VCLA) composite score of 470; or
 - vi SAT Mathematics test score of at least 510 taken prior to April 1, 1995 and a VCLA composite score of 470; or
 - vii SAT Mathematics test score of at least 530 taken after April 1, 1995 and a VCLA composite score of 470; or
 - viii ACT Mathematics test score of at least 21 taken prior to April 1, 1995 and a VCLA composite score of 470; or
 - ix ACT Mathematics test score of at least 22 taken after April 1, 1995 and a VCLA composite score of 470.

Master of Science in Education – Speech Language Pathology

Child Study Center
757-683-4117

Anastasia Raymer, Graduate Program Director

This program leads to a Master of Science in Education with a major in communication sciences and disorders. The program is accredited by the Council on Academic Accreditation (CAA) in Audiology and Speech-Language Pathology affiliated with the American Speech-Language-Hearing Association (2200 Research Boulevard #310, Rockville, Maryland 20850, phone: 800-498-2071 or 301-296-5700). The program is intended to prepare professionals to understand, identify, assess and structure intervention programs for children and adults who present a wide array of speech and language disorders. Content areas of coursework include language development and disorders, articulation and phonological disorders, voice disorders, fluency disorders, hearing disorders and evaluation, dysphagia, aphasia, motor speech disorders, orofacial disorders and social dialects, among others. Students engage in supervised on-campus practica in the

university Speech and Hearing Clinic/Scottish Rite Center for Childhood Speech and Language Disorders. They also engage in off-campus practica in a variety of area hospitals, private practice settings, rehabilitation centers, clinics and public schools. Graduate students also complete a research paper in an area of their interest under the supervision of a program faculty member and must successfully pass a written comprehensive examination. All students must complete the national examination in Speech-Language Pathology (Praxis II) and essential paperwork for ASHA certification prior to graduation.

Graduates of the program hold positions as speech-language pathologists in a variety of professional settings, such as public schools, hospitals, children's hospitals, private practice agencies, and rehabilitation centers. Many graduates have become administrators, clinical supervisors and instructors at universities, and researchers.

Students with and without an undergraduate degree in communication sciences and disorders are eligible for acceptance into the program. The normal matriculation for a student who holds an undergraduate degree in the field is two full years (6 semesters) of full-time enrollment. Students who do not hold an undergraduate degree in the field typically require two additional semesters to complete prerequisite and required master's degree coursework.

Application and Admission

Application to the ODU graduate program in communication sciences and disorders takes place through Communication Sciences and Disorders Central Application System (CSDCAS, www.capsd.org/csdcas/students/php). All documents (transcripts, letters, essay) are to be submitted to CSDCAS by February 1 of each year. Students then must go to the ODU graduate application system (www.odu.edu/admission/graduate) to complete a secondary application form. No additional documents are needed with the ODU application.

Admission to the graduate program in communication sciences and disorders is granted after a competitive review completed by the graduate program director and faculty of the communication sciences and disorders program. Individuals entering the master's degree program must possess an undergraduate degree.

The following minimum requirements are necessary in order to be considered for admission to the program.

Regular admittance requires:

1. a baccalaureate degree from an institution accredited by a regional accrediting body or an equivalent degree from a foreign institution;
2. an undergraduate grade point average of 2.80 or better;
3. Graduate Record Examination (GRE) minimum scores of 146 verbal, 140 quantitative, and 4.0 analytic. Students meeting these minimal scores enter a selection pool of candidates;
4. three letters of recommendation, at least two of which should be from prior university instructors;
5. a maximum 500 word essay indicating the student's academic and professional goals as well as a description of the reasons the student believes he or she is a competitive candidate.

Continuance

Students must:

1. maintain a grade point average of 3.00;
2. satisfactorily complete all practica;
3. earn no more than two grades below B-. Students must retake courses in which grades below B- are earned and receive grades of B- or higher. Obtaining three grades below B- leads to expulsion from the program;
4. meet prerequisite competencies, including the Grammatical Categories Test, in order to be admitted to clinical practica;
5. receive permission from the faculty in order to be admitted to any clinical practicum.

Exit

Students must:

1. have a grade point average of 3.00;
2. pass the department writing proficiency examination;
3. meet all academic competencies;
4. meet all clinical competencies;
5. pass a written comprehensive examination;
6. complete Praxis II (Speech-Language Pathology);
7. successfully complete a written research project; and
8. complete an exit interview with the graduate program director.

Comprehensive Examination

All students seeking a master's degree in communication sciences and disorders are required to successfully complete a written comprehensive examination. Areas of examination are based upon program coursework and related areas of professional preparation. If any area is not successfully completed during the first administration, the student is allowed only one more attempt. Failure of any question on the second administration leads to expulsion from the program.

Program Requirements

All students who have met prerequisite requirements must complete a minimum of 36 semester hours of graduate study in communication sciences and disorders. Students are expected to satisfy all professional, academic, and clinical requirements and demonstrate ethical and interactive behaviors commensurate with the standards of the profession.

Curriculum

Prerequisite

CSD 351	Anatomy of Speech, Language, and Swallowing	3
CSD 352	Phonetics	3
CSD 450	Survey of Communication Disorders	3
CSD 451/551	Articulation and Phonological Disorders	3
CSD 452/552	Voice Disorders	3
CSD 453/553	Language Development	3
CSD 458/558	Speech and Hearing Science	3
CSD 459/559	Augmentative and Alternative Communication Methods and Materials	3
CSD 460/560	Hearing Disorders and Basic Audiometry	3
CSD 461/561	Aural Rehabilitation I	3

Required

CSD 554	Clinical Practica in Speech Pathology/Audiology I-II-III	4
CSD 649	Clinical Procedures in Speech-Language Pathology (Required for all non-ODU undergraduates; ODU undergraduates complete CSD 449W)	3
FOUN 612	Applied Research Methods in Education	3
CDSE 597	Independent Study in Special Topics in Education	1-4
CDSE 636	Problems in Education	3
CSD 650	Organic Speech-Language Disorders	3
CSD 651	Language Development and Language Disorders	3
CSD 652	Articulation and Phonological Disorders	3
CSD 654	Advanced Clinical Techniques in Speech Pathology	3
CSD 655	Cleft Palate	3
CSD 656	Theories and Therapies in Stuttering	3
CSD 657	Aphasia and Related Cognitive Disorders	3
CSD 658	Swallowing Disorders	3

CSD 660	Procedures in Audiology	3
CSD 653	Language Diagnosis and Remediation	3

Department of Counseling and Human Services

110 Education Building
757-683-3326

Danica G. Hays, Chair, dhays@odu.edu (//dhays@odu.edu)

Counseling

- Master of Science in Education
 - College Counseling
 - Clinical Mental Health Counseling
 - School Counseling
- Education Specialist
- Doctor of Philosophy in Education
 - Counselor Education
 - Leadership in Counseling

Counseling Graduate Program

The graduate program on the Norfolk campus offers a master's degree, an education specialist degree, and a Ph.D. in counseling. Master's degrees are offered in three specialty areas (college counseling, clinical mental health counseling, and school counseling).

The master's, education specialist, and doctor of philosophy degrees may be designed to meet the requirements for becoming an LPC in Virginia or a licensed school counselor in Virginia.

The master's degree program offers a curriculum that emphasizes the following core components: professional orientation and ethical practice; social and cultural diversity; human growth and development; career development; helping relationships; group work; assessment; and research and program evaluation. In addition, coursework specific to a counseling specialty is required. The program aims to stimulate within students social advocacy and systems understanding in order to reduce disparities among groups. Field placement experiences (practicum and internship) are required to assure that students are able to apply the counseling skills and knowledge they learned in the courses they completed to help clients. The admissions process, the use of experimental and didactic learning approaches, and the ongoing evaluation of students ensures that counseling students possess the personal characteristics necessary to be effective counselors.

The clinical mental health counseling specialty area prepares graduate students for careers in community mental health settings and in private practice. The clinical mental health counseling specialty includes an emphasis on diagnosis and treatment planning, psychopharmacology, and psychopathology. The program of study in the mental health counseling specialty includes all of the courses necessary to achieve licensure as a Licensed Professional Counselor (LPC) in Virginia. The school counseling specialty area engages students in the acquisition and application of knowledge relevant to a new vision of school counseling. Through content and experiential learning in both classroom settings and in the schools, graduate students are prepared to become school counselors who are systemic thinkers, leaders, partnership builders, advocates for children, and proactive professionals who embrace the belief that all children are capable of achieving at high levels. By defining the roles and functions of the school counselor in innovative ways, this new paradigm in school counseling stresses the concepts that school counselors are a major force in closing the achievement gap and that changes in students and programs will be observable and measurable. The program of study in the school counseling specialty includes all of the courses and experiences necessary to achieve licensure as a school counselor in Virginia. The college counseling specialty prepares counselors to work in institutions of higher education including community colleges, technical colleges, four-year colleges, and universities.

The education specialist (Ed.S.) degree extends counseling knowledge and skills for individuals who already hold master’s degrees in counseling. The Ed.S. degree also provides core master’s level counseling coursework for individuals who have master’s degrees in other fields who wish to become counselors.

The Ph.D. in counseling prepares individuals for employment as counselor educator faculty members in colleges and universities, and as clinicians and leaders in counseling settings in colleges, community mental health agencies, private practices, and schools. This program provides doctoral students with the skills to supervise other counselors, teach counseling skills, conduct scholarly research, lead organizations, and create new knowledge in the field of counseling.

The master’s degree program (including the three specializations) and the Ph.D. degree program are accredited by the Council for the Accreditation of Counseling and Related Programs (CACREP). CACREP does not accredit education specialist degree programs. Objectives for programs offered and other important program information can be found in the program handbooks which are located on the program web pages at <http://education.odu.edu/chs/academics/counseling/>.

Master of Science in Education - Counseling

110 Education Building
 coun@odu.edu (//coun@odu.edu)
 757-683-3326

Tim Grothaus, Graduate Program Director, tgrothau@odu.edu

Chris Wood, Graduate Program Director, wood@odu.edu
 Distance Learning Program (Program track integrating to Norfolk campus)

Admission

Applicants may hold a bachelor’s degree in any field.

Deadlines for Admission

- New students are admitted twice each year and are eligible to begin fall, spring, or summer semester.
- Fall Semester (or Summer Semester)
 - March 1 – Deadline for completed applications
- For admission for summer semester (beginning early May) or fall semester (beginning mid-August), and the final deadline for receipt of applications is March 1.
- Spring Semester
 - November 1 – Deadline for completed applications
- For admission for spring semester (beginning early January), the final deadline for receipt of applications is November 1.

Application Requirements

For details regarding the application process, criteria used to select students, materials required of applicants, where to send application materials, and taking courses prior to admission as a non-degree graduate student, see the program web site at <http://www.odu.edu/chs/academics/m-s-ed-admissionsrequirements>.

Continuance

Students must meet all University and program requirements to continue toward degree completion once they have been admitted. Students who earn three or more grades of C+ or lower will be dismissed from the Counseling graduate program. If faculty members have serious concerns about a student’s satisfactory progress in the program, they may initiate a process that could lead to the student being asked to withdraw. Students have the right to appeal decisions on continuance made by faculty

Program Completion and Exit

Students must successfully complete a written comprehensive examination and the required course of study and must have a minimum GPA of 3.00 to graduate.

Program Requirements

A minimum of 60 semester credits is required for the Master of Science in Education with a specialty in college counseling, clinical mental health counseling, or school counseling. Toward the conclusion of the program, all students must pass a comprehensive exam. All students are required to take 33 credits of common-core course work. Additional course work in specialty areas is required. All students complete a practicum and internship. Students are also required to complete the Responsible Conduct of Research Training (visit the ODU Office of Research webpage for additional information).

LPC Electives

Students in college counseling and school counseling specializations who wish to qualify to become a Licensed Professional Counselor (LPC) in Virginia should include the elective courses COUN 647 (Addictive Disorders) and COUN 691 (Family Systems and Family Development). School counseling students should also include COUN 685 (Diagnosis and Treatment Planning in Mental Health Counseling).

Curriculum

Core Courses

COUN 601	Principles of Professional Counseling and Ethics	3
COUN 631	Counseling for Lifespan Development	3
COUN 633	Counseling and Psychotherapy Techniques	3
COUN 634	Advanced Counseling and Psychotherapy Techniques	3
FOUN 611	Introduction to Research Methods in Education	3
COUN 644	Group Counseling and Psychotherapy *	3
COUN 645	Testing and Client Assessment	3
COUN 648	Foundations of Career Development	3
COUN 650	Theories of Counseling and Psychotherapy	3
COUN 655	Social and Cultural Issues in Counseling	3
COUN 669	Practicum in Counseling (100 hrs min)	3
Total Hours		33

* School counseling specialty students may substitute COUN 642.

Specialty Courses and Electives

College Counseling

COUN 685	Diagnosis and Treatment Planning in Mental Health Counseling	3
COUN 707	Adult and College Student Development	3
HIED 710	Introduction to Student Affairs Administration	3
COUN 666	Internship in College Counseling (600 hrs minimum)	6
COUN 686	College Counseling	3
COUN Electives		9
Total Hours		27

Mental Health Counseling

COUN 647	Addictive Disorders	3
COUN 670	Introduction to Counseling Supervision	3
COUN 680	Mental Health Counseling	3
COUN 685	Diagnosis and Treatment Planning in Mental Health Counseling	3
COUN 691	Family Systems and Family Development	3
COUN 667	Internship in Mental Health Counseling (600 hrs minimum)	6
COUN Electives		6
Total Hours		27

School Counseling

COUN 676	Professional Issues in School Counseling K-12	3
COUN 677	School Culture, Learning, and Classroom Management	3
COUN 678	Counseling Children and Adolescents in School Settings	3
COUN 679	School Counseling Program Development K-12	3
COUN 668	Internship in School Counseling (600 hrs minimum)	6
COUN Electives		9
Total Hours		27

Education Specialist – Counseling

110 Education Building
coun@odu.edu (//coun@odu.edu)
757-683-3326

Tim Grothaus, Graduate Program Director, tgrothau@odu.edu (//tremley@odu.edu)

The Education Specialist (Ed.S.) degree in counseling is designed to further develop and broaden students' knowledge and skills in counseling and to cultivate their capacity for leadership as professionals. The Ed.S. is suitable for master's degree level counselors who wish to earn an additional graduate degree in counseling, or for individuals with master's degrees in related fields who wish to satisfy the academic portion of the state requirements for licensure as a professional counselor or a school counselor. It is considered a terminal counseling practitioner's degree.

Admission

Applicants may hold a bachelor's degree in any field. A master's degree in counseling or another field is required.

Deadlines for Admission

- New students are admitted twice each year and are eligible to begin fall, spring, or summer semester.
- Fall Semester (or Summer Semester)
 - March 1 – Deadline for completed applications
- For admission for summer semester (beginning early May) or fall semester (beginning mid-August), the final deadline for receipt of applications is March 1.
- Spring Semester
 - November 1 – Deadline for completed applications
- For admission for spring semester (beginning early January), the final deadline for receipt of applications is November 1.

Application Requirements

For details regarding the application process, criteria used to select students, materials required of applicants, where to send application materials, and taking courses prior to admission as a non-degree graduate student, see the program web site at <http://education.odu.edu/chs/academics/counseling>.

Non-Matriculated or Non-Degree Status

Students may take a maximum of 6 credits beyond their master's degree as a non-matriculated or non-degree student before being admitted into the program.

Continuance

Students must meet all University and program requirements to continue toward degree completion once they have been admitted. Students who earn three or more grades of C+ or lower will be dismissed from the Counseling graduate program. If faculty members have serious concerns about a student's satisfactory progress in the program, they may initiate a process

that could lead to the student being asked to withdraw. Students have the right to appeal decisions on continuance made by faculty

Exit

Students must successfully complete the required course of study (a minimum of 30 credits) with a grade point average of 3.00 or better, and pass a written comprehensive examination.

Program Requirements

The Education Specialist degree in counseling requires a minimum of 30 semester hours of course work beyond the master's degree. When licensed as a professional counselor or school counselor is an objective, more than 30 semester hours usually is required.

Required Courses

Ed.S. students select courses depending on their objectives. For required courses, see the website at http://education.odu.edu/chs/academics/counseling/counseling_eds.shtml.

Doctor of Philosophy in Education – Counseling Emphasis

110 Education Building
coun@odu.edu (//coun@odu.edu)
757-683-3326

Tim Grothaus, Graduate Program Director, tgrothau@odu.edu (//tremley@odu.edu)

The Doctor of Philosophy degree in counseling prepares individuals for employment as counselor educators in colleges and universities, and as leaders in clinical mental health counseling or school counseling.

Admission

Deadlines for Admission

- November 1st of each year- Deadline for completed applications
- New students are admitted once each year and are eligible to begin fall, spring, or summer semester

For details regarding the application process, criteria used to select students, materials required of applicants, and where to send application materials, see the program website at <http://education.odu.edu/chs/academics/counseling>.

Continuance

Students must meet all University and program requirements to continue toward degree completion once they have been admitted. Students who earn three or more grades of C+ or lower will be dismissed from the Counseling graduate program. If faculty members have serious concerns about a student's satisfactory progress in the program, they may initiate a process that could lead to the student being asked to withdraw. Students have the right to appeal decisions on continuance made by faculty

Program Course Requirements

The Ph.D. program in counseling is comprised of courses totaling a minimum of 60 academic credit hours beyond the master's degree. The curriculum includes advanced courses in counseling, supervision, teaching, and research, two doctoral practicums and an internship, and 12 credits of dissertation.

Program Completion and Exit

In order to complete the program, students must complete required courses in a satisfactory manner, pass examinations, and complete an acceptable dissertation. Ph.D. students must meet all requirements included in the University Graduate Catalog, the Ph.D. in Education Handbook, and the Counseling Ph.D. Program Handbook. It is the responsibility of the student to obtain these documents and complete requirements.

Prerequisites

Graduation from a master's degree program in counseling that was accredited by the Council on Accreditation of Counseling and Related Educational Programs (CACREP) is a prerequisite. If a doctoral student's master's degree program was not accredited by CACREP, the student must take master's-level courses and field experiences they are missing as a part of their Ph.D. program. Two courses (or their equivalent) must be completed prior to entering the Ph.D. program or must be taken early in the Ph.D. program, and will not count toward the required 60 credits:

COUN 670	Introduction to Counseling Supervision	3
FOUN 722	Introduction to Applied Statistics and Data Analysis	3

Required Courses

COUN 801	Current Issues in Counseling and Counselor Education	3
COUN 820	Counselor Education Teaching and Practice	3
COUN 835	Advanced Counseling Research Design and Assessment	3
COUN 842	Advanced Counseling Theory and Practice	3
COUN 844	Advanced Group Counseling	3
COUN 846	Advanced Counseling Supervision	3
COUN 848	Multicultural Perspectives in Counselor Education, Supervision, and Research	3
COUN 868	Internship in Counseling	6
COUN 869	Advanced Supervised Practicum in Counseling	3
COUN 898	Dissertation Seminar	3
COUN 899	Dissertation	12
FOUN 813	Program Evaluation in Education	3
FOUN 814	Qualitative Research Design in Education	3
Select one of the following quantitative courses:		3
FOUN 816	Single Subject Research Designs	
FOUN 822	Applied Linear Models in Educational Research	
FOUN 823	Analysis of Variance Applied to Educational Research	
FOUN 824	Design and Analysis for Causal Inference in Educational Contexts	
FOUN 825	Applied Multilevel Modeling in Educational Research	
Select one additional COUN or FOUN 800 level course AND one additional FOUN 800 level course		6
Total Hours		60

Department of Educational Foundations and Leadership

120 Education Building
757-683-3287

Jay Scribner, Chair

Steve Myran, EFL Graduate Program Director

The Department of Educational Foundations and Leadership offers graduate programs in community college leadership (Ph.D.), educational leadership (M.S.Ed., Ed.S., Ph.D.), and higher education (M.S.Ed., Ed.S., Ph.D.).

Due to changing University requirements, national accreditation standards, and Commonwealth licensure regulations, the programs in the Darden College of Education are under constant revision. Any changes resulting from these factors supersede the program requirements described in the catalog. Students should obtain current program information from

their advisors and the Darden College of Education website at <http://www.odu.edu/education>.

Individual programs are described on the following pages.

Community College Leadership

- Doctor of Philosophy in Community College Leadership

Educational Leadership

- Master of Science in Education – Administration and Supervision with K-12 licensure
- Education Specialist – Educational Leadership with K-12 licensure
- Education Specialist – Educational Leadership
- K-12 Licensure only
- Doctor of Philosophy in Education – Educational Leadership Emphasis
- Master of Science in Education – Administration and Supervision ETMS (Education and Training Management Sub-Specialty Program)-Military Only

Higher Education

- Master of Science in Education – Higher Education
 - Student Affairs Administration
 - Leadership and Administration
 - International Higher Education Leadership
- Education Specialist
- Doctor of Philosophy in Education – Higher Education Emphasis

Continuance Policy and Procedures for all EFL Programs Policy

The following policy has been established for continuance in *all* graduate programs within the EFL department.

At the end of each semester – fall, spring, and summer – the graduate program director (GPD) will review student records. Students who do not maintain an overall GPA of at least 3.0 in their EFL program will be placed on probation. Students placed on probation have one semester to bring their overall GPA back to a minimum of 3.0. A student may be placed on probation only one time in their EFL program and will not be eligible for a second probationary period. Should a student's GPA fall below a 3.0 twice, he/she will be dismissed from the program.

Students who receive a grade of F in any EFL required or elective program course or who receive a final grade of lower than B- in more than one class in their program will be dismissed from their program by the Department Chair. A failing grade in dissertation credits for one semester places the student in probationary status and does not automatically dismiss the student from the program. However, two failing grades in dissertation credits will result in dismissal from the program. Students may follow the Grade Appeal Procedure in the ODU Graduate Catalog. In the event a grade is appealed such that the student comes into compliance with the EFL Continuance Policy, he/she will be reinstated. In accord with University policy, ODU email is considered official communication.

Doctor of Philosophy – Community College Leadership

120 Education Building
757-683-4375

Chris R. Glass, Program Coordinator

To meet the executive leadership workforce needs of the nation's community colleges, Old Dominion University has developed a Doctor of Philosophy degree in Community College Leadership. The innovative quality of this program supports the University's commitment to technology-delivered learning by implementing leadership graduate courses at each of the 23 VCCS community colleges and elsewhere in the United States through a variety of distance learning modalities including video conferencing, video streaming, asynchronous courses, and other emerging technological approaches as they are available and practical. The program is

designed for working adults, and it utilizes synchronous and asynchronous course delivery to allow students to meet their personal and professional needs while pursuing a doctoral degree.

Some of the unique community college leadership issues that are addressed in this program are: the diversity of the student body, the role of the community college in higher education, community college finances, politics and policy development, and workforce preparation and the importance of workforce preparation provided by Community Colleges.

Admission

Criteria for admission to the Ph.D. in Community College Leadership are as follows:

1. A completed master's degree in an appropriate discipline from an accredited university. Degrees that are equivalent to a master's degree such as L.L.B., J.D., and D.D.S. are also acceptable;
2. A minimum GPA of 3.5 (on a 4.0 scale) overall for the master's degree and in the major area of study in the master's degree;
3. A minimum of 1000 overall total score on the GRE with a minimum of 500 on both the verbal and quantitative sections of the GRE. Prospective students must score a minimum of 4.5 on the analytical writing portion of the GRE. These scores are minimums, so other portions of the total scores have a better chance of being accepted. Applicants should request to have their official GRE scores sent directly from the Educational Testing Service to Old Dominion University. Scores must have been earned in the last five years. In the event an applicant completes the GRE less than six weeks prior to the application deadline, the applicant should submit a letter that lists the unofficial GRE verbal and quantitative scores.
4. Applicants whose native language is not English must submit a current score for the Test of English as a Foreign Language (TOEFL) of at least 600;
5. Applicants must submit a 1500 word statement of their academic and professional goals with an emphasis on how the Ph.D. degree in community college leadership will contribute to the achievement of the stated goals;
6. Three letters of reference from sources capable of commenting on the applicant's readiness for advanced graduate study are required. At least one of these letters must be from a senior-level administrator in a community college;
7. An interview with the Community College Leadership Program Admissions Committee may be required.

Prior course work is assumed in statistics, student development, workforce development, and leadership theory. If this assumption is not met, then additional course work may be added to the candidate's graduate program of study. Please see prerequisites and additions at the bottom of the curriculum description for specifics.

Program Curriculum

The Ph.D. program in community college leadership is comprised of courses totaling a minimum of 48 academic credit hours beyond the master's degree. The curriculum includes four parts: a content concentration totaling 18 credit hours, a research component including 15 credit hours, six credit hours of electives, and the dissertation which will include a minimum of nine credit hours depending on the length of time necessary for completion.

Students entering the program may also need to complete one introductory statistics course if they have not had such a course or cannot demonstrate competency at a satisfactory level. Entering students who have not served in a senior administrative or other leadership position in a community college for a minimum of three years, will need to complete two three credit hour internships as part of their elective requirements. Students who enter the Ph.D. program with a master's degree in an academic field that is unrelated to higher education administration and/or who have not completed courses to develop competency in specified areas may need to complete specific courses in lieu of electives.

Under normal circumstances, admissions will be offered for the summer semester to build efficient cohort groups for this type of advanced study.

To enhance the experience of the students and to increase the efficiency by which courses are offered, a cohort of up to 15 students will be admitted each year.

To build a cohesive cohort group, a series of intensive courses will be offered on the Old Dominion University campus each summer. Attendance is required for all newly admitted students. Residency at a second intensive on campus seminar the following summer is expected.

Applicants must submit completed applications and all related material no later than February 1 of each year, and students will be admitted for study beginning in May of the same year.

Program Completion and Exit

To complete the program students must fully comply with the following curriculum.

Prerequisites

FOUN 611	Introduction to Research Methods in Education	3
or FOUN 612	Applied Research Methods in Education	

Community College Core (minimum 18 credits) *

CCL 820	Community College Leadership	18
CCL 824	Community College Finance	
CCL 826	Community College Curriculum and Program Development	
CCL 830	Community College Politics and Policy Development	
HIED 866	The Modern Community College	
SEPS 865	Trends and Issues of Economic and Workforce Development	

Research and Statistics (minimum 12 credits)

FOUN 722	Introduction to Applied Statistics and Data Analysis	12
FOUN 813	Program Evaluation in Education	
FOUN 822	Applied Linear Models in Educational Research	
FOUN 812	Research Design and Analysis	
FOUN 814	Qualitative Research Design in Education	

Electives (minimum 6 credits)

COUN 807	Adult and College Student Development	6
HIED 808	Contemporary Issues in Higher Education	
HIED 812	Strategic Planning and Institutional Effectiveness	
HIED 845	Today's College Student and Diversity	
HIED 852	The Law of Higher Education	
HIED 856	Higher Education Finance	
HIED 862	Development and Fund Raising	
HIED 864	College and the University Presidency	
HIED 865	Adult and Continuing Education	
HIED 893	The History of Higher Education in the United States	
HIED 894	Organization and Administration of Higher Education in the United States	
HIED 895	Topics in Higher Education Administration	
SEPS 861	Foundations of Adult Education and Training	
SEPS 862	Administration and Management of Education and Training Programs	

Dissertation Seminar

FOUN 881	Dissertation Seminar	3
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Dissertation (minimum 9 credits)

CCL 899	Dissertation	9
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Experiential Requirements **

* These six courses (18 credits) are required for all students who did not have them as part of a master's degree program. If some or all of these courses were taken as part the student's master's program, the student may select alternate courses from the Electives List in consultation with the GPD.

** One 3 credit hour internship is required for all doctoral students. Two internships are required of students who have not completed a minimum of three years of administrative experience in a Community College. It is expected that each intern will work with an administrator at the dean level or higher.

Educational Leadership Services (PK-12)

120 Education Building
757-683-5163
<http://www.odu.edu/efl>

Karen L. Sanzo, Program Coordinator

The purpose of graduate programs in educational leadership is to prepare individuals to assume leadership responsibilities in education, training, and other human service organizations. Educational leadership offers the M.S.Ed. and the Ed.S. degrees for candidates seeking PK-12 administration and supervision licensure. Educational leadership also offers the Ed.S. degree without initial licensure and the Ph.D. in educational leadership. The programs prepare leaders who are visionary, who have depth of knowledge, and who can be effective and responsive organizational leaders. The programs develop graduates who can apply research-based knowledge, skills, and dispositions that translate into effective practice through innovative program instruction and authentic field-based experiences. The emphasis area in educational administration and supervision is approved by the state of Virginia and are fully accredited by the National Council for Accreditation of Teacher Education.

The administration and supervision emphasis area is based on the standards of the National Council for Accreditation of Teacher Education and approved by the Commonwealth of Virginia. Through this program participants will develop and demonstrate competence in the following areas.

1. Candidates who complete the program are educational leaders who have the knowledge and ability to promote the success of all students by facilitating the development, articulation, implementation, and stewardship of a school or district vision of learning supported by the school community.
2. Candidates who complete the program are educational leaders who have the knowledge and ability to promote the success of all students by promoting a positive school culture, providing an effective instructional program, applying best practice to student learning, and designing comprehensive professional growth plans for staff.
3. Candidates who complete the program are educational leaders who have the knowledge and ability to promote the success of all students by managing the organization, operations, and resources in a way that promotes a safe, efficient, and effective learning environment.
4. Candidates who complete the program are educational leaders who have the knowledge and ability to promote the success of all students by collaborating with families and other community members, responding to diverse community interests and needs, and mobilizing community resources.
5. Candidates who complete the program are educational leaders who have the knowledge and ability to promote the success of all students by acting with integrity, fairly, and in an ethical manner.
6. Candidates who complete the program are educational leaders who have the knowledge and ability to promote the success of all students by understanding, responding to, and influencing the larger political, social, economic, legal, and cultural context.
7. Internship. The internship provides significant opportunities for candidates to synthesize and apply the knowledge and practice and

develop the skills identified in Standards 1 - 6 through substantial, sustained, standards-based work in real settings, planned and guided cooperatively by the institution and school district personnel for graduate credit.

Master of Science in Education - Administration and Supervision emphasis

120 Education Building
757-683-5163
<http://www.odu.edu/efl>

Karen Sanzo, Program Coordinator

Admission

To gain admission, applicants must:

1. meet all University admissions requirements;
2. have an undergraduate grade point average of 2.80 overall and 3.00 in the major;
3. provide two letters of recommendation, including one from a school administrator; and,
4. write a one page essay that explains the applicant's professional experiences and personal goals, specific ways the applicant hopes to improve public education as an educational leader, and how this degree will help the applicant address her/his professional goals.
5. write a one page, single-spaced statement about a contemporary and critical issue facing educational leaders. Address the following:
 - What is the contemporary issue and why is it critical?
 - Why is this issue relevant to school and/or division leaders?
 - What role should school and/or division leaders play in addressing this issue and how?

In addition, all students who wish to enter the administration and supervision program with Commonwealth of Virginia accreditation must satisfactorily complete an administrative skills portfolio assessment process. ELS 700 must be the first course in which students enroll. Non-degree students may not take more than two ELS courses prior to admission. Performance in classes as a non-degree student will not guarantee admission into the program.

Exit

Students must successfully complete:

1. the School Leaders Licensure Assessment (SLLA);
2. the required course of study;
3. three self assessments, one at the start of the program, one after the first internship, and one upon completion of all coursework;
4. Two internships of 320 hours and 5 placements per VDOE administrative licensure regulations; and,
5. have a minimum 3.00 grade point average in order to graduate.

Program Requirements

For the Master of Science in Education with an emphasis in administration and supervision, a student must have completed an approved 30-hour minimum graduate program including two internships and a culminating written comprehensive examination. Approved internship experiences are required by the Commonwealth of Virginia.

Administration and Supervision Preparation for Public School Pre K-12 Licensure

Requirements for this emphasis area are as follows.

Prerequisite/Corequisite

ELS 700	Leadership and Management for School Improvement	3
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Curriculum

ELS 701	Accountability and Organizational Improvement	3
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ELS 702	Educational Politics and Policymaking	3
ELS 710	Strategic Communication and External Relations	3
ELS 727	Learning Theories and Professional Development	3
ELS 728	Instructional Leadership and Supervision	3
ELS 753	Educational Finance and Budgeting	3
ELS 757	Educational Law and Ethics	3
Clinical Experience		
ELS 668	Internship in Educational Leadership	3
ELS 669	Instructional Internship	3
Total Hours		30

* This course must be taken first and include the start of an Administration Portfolio Skills Assessment.

Education Specialist with Licensure Program

<http://www.odu.edu/efl>

Karen Sanzo, Program Coordinator

Students who have a master's degree in another area and do not have a license in administration supervision PreK-12 may be accepted into the Ed.S. with Licensure Program. These students would complete the following 33 semester hours of coursework to lead to licensure as an administrator.

Admission

To gain admission, applicants must:

1. meet all University admissions requirements;
2. have an undergraduate grade point average of 2.80 overall and 3.00 in the major;
3. provide two letters of recommendation, including one from a school administrator; and,
4. write a one page essay that explains the applicant's professional experiences and personal goals, specific ways the applicant hopes to improve public education as an educational leader, and how this degree will help the applicant address her/his professional goals.
5. write a one page, single-spaced statement about a contemporary and critical issue facing educational leaders. Address the following:
 - What is the contemporary issue and why is it critical?
 - Why is this issue relevant to school and/or division leaders?
 - What role should school and/or division leaders play in addressing this issue and how?

In addition, all students who wish to enter the administration and supervision program with Commonwealth of Virginia accreditation must satisfactorily complete an administrative skills portfolio assessment process. ELS 800 must be the first course in which students enroll. Non-degree students may not take more than two ELS courses prior to admission. Performance in classes as a non-degree student will not guarantee admission into the program.

Exit

Students must successfully complete:

1. the School Leaders Licensure Assessment (SLLA);
2. the required course of study;
3. three self assessments, one at the start of the program, one after the first internship, and one upon completion of all coursework;
4. Two internships of 320 hours and 5 placements per VDOE administrative licensure regulations; and,
5. have a minimum 3.00 grade point average in order to graduate.

Curriculum

Prerequisite/Corequisite

ELS 800	Strategic Leadership and Management for School Improvement (Curriculum)	3
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Course Requirements

ELS 801	Accountability and Organizational Improvement	3
ELS 802	Educational Politics and Policymaking	3
ELS 810	Strategic Communication and External Relations	3
ELS 827	Learning Theories and Professional Development	3
ELS 828	Instructional Leadership and Supervision	3
ELS 853	Educational Finance and Budgeting	3
ELS 857	Educational Law and Ethics	3
ELS 660	Program Evaluation, Research and Planning	3

Clinical Experience

ELS 668	Internship in Educational Leadership (Clinical Experience) *	3
ELS 669	Instructional Internship (Clinical Experience) *	3

Total Hours		33
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* The classes marked with an asterisk are required classes for licensure.

** Other doctoral-level classes may be taken in consultation with your advisor.

Students must successfully complete the School Leaders Licensure Assessment (SLLA).

Education Specialist—Educational Leadership

120 Education Building
757-683-5163
<http://www.odu.edu/efl>

Karen Sanzo, Program Coordinator

The Education Specialist (Ed.S.) program is designed to provide further opportunities for holders of master's degrees to develop expertise at a higher professional level. Emphasis is on continued development for leadership in policy formulation, planning, and executive action related to educational and training institutions and human service organizations. Individuals who aspire to advance in educational leadership will find in this program a meaningful base for building toward their professional objectives. The Ed.S. program in educational leadership includes emphasis areas in administration and supervision and in higher education.

Admission

Students must:

1. meet all University requirements;
2. provide two letters of recommendation;
3. hold a master's degree from an accredited institution (minimum 3.25 graduate grade point average on a 4.00 scale); and,
4. provide a one-page essay explaining why he/she should be admitted into the program.
5. Applicants whose admission credentials are slightly below the required minimum will be considered for provisional admission. Performance in classes as a non-degree student will not be taken into consideration in the admission process.

Continuance

Students must meet all University requirements and maintain a 3.00 or higher grade point average.

Exit

Students must successfully complete:

1. a written comprehensive examination;
2. the required course of study; and,
3. have a 3.00 grade point average or above.

Education Specialist Program Requirements

The Ed.S. requires the completion of a minimum of 30 approved semester credit hours consisting of at least 18 hours at the 800 level.

Course Requirements

ELS 835	Organizational Theory and Behavior in Education	3
ELS 853	Educational Finance and Budgeting	3
ELS 871	Educational Systems Planning and Futures	3
ELS 876	Leadership for Social Justice	3
ELS 878	Leadership for Teaching and Learning	3
ELS 879	Field Research in School Administration and Supervision	3
FOUN 722	Introduction to Applied Statistics and Data Analysis	3
Select three Electives from the following:		9
ELS 811	Leadership Theory for Educational Improvement	
ELS 864	History and Philosophy of American Public School Reform	
ELS 873	Advanced School Law	
ELS 880	Multicultural Curriculum Leadership and Globalization	
ELS 883	Contemporary Issues in Education	
Total Hours		30

Doctor of Philosophy in Education– Educational Leadership Emphasis

Karen Sanzo, Program Coordinator

<http://www.odu.edu/efl>

Program Requirements

The Ph.D. program in educational leadership consists of a minimum of 48 academic credit hours beyond the master's degree and a minimum of 12 credits for the dissertation. The curriculum includes four parts: an introductory course (3 credits), elective (3 credits), the research core (15 credits), the ELS concentration specific courses (24 hours), and the capstone course (3 credits). The dissertation will include a minimum of 12 credit hours. Students entering the program may also need to complete one or more introductory statistics course if they have not had such a course or cannot demonstrate competency at a satisfactory level. Students who come into the Ph.D. program with a master's degree in an academic field that is unrelated to educational leadership and/or who have not completed courses to develop competency in specified areas may need to complete other courses in lieu of electives.

Admission is on a rolling basis. Students can commence their programs of study during the semester immediately following admission.

Program Completion and Exit

In order to complete the program students must fully comply with the curriculum below and achieve a GPA of 3.00 or higher.

- Educational Leadership Curriculum - 48 credits
- Dissertation - 12 credits minimum

Prerequisites

ELS 660	Program Evaluation, Research and Planning	3
or FOUN 611	Introduction to Research Methods in Education	
or FOUN 612	Applied Research Methods in Education	
FOUN 722	Introduction to Applied Statistics and Data Analysis (or equivalent)	3

Research Core

ELS 831	Accountability Systems in Public Education	3
FOUN 822	Applied Linear Models in Educational Research	3
or FOUN 823	Analysis of Variance Applied to Educational Research	
FOUN 812	Research Design and Analysis	3
FOUN 814	Qualitative Research Design in Education	3
FOUN 813	Program Evaluation in Education	3

Educational Leadership and Services Concentration Courses

ELS 811	Leadership Theory for Educational Improvement	3
ELS 815	Leadership for Equity and Inclusive Education	3
ELS 821	Policy and Politics in Educational Leadership	3
ELS 835	Organizational Theory and Behavior in Education	3
ELS 876	Leadership for Social Justice	3
ELS 878	Leadership for Teaching and Learning	3

Select four Electives from the following (other electives may be substituted with advisor approval): *

ELS 864	History and Philosophy of American Public School Reform	
ELS 871	Educational Systems Planning and Futures	
ELS 874	Advanced School Finance, and Operations	
ELS 880	Multicultural Curriculum Leadership and Globalization	
ELS 883	Contemporary Issues in Education	

Capstone Course

FOUN 881	Dissertation Seminar	3
Dissertation (minimum 12 hours)		12
ELS 899	Dissertation	
Total Hours		66

* With advisor approval, two of these courses may be substituted with courses outside of the educational leadership program to allow students to form cognate areas.

Continuance Requirements

At the end of each semester – fall, spring, and summer – the graduate program director reviews records of students who do not maintain a 3.00 cumulative grade point average (GPA). Graduate students, whether degree or non-degree seeking, who do not have a cumulative GPA of at least 3.00 will be placed on probation. In addition, students must be continuously enrolled in the cohort.

Higher Education

The department offers, emphasis areas in higher education in the M.S.Ed. and Ed.S. degrees as well as the Ph.D. in higher education.

Master of Science in Education - Higher Education Emphasis

120 Education Building

Chris R. Glass, Program Coordinator

The Higher Education program offers graduate degrees that prepare students seeking advanced leadership positions in colleges, universities, non-profit organizations, or educational associations related to postsecondary/tertiary education. The program has specialized curricular tracks in student affairs administration, international higher education leadership, and leadership and administration. Students gain professional experience through internships with a wide-variety of colleges, universities, agencies, and associations in the U.S. and abroad. A capstone experience engages students in real-life research projects that are commissioned by university and community leaders. The program meets the requirements for graduate programs of the American College Personnel Association (ACPA), the National Association of Student Personnel Administrators (NASPA), and the Association for the Study of Higher Education (ASHE). The program meets standards established by the Council for the Advancement of Standards in Higher Education (CAS).

Admission

Prospective students seeking admission to the Master's degree program in Higher Education must:

1. meet all University admission requirements as listed in the Old Dominion University Catalog;
2. have earned an undergraduate grade point average of 2.80 overall and 3.00 in the major;
3. provide two letters of recommendation from an administrator or faculty member at the student's undergraduate institution (one letter should come from a person who has supervised the student in a student leadership position or who can comment on the student's potential for work in a higher education setting, the other may come from another person who can comment on the students' academic ability);
4. provide a one page essay of at least 500 words describing goals for graduate work and career goals;
5. have an acceptable score on the Graduate Record Examination (GRE) or Miller Analogies Test (MAT); and
6. provide a resume that describes the applicant's work and education history.

Applicants whose admission credentials are slightly below the required minimum will be considered for provisional admission.

Non-degree students are limited to a maximum of two HIED, CCL, and/or FOUN courses prior to admission unless they receive permission from the program coordinator. Non-degree students must receive academic advising by a Higher Education program faculty member prior to enrollment in any course as a non-degree student. Performance in classes as a non-degree student will not guarantee admission into the program.

Continuance

Students must meet all department, college, and university policy requirements for continuation in their academic program. See department policy above.

Exit

In order to graduate from the program, students must successfully complete:

1. the required course of study for a total of at least 42 credit hours of coursework; and
2. pass a written comprehensive examination.

Program Requirements

In order to complete the course of study for the degree of Master of Science in Higher Education, a student must fulfill the requirements noted above.

Curriculum

Higher Education - Student Affairs Administration

The Student Affairs Administration track prepares professionals for positions in student affairs, including academic advising, admissions, campus activities, greek life, judicial affairs, multicultural affairs, orientation, and residence life and housing.

Core Courses		12
FOUN 611	Introduction to Research Methods in Education	
HIED 708	Contemporary Issues in Higher Education	
HIED 752	The Law of Higher Education	
HIED 757	The Multicultural University	
Cognate		21
HIED 710	Introduction to Student Affairs Administration	
HIED 733	Professional Helping Skills in Higher Education	
HIED 745	Today's College Student and Diversity	
HIED 758	Higher Education Leadership	
COUN 707	Adult and College Student Development	
Select two from the following:		
HIED 712	Strategic Planning and Institutional Effectiveness	
HIED 720	The Private College and University	
HIED 743	Introduction to International Higher Education Administration	
HIED 756	Higher Education Finance	
HIED 762	Development and Fund Raising	
HIED 763	Case Studies in Higher Education	
HIED 764	College and the University Presidency	
HIED 765	Adult and Continuing Education	
HIED 766	The Modern Community College	
HIED 770	External and Internal Relations for Higher Education	
HIED 771	American Higher Education in a Global Context	
HIED 794	Organization and Administration of Higher Education in the United States	
COUN 648	Foundations of Career Development	
Field Experiences		9
HIED 668	Internship in Higher Education Administration (A)	
HIED 668	Internship in Higher Education Administration (B)	
or HIED 744	Comparative Higher Education Systems	
HIED 761	Higher Education Capstone	
Total Hours		42

Higher Education - Leadership and Administration

The Leadership and Administration track prepares professionals for positions in mid- and senior-level positions in academic affairs in colleges, universities, agencies, and associations.

Core Courses		12
FOUN 611	Introduction to Research Methods in Education	
HIED 708	Contemporary Issues in Higher Education	
HIED 752	The Law of Higher Education	
HIED 757	The Multicultural University	
Cognate		21

HIED 712	Strategic Planning and Institutional Effectiveness
HIED 756	Higher Education Finance
HIED 758	Higher Education Leadership
HIED 794	Organization and Administration of Higher Education in the United States
Select three from the following:	
HIED 764	College and the University Presidency
HIED 770	External and Internal Relations for Higher Education
HIED 720	The Private College and University
HIED 762	Development and Fund Raising
HIED 763	Case Studies in Higher Education
HIED 765	Adult and Continuing Education
Field Experiences	9
HIED 668	Internship in Higher Education Administration (A)
HIED 668	Internship in Higher Education Administration (B)
or HIED 744	Comparative Higher Education Systems
HIED 761	Higher Education Capstone
Total Hours	42

Higher Education - International Higher Education Leadership

The International Higher Education Leadership track prepares professionals for positions in international education, including study abroad, international student and scholar services, international campus programming, and higher education for international development.

Core Courses	12
FOUN 611	Introduction to Research Methods in Education
HIED 708	Contemporary Issues in Higher Education
HIED 752	The Law of Higher Education
HIED 757	The Multicultural University
Cognate	21
HIED 743	Introduction to International Higher Education Administration
HIED 744	Comparative Higher Education Systems
HIED 771	American Higher Education in a Global Context
HIED 794	Organization and Administration of Higher Education in the United States
IS 741	Globalization and Social Change in the World System
IS 760	International Cultural Studies: History, Theory and Application
Select one from the following:	
HIED 710	Introduction to Student Affairs Administration
HIED 712	Strategic Planning and Institutional Effectiveness
HIED 720	The Private College and University
HIED 733	Professional Helping Skills in Higher Education
HIED 745	Today's College Student and Diversity
HIED 756	Higher Education Finance
HIED 758	Higher Education Leadership
HIED 793	The History of Higher Education in the United States
HIED 762	Development and Fund Raising
HIED 763	Case Studies in Higher Education

HIED 764	College and the University Presidency
HIED 765	Adult and Continuing Education
HIED 766	The Modern Community College
HIED 770	External and Internal Relations for Higher Education
COUN 648	Foundations of Career Development
COUN 707	Adult and College Student Development
Field Experiences	9
HIED 668	Internship in Higher Education Administration (A)
HIED 668	Internship in Higher Education Administration (B)
or HIED 744	Comparative Higher Education Systems
HIED 761	Higher Education Capstone
Total Hours	42

Special Courses

These courses may be used for a variety of specialized topical seminars and may fulfill requirements in one or more of the cognate areas noted above.

HIED 795	Topics in Higher Education Administration	1-6
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Education Specialist – Emphasis in Higher Education

Chris R. Glass, Program Coordinator

The Education Specialist program is designed to provide further opportunities for those with Master's degrees in Higher Education – and related disciplines – to develop further expertise. Individuals seeking advanced leadership positions will find in this program a meaningful base for building toward their professional objectives. Emphasis is on continued professional development for leadership in executive leadership, strategic planning, policy formulation in colleges, universities, non-profit organizations, or educational associations related to postsecondary/tertiary education.

Admission

Students must:

1. meet all University admission requirements as listed in the Old Dominion University Catalog;
2. provide two letters of recommendation;
3. hold a master's degree from an accredited institution (minimum 3.25 graduate grade point average on a 4.00 scale);
4. provide a 1500 word essay explaining why he/she should be admitted into the program; and
5. have an acceptable score on the Graduate Record Examination (GRE).

Applicants whose admission credentials are slightly below the required minimum will be considered for provisional admission.

Non-degree students are limited to a maximum of two HIED, CCL, and/or FOUN courses prior to admission unless they receive permission from the program coordinator. Non-degree students must receive academic advising by a Higher Education program faculty member prior to enrollment in any course as a non-degree student. Performance in classes as a non-degree student will not guarantee admission into the program.

Continuance

Students must meet all department, college, and university policy requirements for continuation in their academic program. See department policy above.

Exit

Students must successfully complete:

1. a written comprehensive examination with a grade of "pass";
2. the required course of study; and
3. have a 3.00 grade point average or above.

Program Requirements

The Education Specialist in higher education requires the completion of a minimum of 30 approved semester credit hours beyond the master's degree. Because of the wide variation of backgrounds among students seeking this degree, the curricular requirements will be determined based upon the applicant's background.

Education Specialist in Higher Education

Required Courses* 18

Students, with the assistance of their advisor, will choose six courses from the following that do not repeat courses taken for the Master's degree:		
HIED 808	Contemporary Issues in Higher Education	
HIED 810	Introduction to Student Affairs Administration	
HIED 812	Strategic Planning and Institutional Effectiveness	
HIED 820	The Private College and University	
HIED 825	Higher Education Policy	
HIED 833	Professional Helping Skills in Higher Education	
HIED 843	Introduction to International Higher Education Administration	
HIED 844	Comparative Higher Education Systems	
HIED 845	Today's College Student and Diversity	
HIED 852	The Law of Higher Education	
HIED 856	Higher Education Finance	
HIED 857	The Multicultural University	
HIED 858	Higher Education Leadership	
HIED 862	Development and Fund Raising	
HIED 863	Case Studies in Higher Education	
HIED 864	College and the University Presidency	
HIED 865	Adult and Continuing Education	
HIED 866	The Modern Community College	
HIED 870	External and Internal Relations for Higher Education	
HIED 871	American Higher Education in a Global Context	
HIED 893	The History of Higher Education in the United States	
HIED 894	Organization and Administration of Higher Education in the United States	
CCL 820	Community College Leadership	
CCL 824	Community College Finance	
CCL 826	Community College Curriculum and Program Development	
CCL 830	Community College Politics and Policy Development	
COUN 807	Adult and College Student Development	
Research Courses		9
FOUN 722	Introduction to Applied Statistics and Data Analysis	
FOUN 813	Program Evaluation in Education	
FOUN 812	Research Design and Analysis	
Field Experience		3
HIED 868	Internship: Higher Education Administration	

or HIED 744 Comparative Higher Education Systems

Total Hours		30
* Required courses must include the following if they have not already been taken at the 700 level within a Master's degree program		
HIED 808	Contemporary Issues in Higher Education	3
HIED 856	Higher Education Finance	3
HIED 857	The Multicultural University	3
HIED 893	The History of Higher Education in the United States	3
HIED 894	Organization and Administration of Higher Education in the United States	3
Total Hours		15

Special Courses

These courses may be used for a variety of specialized topical seminars and may fulfill requirements in one or more of the cognate areas noted above.

HIED 895	Topics in Higher Education Administration	1-6
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Doctor of Philosophy in Education - Higher Education Emphasis

Chris R. Glass, Program Coordinator

The Doctor of Philosophy is the degree most often desired for those who aspire to senior administrative and faculty roles in institutions of higher education. Possession of this degree also provides those who have earned it with entry into business, government, research, and other leadership positions. The Ph.D. in higher education is intended to prepare individuals for administrative and faculty positions and to provide these students with the skills to carry out scholarly research, lead organizations, and create new knowledge. The curriculum described below contains elements that will, if completed successfully, provide research expertise, administrative skills and experience, and the ability to serve the nation's colleges and universities and contribute to higher education elsewhere in the world.

Admission

Criteria for admission to the Ph.D. in higher education are as follows:

1. A completed master's degree in an appropriate discipline from a regionally accredited university. Degrees that are equivalent to a master's degree such as L.L.B., J.D., and D.D.S. are also acceptable;
2. A preferred minimum GPA of 3.5 (on a 4.0 scale) overall for the Master's degree and in the major area of study in the Master's degree;
3. A minimum of 300 overall total score on the GRE and a preferred score of 151 or above on the verbal and 149 on the quantitative sections of the GRE. Prospective students must score a minimum of 4.5 on the analytical writing portion of the GRE. GRE scores expire after five years. However, scores older than five years may be accepted if they come directly from the institution from which the applicant received his or her highest degree. A note from this institution's registrar must be included stating that these scores were sent to the institution directly from Educational Testing Service. While these scores are minimums, other portions of the total application package will be strongly considered to balance lower scores;
4. Applicants whose native language is not English must submit a current score for the Test of English as a Foreign Language (TOEFL) of at least 550;
5. Applicants must submit a 1500 word statement of their academic and professional goals with an emphasis on how the Ph.D. degree in higher education will contribute to the achievement of the stated goals;
6. Three letters of reference from sources capable of commenting on the applicant's readiness for advanced graduate study. At least one of these letters must be from a senior-level administrator in a college or university;

7. An interview with the Higher Education Program Committee. This committee will also review applications for admission; and
8. Prior course work is assumed in statistics, student development, and leadership theory. If this is not the case, then additional course work will be added to the candidate's graduate program of study.

Non-degree students are limited to a maximum of two HIED, CCL, and/or FOUN courses prior to admission unless they receive permission from the program coordinator. Non-degree students must receive academic advising by a Higher Education program faculty member prior to enrollment in any course as a non-degree student. Performance in classes as a non-degree student will not guarantee admission into the program.

Continuance

Students must meet all department, college, and university policy requirements for continuation in their academic program. See department policy above. After completion of coursework, students must be enrolled in either a dissertation credit course or HIED 999 until graduation. Please see the Ph.D. in Education Handbook for more details.

Program Requirements

The Ph.D. program in higher education consists of courses totaling a minimum of 60 academic credit hours beyond the Master's degree. The curriculum includes four parts: core coursework (18 credits), a content concentration (12 credits minimum), research courses (15 credits), and dissertation seminar (3 credits) followed by the dissertation (12 credits minimum). The dissertation may include more than 12 credit hours depending on the length of time necessary for completion. Students entering the program may also need to complete an introductory statistics course and a research methods course if they have no prior coursework in educational research or do not demonstrate competency at a satisfactory level. If students have not yet served in an administrative or other leadership position in a college or university for a minimum of three years, completion of six credit hours of an internship is required. Students who come into the Ph.D. program with a Master's degree in an academic field unrelated to Higher Education and/or who need to develop competency in specific content areas will work with their advisor to identify cognate courses that develop their competency in key content areas in Higher Education.

Under normal circumstances, admission is offered once a year in order to build cohesive cohort groups. A cohort of 5-10 students will be admitted each year. To enhance the experience of the students and build cohesive cohorts, a series of intensive courses will be offered on the Old Dominion University campus each summer. Newly admitted students are expected to come to campus the summer after they are admitted to the program and complete two courses together as a group. These courses will be selected from within the core courses or research requirements. A third cognate course may be available for regular study during the summer so that students may comply with one of the residency requirements. Residency at a second intensive seminar the following summer is recommended but not required.

A minimum of two semesters of full-time study is required of students in the program to meet program residency requirements. One of the semesters of full-time study (defined as completion of nine credit hours) must be accomplished by the completion of the intensive seminar institute noted above. The second semester of residency can be accomplished in several ways. Students may complete nine credit hours during Fall or Spring or three hours in the summer or may attend a second summer institute. Courses taken online are considered resident courses, so that taking three online courses during a semester may complete the second residency requirement.

Applicants must submit completed applications and all related material no later than February 1 of each year, and students will be admitted for study beginning in June of the same year.

Exit

In order to complete the program students must fully comply with the curriculum below and with all requirements noted elsewhere in the University catalog for graduate students and with requirements listed in the

Ph.D. in Education Handbook. It is the responsibility of the student to obtain these materials and comply with required portions.

Curriculum

Prerequisites *

FOUN 611	Introduction to Research Methods in Education
FOUN 722	Introduction to Applied Statistics and Data Analysis

Core Courses 18

HIED 808	Contemporary Issues in Higher Education
HIED 809	Proseminar in Higher Education
HIED 825	Higher Education Policy
HIED 856	Higher Education Finance
HIED 857	The Multicultural University
HIED 893	The History of Higher Education in the United States

Cognate (12 credits minimum) ** 12

HIED 810	Introduction to Student Affairs Administration
HIED 812	Strategic Planning and Institutional Effectiveness
HIED 820	The Private College and University
HIED 833	Professional Helping Skills in Higher Education
HIED 843	Introduction to International Higher Education Administration
HIED 844	Comparative Higher Education Systems
HIED 845	Today's College Student and Diversity
HIED 852	The Law of Higher Education
HIED 858	Higher Education Leadership
HIED 862	Development and Fund Raising
HIED 863	Case Studies in Higher Education
HIED 864	College and the University Presidency
HIED 865	Adult and Continuing Education
HIED 866	The Modern Community College
HIED 870	External and Internal Relations for Higher Education
HIED 871	American Higher Education in a Global Context
HIED 894	Organization and Administration of Higher Education in the United States
CCL 820	Community College Leadership
CCL 824	Community College Finance
CCL 826	Community College Curriculum and Program Development
CCL 830	Community College Politics and Policy Development
COUN 807	Adult and College Student Development
IS 841	Globalization and Social Change in the World System
IS 813	Global Political Economy
IS 860	International Cultural Studies: History, Theory and Application

Research 15

FOUN 813	Program Evaluation in Education
FOUN 822	Applied Linear Models in Educational Research
or FOUN 823	Analysis of Variance Applied to Educational Research
FOUN 812	Research Design and Analysis
FOUN 814	Qualitative Research Design in Education

Select one advanced research course from the following:	
FOUN 815	Advanced Qualitative Research
FOUN 824	Design and Analysis for Causal Inference in Educational Contexts
FOUN 825	Applied Multilevel Modeling in Educational Research
FOUN 826	Applied Structural Equation Modeling in Educational Research
FOUN 827	Applied Logistic Regression
FOUN 840	Educational Measurement and Assessment
Dissertation	15
FOUN 881	Dissertation Seminar
HIED 899	Dissertation (12 credits minimum)
Total Hours	60

* Doctoral students with no prior coursework in educational research must enroll in FOUN 611 and FOUN 722.

** Students who enter the PhD program have diverse backgrounds, experiences, and goals. For this reason they have the ability, through consultation with their advisor, to tailor the cognate chosen to fulfill their degree obligations towards these goals. Cognate courses may be taken in the following departments: Community College Leadership, Foundations, Higher Education, International Studies, and Sports Management. The program coordinator may allow other cognate areas to be developed and implemented by students and advisors upon request if a particular justification is made in writing.

*** Some courses may be waived based on previous study.

Additions

Internship in Higher Education Administration (6 credits) is required for all doctoral students who have not served in a full-time administrative position for at least three years prior to admission. Those students interested in community colleges may substitute CCL 868 – Internship in Community College Administration. It is expected that each intern will work with an administrator at the dean level or higher.

Special Courses

These courses may be used for a variety of specialized topical seminars and may fulfill requirements in one or more of the cognate areas noted above.

HIED 895	Topics in Higher Education Administration	1-6
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Department of Human Movement Sciences

2007 Student Recreation Center
757 683-4995
757 683-4270

Lynn L. Ridinger, Chair

The Department of Human Movement Sciences offers programs leading to the Master of Science in Education with a concentration in physical education, and the Doctor of Philosophy in Education - Human Movement Sciences concentration with emphasis areas in Applied Kinesiology and Sport and Recreation Management. The Master of Science in Education with a concentration in physical education includes emphasis areas in athletic training, athletic training with Initial Virginia Licensure in physical education and health education, curriculum and instruction, curriculum and instruction with Initial Virginia Licensure in physical education and health education, exercise science and wellness, and sport management.

Due to changing University requirements, national accreditation standards, and Commonwealth licensure regulations, the programs in the Darden College of Education are under constant revision. Any changes resulting from these factors supersede the program requirements described in the catalog. Students should obtain current program information from

their advisors and the Darden College of Education website at <http://www.odu.edu/education>.

Master of Science in Education – Physical Education

David Swain - Departmental Graduate Program Director
2024 Student Recreation Center
757-683-2024
dswain@odu.edu (lriding@odu.edu)

The department offers a varied graduate program that includes three separate tracks and seven emphasis areas. The three tracks are as follows:

1. thesis research (30 credit hours minimum, including a six-credit-hour thesis);
2. research problem (33 credit hours minimum, including a three-credit-hour research problem);
3. non-research (36 credit hours minimum).

The sport management, exercise science and wellness, and curriculum and instruction emphasis areas contain a minimum of 36 credit hours to graduate. The athletic training emphasis area contains a minimum of 39 credit hours to graduate and the athletic training with Initial Virginia Licensure in physical education and health education could contain up to 73 credit hours to graduate in order to fulfill both area requirements. The curriculum and instruction emphasis area includes a program for currently licensed teachers as well as a program that leads to initial PK-12 health/physical education teacher licensure in the Commonwealth of Virginia.

Physical Education Curriculum and Instruction Emphasis

Xihe Zhu, Graduate Coordinator
2010 Student Recreation Center
757-683-3534

Admission and Entrance Requirements

Students applying for admission with regular status must have:

1. a bachelor's degree from an accredited institution with a cumulative undergraduate grade point average (GPA) of 2.80 and a GPA of 3.00 in the undergraduate major courses;
2. a score of at least 291 (900 by former scoring standard) in the quantitative and verbal portions of the Graduate Record Examination (GRE) - GRE scores are required for consideration of admission for all candidates. (In some circumstances, students who have either a low GPA or a low GRE score may be considered for admission with provisional status); and
3. demonstrated computer literacy.

Continuance and Exit Requirements

Students must meet all requirements for continuance as outlined in the graduate continuance policy for the University. Students completing the program of study must:

1. achieve an overall GPA of 3.0 and a GPA of 3.0 in the major courses;
2. demonstrate writing proficiency;
3. satisfy all course competencies;
4. pass a comprehensive examination when required;
5. complete an internship, research project, or thesis as a culminating experience;
6. hold an exit interview with the program coordinator; and
7. file the necessary paperwork for graduation.

Curriculum

Research Core	6
FOUN 722	Introduction to Applied Statistics and Data Analysis

FOUN 612	Applied Research Methods in Education	
Core Courses		15
HMS 601	Adapted Physical Education Design and Supervision	
HMS 606	Planning and Administration of an Effective Health and Physical Education Program	
HMS 720	Curriculum Development in Physical Education	
HMS 739	Current Research in Motor Development	
HMS 740	Principles and Concepts of Motor Learning	
HMS 745	Assessment and Evaluation in Physical Education	
Thesis Track		15
Includes 6 credit hours for Thesis and 9 credit hours for electives		
HMS 698	Thesis	
HMS 699	Thesis	
Electives		
Research-Problem Track		15
Includes 3 credit hours for HMS 636 and 12 elective credit hours		
HMS 636	Research Problems in Health, Physical Education, Recreation and Sports	
Electives 9		
HMS 680	Problems in Health Education	
HE 581	Teaching Sexuality Education in Schools	
HMS 605	Principles of Movement Analysis in Team Sports for Physical Education	
HMS 607	Principles of Movement Analysis in Individual Sports for Physical Education	
HMS 609	Principles of Movement Analysis in Dance and Rhythmic Activities for Physical Education	
TLED 608	Foundations of Education and Instructional Assessment	
READ 680	Reading to Learn Across the Curriculum	
Total Hours		60

* All students must complete 9 hours of electives chosen from the list of electives or substituted from relevant courses in ECI, ELS, or ESSE, with permission of the advisor.

Physical Education Emphasis in Coaching Education

This emphasis will offer additional theories and knowledge in the coaching profession providing advanced skills to those individuals pursuing a coaching career. The courses selected for the Coaching Education emphasis area will meet accreditation standards, certify students as athletic coaches, and provide valuable knowledge and skills.

Stephen Knott
2030 Student Recreation Center
757-683-3355

Admission and Entrance Requirements

1. Students applying for admission with regular status must have:
2. a bachelor's degree from an accredited institution with a cumulative undergraduate grade point average (GPA) of 2.80 and a GPA of 3.00 in the undergraduate major courses;
3. a score of at least 291 (900 by former scoring standard) in the quantitative and verbal portions of the Graduate Record Examination (GRE) - GRE scores are required for consideration of admission for all candidates; (In some circumstances, students who have either a low GPA or a low GRE score may be considered for admission with provisional status);

4. demonstrated computer literacy.

Continuance and Exit Requirements

Students must meet all requirements for continuance as outlined in the graduate continuance policy for the University. Students completing the program of study must:

1. achieve an overall GPA of 3.0 and a GPA of 3.0 in the major courses;
2. demonstrate writing proficiency;
3. satisfy all course competencies;
4. pass a comprehensive examination when required;
5. complete an internship, research project, or thesis as a culminating experience;
6. hold an exit interview with the program coordinator; and
7. file the necessary paperwork for graduation and teacher licensure.

Prerequisites		10
BIOL 250	Human Anatomy and Physiology I	
EXSC 322	Anatomical Kinesiology	
PE 409	Physiology of Exercise	
Research Core		6
FOUN 612	Applied Research Methods in Education	
FOUN 722	Introduction to Applied Statistics and Data Analysis	
Core Courses		15
HMS 718	Applied Coaching Theory	
HMS 719	Organization and Administration in Coaching	
HMS 740	Principles and Concepts of Motor Learning	
HMS 721	Motivational Issues in Sports	
HMS 745	Assessment and Evaluation in Physical Education	
Internship 3-6 Credits*		3-6
HMS 667	Internship in Health, Physical Education, Recreation and Sports	
Electives 6-9 Credits		6-9
HMS 739	Current Research in Motor Development	
PE 409	Physiology of Exercise	
EXSC 508	Nutrition for Fitness and Sport	
HMS 605	Principles of Movement Analysis in Team Sports for Physical Education	
AT 711	Analysis of Human Motion for Sports Medicine Clinicians	
HMS 607	Principles of Movement Analysis in Individual Sports for Physical Education	
HMS 606	Planning and Administration of an Effective Health and Physical Education Program	
HMS 720	Curriculum Development in Physical Education	
*The hours for the internship and electives are variable depending on the student's interest for elective options and availability of internship opportunities.		
Total Hours		40-46

Physical Education Curriculum and Instruction with Initial Virginia Licensure in Physical Education and Health Education

Stephen Knott
2030 Student Recreation Center
757-683-3355

Admission and Entrance Requirements

Students applying for admission with regular status must have:

1. a bachelor's degree from an accredited institution with a cumulative undergraduate grade point average (GPA) of 2.80 and a GPA of 3.00 in the undergraduate major courses;
2. a score of at least 291 (900 by former scoring standard) in the quantitative and verbal portions of the Graduate Record Examination (GRE) - GRE scores are required for consideration of admission for all candidates;
3. a composite score of 532 on the PRAXIS I (PPST in reading, writing, and mathematics) or State Board approved equivalent SAT or ACT score for admission to the program and acceptance into teacher education; and
4. demonstrated computer literacy.

(In some circumstances, students who have either a low GPA or a low GRE score may be considered for admission with provisional status)

Continuance and Exit Requirements

Students must meet all requirements for continuance as outlined in the graduate continuance policy for the University. Students completing the program of study must:

1. achieve an overall GPA of 3.0 and a GPA of 3.0 in the major courses;
2. demonstrate writing proficiency;
3. satisfy all course competencies;
4. pass a comprehensive examination when required;
5. complete an internship, research project, or thesis as a culminating experience;
6. hold an exit interview with the program coordinator; and
7. file the necessary paperwork for graduation and teacher licensure.

Curriculum

Specific requirements for the program are as follows (36 total credits with additional credits up to 54 as needed to satisfy Virginia licensure requirements):

Prerequisites

Select one of the following: 4

BIOL 105N Biology for Nonscience Majors I

BIOL 121N General Biology I
& BIOL 122N and General Biology I Lab

BIOL 250 Human Anatomy and Physiology I

EXSC 322 Anatomical Kinesiology

Required Courses

Human Growth and Development 3

HMS 739 Current Research in Motor Development
or HMS 740 Principles and Concepts of Motor Learning

Curriculum and Instruction 7

HMS 720 Curriculum Development in Physical Education

PE 504 Adapted Physical Education

Foundations in Education 3

TLED 608 Foundations of Education and Instructional Assessment

Reading in the Content Area 3

READ 680 Reading to Learn Across the Curriculum

Supervised Classroom Experiences 7

HPE 587 Teacher Candidate Seminar

HMS 667 Internship in Health, Physical Education, Recreation and Sports

Human Anatomy, Physiology & Kinesiology 3

Health & Physical Education Theory, Planning, Administration, and Assessment 6

PE 409	Physiology of Exercise	
HMS 606	Planning and Administration of an Effective Health and Physical Education Program	
HMS 745	Assessment and Evaluation in Physical Education	
Physical Education Methodology Courses (Team, Adaptive, Individual and Dance)		9
HMS 605	Principles of Movement Analysis in Team Sports for Physical Education	
HMS 607	Principles of Movement Analysis in Individual Sports for Physical Education	
HMS 609	Principles of Movement Analysis in Dance and Rhythmic Activities for Physical Education	
Health Methods		6
HPE 530	Teaching Wellness and Health-Related Fitness	
HE 502	Methods and Materials in Health Education	
Research - Program Requirement		3
FOUN 612	Applied Research Methods in Education	
The following Driver's Education Endorsement courses are strongly advised for any candidate wishing to teach at the secondary level		6
PE 308	Driver Education Foundations of Traffic Safety	
PE 309	Principles and Methodologies of Classroom and In-Car Instruction	
Total Hours		60

Exercise Science and Wellness Emphasis

David Swain, Graduate Coordinator
2024 Student Recreation Center
757-683-6028

This emphasis is designed for the student who desires to pursue advanced study in the science of exercise and health promotion. The course work will help to strengthen the background of those individuals already involved in conducting fitness programs for various age groups or to prepare individuals for careers in other health-related fields that utilize exercise as preventive medicine.

Admission and Entrance Requirements

Students applying for admission with regular status must have:

1. a bachelor's degree from an accredited institution with a cumulative undergraduate GPA of 2.8 and a GPA of 3.0 in the undergraduate major courses; and
2. have a score of at least 291 (900 by former scoring standard) between quantitative and verbal on the Graduate Record Examination (GRE).

Students who have either a low GPA or a low GRE score may be considered for admission to provisional status. GRE scores are required for consideration of admittance. Additionally, students must be computer literate. Prerequisites include two semesters of anatomy and physiology, one semester of exercise physiology, and one semester of biomechanics.

Continuance and Exit Requirements

Students must meet all requirements for continuance as outlined in the graduate continuance policy for the University. Students completing the program of study must:

1. have an overall grade point average of 3.0;
2. have a grade point average of 3.0 in the major;
3. demonstrate writing proficiency;
4. satisfy all course competencies;
5. pass a comprehensive examination;

- complete an internship or research project/thesis;
- have an exit interview with the program director; and
- file the necessary paperwork for graduation.

Curriculum

Core Courses	18
EXSC 528	Exercise Prescription for Chronic Disease
HMS 630	Exercise Physiology
HMS 642	Clinical Exercise Testing and Prescription
HMS 661	Seminar in Nutrition for Sports and Health
HMS 727	Advanced Biomechanics
HMS 730	Advanced Cardiovascular Exercise Physiology
Research Core	6
FOUN 612	Applied Research Methods in Education
FOUN 722	Introduction to Applied Statistics and Data Analysis
Requirements for different tracks are as follows	12
Thesis Track	
Includes 6 credit hours for Thesis and 6 credit hours for electives.	
HMS 698	Thesis
HMS 699	Thesis
Electives	
Research-Problem Track	
Includes 3 credit hours for HMS 636 and 9 credit hours for electives	
HMS 636	Research Problems in Health, Physical Education, Recreation and Sports
Electives	
Non-Research Track	
Includes 6 credit hours for ESPR 667 and 6 credit hours of HMS electives	
HMS 667	Internship in Health, Physical Education, Recreation and Sports
HMS Electives	
Total Hours	36

Supportive electives may be chosen from a restricted list of courses in health, physical education and recreation, sports management, biology, or other areas of relevant study. The student will also select either a research or internship option.

Sport Management Emphasis

Stephen Shapiro, Graduate Coordinator
2012 Student Recreation Center
757-683-5078

The emphasis is designed to prepare students for roles in sport management and administration. Students enrolled in the program can pursue a number of sport career paths including college athletic administration, professional sport marketing and promotions, sport facility management, sport event management, recreational sports management and supervision, health club and fitness management, amateur sport organization administration, etc.

Admission and Entrance Requirements

Students applying for admission with regular status must have:

- a bachelor's degree from an accredited institution with a cumulative undergraduate GPA of 2.8 and a GPA of 3.00 in the undergraduate major courses; and
- have a score of at least 291 (900 by former scoring standard) between quantitative and verbal on the Graduate Record Examination (GRE) or a score of at least 400 on the GMAT or 400 on the MAT.

Students who have either a low GPA or a low GRE score may be considered for admission to provisional status. Additionally, students must be computer literate.

Continuance and Exit Requirements

Students must meet all requirements for continuance as outlined in the graduate continuance policy for the University. Students completing the program of study must:

- have an overall grade point average of 3.0;
- a grade point average of 3.0 in the major;
- demonstrate writing proficiency;
- satisfy all course competencies;
- pass a comprehensive examination;
- complete an internship or research project/thesis;
- have an exit interview with the program director; and
- file the necessary paperwork for graduation.

Curriculum

Core Courses (*required)	24
SRM 711	Theory and Application in Sport and Recreation
SRM 738	Fiscal Planning and Management in Sport and Recreation *
SRM 746	Sport and Recreation Marketing *
SRM 750	Ethics in Sport and Recreation Management
SRM 752	Facility Management for Sport and Recreation
SRM 753	Sponsorship and Event Planning
SRM 755	Social Issues in Sport and Recreation
SRM 760	Legal Aspects of Sport and Recreation *
SRM 775	Management and Leadership in Sport and Recreation *
SRM 780	Youth Development in Sport and Recreation
Research Core	6
FOUN 611	Introduction to Research Methods in Education
or FOUN 612	Applied Research Methods in Education
FOUN 722	Introduction to Applied Statistics and Data Analysis
Requirements for the different tracks are as follows	6
Thesis Track	
HMS 698	Thesis
HMS 699	Thesis
Research-Problem Track	
HMS 636	Research Problems in Health, Physical Education, Recreation and Sports
Electives	
Non-Research Track	
SRM 764	Field Experience in Sport and Recreation Management
Total Hours	36

Doctor of Philosophy in Education – Human Movement Sciences Concentration

David Swain, Graduate Program Director
2024 Student Recreation Center
757-683-2024

The goal of our doctoral program is to prepare professionals with research knowledge, critical thinking skills and problem solving abilities required to be successful leaders, scholars, and educators. The program provides a

solid theoretical foundation, advanced methodological training, one-on-one mentorship, and opportunities to teach undergraduate courses.

We offer a Ph.D. in Education with a concentration in Human Movement Sciences. There are two emphasis areas within the HMS concentration. These include:

Applied Kinesiology – this area focuses on Exercise Physiology and Biomechanics and prepares graduates for positions as post-doctoral research fellows, university faculty, and/or governmental research officials.

Sport and Recreation Management – this area focuses on issues related to the administration of sport and recreation organizations. Graduates are prepared for careers as faculty or administrators in higher education, private organizations, public agencies, and/or other research-based institutions.

Admission and Entrance Requirements

Admission to the Human Movement Sciences concentration of the Ph.D. in Education is competitive and meeting the minimum requirements does not ensure admission to the program. The admissions committee reviews applications and considers a number of criteria, including a goodness of fit between student and faculty.

The deadline for applying is January 15. Applicants may be contacted to set up an interview as part of the final selection process.

Individuals interested in applying for the doctoral program with a concentration in Human Movement Sciences must submit the following:

- An application to the University. Contact the Office of Graduate Admissions for applications. Applications for graduate study can be completed online or submitted to the Office of Graduate Admissions (757-683-3685). Apply for the Ph.D. Human Movement Sciences Concentration.
- Official transcripts of all undergraduate and graduate courses and degrees completed. To be considered for the program, applicants must have completed a Bachelor's and a Master's degree from regionally accredited colleges/universities. At least one degree should be in a related discipline to the emphasis area. A minimum GPA of 3.5 (on a 4.0 scale) for the Master's degree is required.
- Two writing samples. The first writing sample should be a research-based document that includes citations and a list of references. This could be a submitted manuscript or published article, a summary of your thesis, or a research paper from a graduate course. The second writing sample should be a personal statement that explains your qualifications, professional and career goals, and reasons for seeking the Ph.D. In this second essay, you must also identify the potential professor(s) at ODU with whom you share common research interests.
- A current copy of your resume or Curriculum Vitae.
- Three letters of recommendation from professional sources qualified to assess your suitability for study at the doctoral level. One letter of recommendation should be from a graduate advisor or faculty member and one should be from a current or former supervisor.
- Official GRE scores taken within the last 5 years that indicate a total score of at least 297 (1000 by former scoring standard) for both the verbal reasoning and quantitative reasoning sections and a minimum of 4.5 on the analytical writing component. While these scores are recommended, other portions of the total application package will be considered. The Sport and Recreation Management emphasis area will also accept GMAT scores of 470 or higher.
- Applicants whose native language is not English must also submit current scores for the Test of English as a Foreign Language (TOEFL) of at least 550.

After successful advancement to candidacy, all doctoral students are required to be registered for at least one graduate credit hour each term (fall, spring, and summer) until the degree is completed, including the semester in which they graduate. Failure to comply with this requirement will result in charges to the student's account for one graduate credit hour plus required fees for each semester after passing the candidacy examination. Students are not eligible for graduation until all charges are paid.

Continuance and Exit Requirements

Students completing the program of study must:

- Have an overall grade point average of 3.0 or higher
- Satisfy all course competencies
- Pass comprehensive examinations
- Complete a dissertation
- Have an exit interview with the program director
- File the necessary paperwork for graduation

Curriculum - Applied Kinesiology

Joshua Weinhandl

1003 Student Recreation Center

757-683-4754

Requirements for the emphasis are as follows (minimum of 60 credits):

Prerequisite Courses

Prerequisite Coursework *		
FOUN 612	Applied Research Methods in Education	
FOUN 722	Introduction to Applied Statistics and Data Analysis	
Research Core		12
FOUN 812	Research Design and Analysis	
FOUN 814	Qualitative Research Design in Education	
FOUN 822	Applied Linear Models in Educational Research	
FOUN 823	Analysis of Variance Applied to Educational Research	
Professional Preparation		6
HMS 890	Doctoral Studies Seminar	
FOUN 881	Dissertation Seminar	
TLCI 803	Perspectives and Inquiry in Curriculum and Instruction	
TLCI 804	Instruction Theories and Models	
Applied Kinesiology Emphasis		21
HMS 827	Advanced Biomechanics	
HMS 830	Advanced Cardiovascular Exercise Physiology	
HMS 838	Exercise Endocrinology	
HMS 897	Readings and Research in Content Area	
Electives **		9
BIMD 815	Human Physiology I	
BIMD 816	Human Physiology II	
BIMD 856	Advanced Cardiovascular Sciences	
BIMD 871	Advanced Endocrinology	
BME 821	Quantitative Analysis of Human Physiological Systems I	
BME 822	Quantitative Analysis of Human Physiological Systems II	
BIOL 816	Endocrinology	
BIOL 824	Neuromuscular Physiology	
BIOL 889	Gross Anatomy	
Dissertation Capstone Courses		12
HMS 899	Dissertation	
Total Hours		60

+ A master's degree in an appropriate field related to this concentration is required for regular admission to the Ph.D. in human movement science.

- * Students who do not have equivalent coursework or appropriate educational experiences must complete these prerequisite courses.
- ** Substitute other courses by permission of advisor.

Curriculum - Sport and Recreation Management

Eddie Hill

2019 Student Recreation Center
757-683-4881

Requirements for the emphasis are as follows (minimum of 60 credits)

Prerequisite Courses

FOUN 612	Applied Research Methods in Education
FOUN 722	Introduction to Applied Statistics and Data Analysis

Research Core 12

FOUN 812	Research Design and Analysis
FOUN 814	Qualitative Research Design in Education
FOUN 822	Applied Linear Models in Educational Research
FOUN 823	Analysis of Variance Applied to Educational Research

Professional Preparation (9 credits minimum) 9

HMS 890	Doctoral Studies Seminar
FOUN 881	Dissertation Seminar
TLCI 803	Perspectives and Inquiry in Curriculum and Instruction
TLCI 804	Instruction Theories and Models
FOUN 830	Theories of Learning and Instruction

Sport and Recreation Management Emphasis (18 credits minimum) 18

SRM 811	Theory and Application in Sport and Recreation
SRM 838	Fiscal Planning and Management in Sport and Recreation
SRM 846	Sport and Recreation Marketing
SRM 850	Ethics in Sport and Recreation Management
SRM 853	Sponsorship and Event Planning
SRM 855	Social Issues in Sport and Recreation
SRM 860	Legal Aspects of Sport and Recreation
SRM 875	Management and Leadership in Sport and Recreation
SRM 880	Youth Development in Sport and Recreation

Electives (9 credits minimum) 9

Options for SRM Course Substitutions and Electives

ELS 815	Leadership for Equity and Inclusive Education
ELS 876	Leadership for Social Justice
HIED 808	Contemporary Issues in Higher Education
HIED 894	Organization and Administration of Higher Education in the United States
PAUP 808	Intellectual Foundations of Public Administration
PAUP 811	Urban Services Administration
PAUP 814	Public-Private Partnerships
PAUP 820	Public Personnel Administration
PAUP 830	Theories of Conflict Resolution and Problem Solving
PAUP 845	Managing Development and Change in Public Organizations
PAUP 895	Advanced Topics in Public Personnel Administration

MKTG 801	Seminar in Marketing Theory: History and Current Topics
MKTG 802	Seminar in Marketing Concepts and Issues
MKTG 803	Seminar in Consumer Behavior
MGMT 840	Strategy Classics
MGMT 835	Organization Theory
HMS 897	Readings and Research in Content Area
Dissertation Capstone Courses	
HMS 899	Dissertation
Total Hours	
60	

Department of Science, Technology, Engineering, and Mathematics (STEM) Education and Professional Studies

228 Education Building
757-683-4305

Robert Spina, Interim Chair

The Department of Science, Technology, Engineering and Mathematics (STEM) Education and Professional Studies (STEMPS) is an academic leader in graduate studies related to education specialists, including career and technical education, instructional design and technology, marketing education, science education, mathematics education, technology education, STEM education, community college teaching, and business and industry training. It offers the M.S., M.S.Ed, and the Ph.D. in Education with programs in occupational and technical studies (OTS) and instructional design and technology (IDT). The Ed.S. is offered in conjunction with the educational leadership program. The department also offers licensure and teaching endorsement programs. Due to changing University requirements, national accreditation standards, and Commonwealth licensure regulations, the programs in the Darden College of Education are under constant revision. Any changes resulting from these factors supersede the program requirements described in the catalog. Students should obtain current program information from their advisors and the Darden College of Education website at <http://education.odu.edu/>.

Individual programs are described on the following pages.

Instructional Design and Technology Programs

- Master of Science in Education - Elementary – Instructional Design and Technology
- Master of Science in Education - Secondary – Instructional Design and Technology
- Doctor of Philosophy in Education- Instructional Design and Technology
- Certificate in Education and Training in Modeling and Simulation

Mathematics and Science Education Programs

- Master of Science in Education with Mathematics Education Specialist Endorsement (PK-8)
- Master of Science in Education with Initial Licensure 6-12 - Mathematics
- Mathematics Education Specialist Endorsement (PK-8)
- Master of Science in Education with Initial Licensure - Secondary - Science
- Master of Science in Education for Licensed Teachers - Elementary – Science
- Master of Science in Education for Licensed Teachers - Secondary – Science

Occupational and Technical Studies Programs

- Master of Science, Occupational and Technical Studies Program, with concentrations in:

- Business and Industry Training
- Career and Technical Education
- Community College Teaching
- STEM Education
- Master of Science, Occupational and Technical Studies, Technology Education concentration with Licensure
- Endorsement Program in Industrial Cooperative Training
- Marketing Teacher Education with Licensure
- Education Specialist
- Doctor of Philosophy in Education-Occupational and Technical Studies Concentration

Master of Science in Education - Elementary – Instructional Design and Technology Concentration

Ginger Watson, Program Coordinator

In the Master of Science in Education – Elementary-- instructional design and technology concentration, the core and support courses are combined, with students selecting 24 to 30 credits in instructional design and technology along with the problem paper or seminar research option. Working with an assigned advisor, students may take courses in the areas of distance education/telecommunications, instructional design and development, educational applications of instructional technology, and administration of instructional technology.

Admission

Students must:

1. hold a bachelor's degree from a regionally accredited college/university;
2. have a cumulative undergraduate grade point average of 2.80;
3. take and receive satisfactory scores on either the Graduate Record Examination (score of 290 combined on verbal and quantitative with a minimum of 140 verbal for regular admission) or Miller Analogies Test (minimum score of 45 or 399 for regular admission); and
4. have an interview with the graduate program director or his/her designee.

Performance in classes taken as a non-degree graduate student will not be taken into consideration in the admission process. No courses in the undergraduate academic major or professional education in which the student has made below a C- will be accepted for licensure in the Darden College of Education.

Under certain circumstances, applicants who do not fully meet the requirements for regular admission to the program may be admitted on a provisional basis subject to conditions specified by the graduate program director for elementary/middle education.

Continuance

Students must:

1. maintain a grade point average of 3.00;
2. maintain a grade point average of 3.00 in the major.

All ID&T students are expected to have regular and reliable access to a multimedia computer (headphones, microphone, and web cam) and a high speed Internet connection.

Exit

Students must:

1. have a 3.00 grade point average;
2. pass a written comprehensive examination;
3. have an exit interview;
4. have completed all course requirements; and
5. submit an application for graduation.

Program Requirements

All courses in the core and elective blocks are offered via synchronous and asynchronous format.

Paper Option: Area I (24 credits); Area II (6 credits); 30 credits total.

Seminar Option: Area I (30 credits); Area II (6 credits); 36 credits total.

Core Courses * 24-30

IDT 715	Management of Technology Resources in the Classroom
FOUN 840	Educational Measurement and Assessment
IDT 746	Foundations of Distance Education
IDT 749	Instructional Systems Design
IDT 761	Applied Instructional Design
IDT 775	Designing Online Instruction
TLED 430/530	PK-12 Instructional Technology
TLED 665	Digital Video Materials Development
TLCI 731	Instructional Technology Trends in Curriculum and Instruction

Support Courses

Graduate electives approved by the Graduate Program Director may be substituted for technology courses when those courses complement personal and professional goals.

Research Courses 6-12

Problem Paper Option (6 credits; 30 credits required for graduation)

FOUN 612	Applied Research Methods in Education
SEPS 636	Problems in Occupational and Technical Studies

Seminar Option (13 credits; 37 credits required for graduation)

FOUN 612	Applied Research Methods in Education
IDT 773	Advanced Instructional Design Techniques

Electives

Total Hours 30-42

Master of Science in Education - Secondary – Instructional Design and Technology Concentration

Ginger Watson, Program Coordinator

The Master of Science in Education – Secondary - instructional design and technology concentration is designed to meet the needs of professionals interested or involved in the design, development, and delivery of instruction. The courses are appropriate for a variety of venues, including preK-12, higher education, military, and business. In this specialization, student's select 24 to 30 credits in instructional design and technology plus the problems paper or seminar research option. Working with an advisor, students select courses that complement their backgrounds and professional goals.

Admission

Students must:

1. hold a bachelor's degree from a regionally accredited college/university;
2. have a cumulative undergraduate grade point average of 2.80;
3. take and receive satisfactory scores on either the Graduate Record Examination (score of 290 combined on verbal and quantitative with a minimum of 140 verbal for regular admission) or Miller Analogies Test (minimum score of 45 or 399 for regular admission); and
4. have an interview with the graduate program director or his/her designee.

Performance in classes taken as a non-degree graduate student will not be taken into consideration in the admission process.

Continuance

Students must:

1. maintain a grade point average of 3.00;
2. maintain a grade point average of 3.00 in the major.

All ID&T students are expected to have regular and reliable access to a multimedia computer (headphones, microphone, and web cam) and a high speed Internet connection.

Exit

Students must:

1. have a 3.00 grade point average;
2. pass a written comprehensive examination;
3. have an exit interview;
4. have completed all course requirements; and
5. submit an application for graduation.

Program Requirements

All courses in the core and elective blocks are offered via synchronous and asynchronous format.

Area I: Emphasis Courses		
Introductory Courses		6
IDT 617	Foundations of Instructional Technology (*)	
IDT 749	Instructional Systems Design	
Elective Courses *		18-24
Theory (Select at least one course)		
IDT 746	Foundations of Distance Education	
IDT 760	Cognition and Instructional Design	
IDT 763	Instructional Design Theory	
IDT 764	Theories and Research	
Design (Select at least three courses)		
IDT 725	Human Performance Assessment	
IDT 742	Task Analysis Methods	
IDT 748	Instructional Technology Product Evaluation	
IDT 761	Applied Instructional Design	
IDT 773	Advanced Instructional Design Techniques	
Technology (Select at least one course)		
IDT 735	Knowledge Management	
IDT 751	Computer-Based Multi-Media Design	
IDT 752	Diffusion and Adoption of Instructional Technology Innovations	
IDT 755	Theory and Design of Instructional Simulation	
IDT 756	Instructional Gaming: Theories and Practice	
IDT 775	Designing Online Instruction	
Human Performance Technology (Select at least one course)		
IDT 730	Principals and Practice of Human Performance Technology	
IDT 737	Consulting Skills for Instructional Designers	
IDT 739	Needs Analysis and Assessment	
Electives: From above, or from related areas (e.g., Modeling & Simulation, Psychology, Engineering, Speech-communications, Business, I/O Psychology) with approval of advisor and GPD		
Area II: Research Core Courses Required		
Problem Paper Option		6
FOUN 612	Applied Research Methods in Education	
SEPS 636	Problems in Occupational and Technical Studies	

* = Required Course

Total Hours

30-36

Doctor of Philosophy in Education – Instructional Design and Technology Concentration

Gary Morrison, Program Coordinator

The Doctor of Philosophy in Education Instructional Design and Technology (ID&T) concentration prepares individuals to conduct research and assume leadership roles in the field of instructional technology. Students will master a number of instructional design skills, ranging from instructional problem identification, task and audience analysis, strategy design, assessment, evaluation, and implementation that they can use in a variety of settings including traditional classrooms, distance education, business, health care, military, K-12 and higher education, and government. Courses explore theories and research that provide a foundation for the field. Students are also expected to participate in and conduct research studies as part of their program. Completing the Ph.D. in ID&T will prepare students to take jobs as instructional design and human performance practitioners in business, military, government, health care, and educational settings. They are also prepared to take positions as faculty members in higher education and as researchers for private organizations.

Admission

For admission to this program, individuals should have completed master's degree in an appropriate discipline from a regionally accredited university. Degrees that are equivalent to a master's degree such as L.L.B., J.D., and D.D.S. are also acceptable. Prospective students should also have prior course work in statistics and instructional technology. If this requirement is not met, then additional course work may be added to the candidate's graduate program of study at the discretion of the advisor and graduate program director. Please see prerequisites on the curriculum description for specifics.

Admission to the instructional design and technology Ph.D. program is competitive. A number of criteria are considered including graduate and undergraduate GPAs, GRE scores, writing ability, a personal interview, and the match between student interests and faculty expertise. Meeting the minimum requirements established by the department does not ensure admission to the program. A minimum undergraduate GPA of 2.8 and a minimum graduate GPA of 3.25 are recommended.

Application requirements for the Ph.D. in instructional design and technology are as follows:

1. a completed application which is available online or from the Office of Graduate Admissions.
2. Official transcripts of all undergraduate and graduate courses and degrees completed.
3. Official report scores from the Graduate Record Examination (verbal, quantitative, and analytical) taken within the last five years. GRE scores expire after five years; however, candidates who have completed the exam prior to five years before the application deadline may submit those scores for consideration if they are provided from an official source such as a transcript or form provided by the Educational Testing Service. Old Dominion University reserves the right to determine what is an "official source."
4. Applicants whose native language is not English (or who do not have a B.S. or M.S. degree from an accredited institution in a country where English is the native language) must submit a current score for the Test of English as a Foreign Language (TOEFL) of at least 600 (written) or 250 (computer based).
5. Applicants must submit a 500 word statement of their academic and professional goals with an emphasis on how the Ph.D. degree in instructional design and technology will contribute to the achievement of the stated goals.
6. Three letters of reference from sources capable of commenting on the applicant's readiness for advanced graduate study. It is recommended

that at least two of the letters come from university faculty members. Other letters may come from work supervisors or managers.

- An interview with the instructional design and technology program faculty. This committee will also review applications for admission.

Program Requirements

The Ph.D. program in Education with a concentration in instructional design and technology is comprised of courses totaling a minimum of 60 academic credit hours beyond the master's degree. The curriculum includes an program core of 21 credit hours, 9 credit hours in the instructional design concentration, and a research core of 15 credit hours, the three credit dissertation seminar and the dissertation, which will include a minimum of 12 credit hours. The dissertation will often include more than 12 credit hours depending on the length of time necessary for completion. Students entering the program may also need to complete introductory statistics courses and an instructional technology foundations course if they have not had equivalent courses or cannot demonstrate competency at a satisfactory level. Students who enter the Ph.D. program with a master's degree in an academic field that is unrelated to instructional design and technology and/or who have not completed courses to develop competency in specified areas may need to complete these courses in addition to the required courses. All courses are offered through distance learning. All students must complete the research residency project (IDT 879 and IDT 898) that results in a submission for publication or presentation to a nationally refereed journal or conference prior to taking comprehensive exams. The residency project must be completed within two years of the start of IDT 879. If not, the student must repeat IDT 879 without credit.

All IDT students are expected to have regular and reliable access to a multimedia computer (headphones, microphone, and web cam) and a high speed Internet connection.

Under normal circumstances, admissions will be offered at least three times a year for the fall, spring, and summer semesters. Acceptance is competitive to assure that there is an adequate number of full-time faculty to serve the students through advising, mentoring, and other duties, particularly when individuals reach the dissertation stage of the program.

Students interested in attending full-time and applying for financial aid should submit their applications by February 1 prior to the fall semester they wish to start.

Applicants must submit completed applications and all related material no later than the following dates:

- May 1st for the Fall Semester*
- November 1st for the Spring Semester
- March 1st for the Summer Semester

Program Continuance

After completing 12 hours in ID&T course work, students must maintain a 3.25 GPA in ID&T courses. Failure to do so will result in one year probation. If the student's GPA in ID&T courses is less than 3.25 at the end of the probation period, the student will be suspended. Students who earn a grade of C+ or lower (including U) in a graduate course in their program of study are considered to be making unsatisfactory progress. Students earning one or more grades of C+ or lower must meet with the program director prior to enrolling in courses in future semesters. Students must provide a plan for making satisfactory progress or they will be suspended. If a student earns three or more grades of C+ or lower, they will be suspended from the program. Students wishing to be considered for reinstatement must follow the procedures set forth in the ODU Graduate Catalog.

In addition, the ODU Graduate Catalog states students who have less than a 3.0 GPA on courses at ODU will be placed on probation and may be suspended if conditions prescribed in the catalog are not met.

Continuous Enrollment and Exams

Doctoral students who do not meet the conditions for continuous enrollment and who do not have an approved leave of absence will be suspended from the degree program. Doctoral students who fail the comprehensive exam

(either oral or written) or the doctoral final examination (e.g., dissertation defense) twice will be suspended from the degree program.

Satisfactory Progress

Doctoral students who do not complete at least 12 hours of course credits towards their degree each year with a grade of B- or higher prior to candidacy will be evaluated for continuation in the program. If the program faculty do not feel the student is making adequate progress, the student will be placed on program probation for one year. If the student has not completed 12 hours of course credits toward the degree with a grade of B- or higher, they will be suspended.

Research Residency and Dissertation

Doctoral students will be evaluated annually for their progress in completing their research residency or dissertation. Students who have not made progress towards the completion as demonstrated evidence of a finished proposal, data collection, data analysis, or drafts of the manuscript/ dissertation will be evaluated by faculty for continuance in the program. If faculty feel the student has not made adequate progress, the student will be placed on probation for one year. If the student has not made adequate progress after one year of probation, faculty may recommend suspension from the program for failing to make adequate progress towards completion of the degree.

Plagiarism

Any student found guilty of plagiarism will be suspended immediately from the program.

Program Completion and Exit

To complete the program students must fully comply with the curriculum below and all requirements noted elsewhere in the University catalog for graduate students and within the Ph.D. in Education Handbook. It is the responsibility of the student to obtain these materials and complete required portions.

Curriculum

Prerequisites: All students admitted into the Ph.D. in instructional design and technology must complete the following prerequisite courses unless they have previously completed equivalent graduate level coursework or have appropriate educational experience.

Prerequisites *

FOUN 722	Introduction to Applied Statistics and Data Analysis	
IDT 617	Foundations of Instructional Technology	
ID&T Core Courses		21
IDT 730/830	Principals and Practice of Human Performance Technology	
IDT 751/851	Computer-Based Multi-Media Design	
IDT 760/860	Cognition and Instructional Design	
IDT 773/873	Advanced Instructional Design Techniques	
IDT 801	Instructional Design and Technology Seminar	
IDT 810	Trends and Issues in Instructional Design and Technology	
IDT 849	Instructional Systems Design	
Research Core		15
FOUN 812	Research Design and Analysis	
FOUN 814	Qualitative Research Design in Education	
FOUN 823	Analysis of Variance Applied to Educational Research	
IDT 725/825	Human Performance Assessment	
IDT 879	Research Residency in Instructional Design and Technology	
Instructional Design Concentration		9

Choose courses from the following:

Design & Theory	
IDT 742/842	Task Analysis Methods
IDT 746/846	Foundations of Distance Education
IDT 748/848	Instructional Technology Product Evaluation
IDT 761/861	Applied Instructional Design
IDT 763	Instructional Design Theory (IDT 863)
IDT 764/864	Theories and Research
IDT 898	Research Residency II
Technology	
IDT 715/815	Management of Technology Resources in the Classroom
IDT 752/852	Diffusion and Adoption of Instructional Technology Innovations
IDT 755/855	Theory and Design of Instructional Simulation
IDT 756/856	Instructional Gaming: Theories and Practice
IDT 775/875	Designing Online Instruction
TLCI 735/835	Connecting Research In Early Developmental Practice in Early Childhood Education
Human Performance Technology	
IDT 735/835	Knowledge Management
IDT 737/837	Consulting Skills for Instructional Designers
IDT 739/839	Needs Analysis and Assessment
Electives **	
Capstone Courses	
FOUN 881	Dissertation Seminar ***
SEPS 899	Dissertation in Occupational Education
Total Hours	45

* All students admitted into the Ph.D. program in instructional design and technology must complete the prerequisite courses unless they have previously completed equivalent graduate level coursework or have appropriate educational experience.

** Electives are chosen from the list above, or from related areas, e.g., modeling & simulation, psychology, engineering, speech-communications, business, IO psychology.

*** If seminar is waived by the doctoral committee, the credits are added to the content.

Additional courses or substitutions may be used as approved by student's advisory committee.

Education and Training Emphasis in Modeling & Simulation Certificate

Ginger Watson, Program Coordinator

The College of Education offers a certificate in Modeling & Simulation through the Instructional Design and Technology program, a graduate-level program that is part of the STEM Education and Professional Studies Department.

Simulation and gaming are used extensively as teaching tools and training environments in a variety of education and training applications. The certificate provides the student with a fundamental understanding of modeling and simulation techniques coupled with targeted coursework in the design and use of simulation and gaming technologies for instructional settings. This certificate was the first of its kind in the U.S. and is a natural concentration area in instructional design and technology given the widespread use of simulation and gaming as instructional tools in Pre-K-12 education, colleges, universities, and corporate and military training programs. This certificate is one of several such certificate programs offered as part of the M&S strategic plan of Virginia Modeling, Analysis and Simulation Center (VMASC) and ODU.

The Modeling and Simulation Certificate Program consists of a minimum of four, three credit graduate courses. Courses include:

Core Courses	3
MSIM 601	Introduction to Modeling and Simulation
Related Elective Courses	9
IDT 755/855	Theory and Design of Instructional Simulation
IDT 756/856	Instructional Gaming: Theories and Practice
SEPS 750/850	Trends and Issues in Training: Modeling and Simulation
Total Hours	12

For more information about the Master of Science in Engineering modeling and simulation concentration, refer to the Catalog section for the Batten College of Engineering and Technology.

Master of Science in Education - Elementary - with Mathematics Education Specialist Endorsement (PK-8)

Mary Enderson, Program Coordinator

This graduate program leads to a Master's of Science in Education degree. Elementary major, with the Mathematics Specialist (PK-8) endorsement. This program is offered in partnership with the Department of Mathematics and Statistics in the College of Sciences.

Admission

Candidates must:

- Have 3 years of successful classroom experience in teaching mathematics;
- Hold a bachelor's degree from a regionally accredited college/university;
- Hold the Virginia Collegiate Professional License or an equivalent license from another state.
- Have an undergraduate grade point average of 2.80 and an average of 3.00 in the major;
- Achieve a satisfactory score (as established by the Department of Educational Curriculum and Instruction) on the Graduate Record Examination or the Miller Analogies Test; and
- Submit an application for graduate studies.

Performance in classes taken as a non-degree student will not be taken into consideration in the admission process. Under certain circumstances, applicants who do not fully meet the requirements for regular admission to the program may be admitted on a provisional basis subject to conditions specified by the graduate director for the program.

Continuance

Candidates must maintain a grade point average of 3.00.

Exit

Candidates must:

- Have a 3.00 grade point average;
- Have completed all course requirements;
- Have completed a professional learning portfolio; and
- Submit an application for graduation.

Curriculum

A minimum of 33 semester credits are required. The courses for completion of the degree program are listed below:

Education Content	15
STEM 651	Differentiation of Mathematics Instruction for Diverse Student Populations

STEM 660	Action Research for Mathematics Specialists	
STEM 661	Mathematics Specialists as Teacher Leaders	
STEM 662	Mathematical Assessment for Data Driven Decisions	
STEM 668	Internship for Mathematics Specialist	
Mathematics Content		15
MAPD 601	Number and Operations for PK-8 Mathematics Specialists	
MAPD 602	Geometry and Measurement for PK-8 Mathematics Specialists	
MAPD 603	Rational Numbers and Proportional Reasoning for PK-8 Mathematics Specialists	
MAPD 604	Probability and Statistics for PK-8 Mathematics Specialists	
MAPD 605	Algebra and Functions for PK-8 Mathematics Specialists	
Electives		3
STEM 533	Developing Instructional Strategies PreK-6: Mathematics	
STEM 553	Developing Instructional Strategies for Teaching in the Middle/High School: Mathematics	
Other courses may be taken with permission from the Graduate Program Director.		
Total Hours		33

Master of Science in Education with Initial Licensure 6-12 - Mathematics

There are a number of individuals who have earned B.S. or B.A. degrees who now want to obtain a master's degree leading to licensure as a secondary school teacher. In the program, students complete (or have completed) a minimum of 32 credits of undergraduate courses in one endorsement area (mathematics) and an additional 31-34 credits of education courses at the graduate level.

Students seeking this degree need to apply through the Department of Teaching and Learning.

Master of Science in Education with Initial Licensure 6-12 - Science

There are a number of individuals who have earned B.S. or B.A. degrees who now want to obtain a master's degree leading to licensure as a secondary school teacher. In the program, students complete (or have completed) a minimum of 32 credits of undergraduate courses in one endorsement area (earth science, chemistry, biology, or physics) and an additional 31-34 credits of education courses at the graduate level.

Students seeking this degree need to apply through the Department of Teaching and Learning.

Mathematics Education Specialist Endorsement (PK-8)

Mary Anderson, Program Coordinator

This endorsement program leads to a Mathematics Specialist (PK-8) endorsement for individuals with a current Virginia license and a master's degree related to teaching elementary or middle school mathematics. This program is offered in partnership with the Department of Mathematics and Statistics in the College of Sciences.

Admission

Candidates must:

- Have 3 years of successful classroom experience in teaching mathematics;

- Hold a bachelor's degree from a regionally accredited college/university;
- Hold the Virginia Collegiate Professional License or an equivalent license from another state.
- Have an undergraduate grade point average of 2.80 and an average of 3.00 in the major;
- Achieve a satisfactory score (as established by the Department of Teaching and Learning) on the Graduate Record Examination or the Miller Analogies Test; and
- Submit an application for graduate studies.

Performance in classes taken as a non-degree student will not be taken into consideration in the admission process. Under certain circumstances, applicants who do not fully meet the requirements for regular admission to the program may be admitted on a provisional basis subject to conditions specified by the graduate director for the program.

Continuance

Candidates must maintain a grade point average of 3.00.

Exit

Candidates must:

- Have a 3.00 grade point average;
- Have completed all course requirements;
- Have completed a professional learning portfolio; and
- Submit an application for graduation.

Curriculum

A minimum of 21 semester credits are required. The courses for completion of the endorsement program are:

MAPD 601	Number and Operations for PK-8 Mathematics Specialists	3
MAPD 602	Geometry and Measurement for PK-8 Mathematics Specialists	3
MAPD 603	Rational Numbers and Proportional Reasoning for PK-8 Mathematics Specialists	3
MAPD 604	Probability and Statistics for PK-8 Mathematics Specialists	3
MAPD 605	Algebra and Functions for PK-8 Mathematics Specialists	3
STEM 661	Mathematics Specialists as Teacher Leaders	3
STEM 668	Internship for Mathematics Specialist	3
Total Hours		21

Master of Science-Occupational and Technical Studies

Cynthia Tomovic, Graduate Program Director

This is an advanced master's degree and requires prior academic work associated with this area of study. The M.S. occupational and technical studies program has four concentrations - career and technical education, business and industry training, community college teaching, and STEM education. These studies are designed to help teachers and trainers upgrade their knowledge and skills and prepare for leadership roles in education and training. These programs are all delivered at the Norfolk campus and through the University's distance learning system.

Admission

Students are admitted to the program on a continuing basis. Applications can be obtained from the Admissions Office, distance learning sites, the department and online. Students are admitted for fall, spring, and summer on a rolling basis. Graduate students can complete up to 12 graduate hours with a non-degree application. All applicants to the Master of Science degree

in occupational and technical studies must meet University, college, and department requirements. In addition, all applicants must:

1. hold an undergraduate degree in a related field or have work experience in an occupational/technical area,
2. have an overall grade point average of 2.80 with a 3.00 in major courses,
3. complete the Graduate Record Examination (GRE) with a score in the 45th percentile (verbal and quantitative sections combined) or the Miller Analogy Test with a 45th percentile in the intended major, and
4. submit two letters of recommendation.

Continuance

Students must:

1. complete the Graduate Writing Proficiency Examination administered by the department prior to completing nine credit hours, and
2. maintain a minimum grade point average of 3.00.

Exit

Students in the career and technical education, business and industry training, and STEM education concentrations must complete of 33 semester hours and students in the community college teaching concentration must complete 39 semester hours, as distributed in the M.S. curriculum. In addition, all students must:

1. achieve an overall grade point average of 3.00;
2. complete all competencies listed on course syllabi;
3. pass the written comprehensive examination; and
4. successfully complete a problems paper or thesis.

Curriculum (33-42)

Common Core		9
SEPS 785	Curriculum Development in Occupational Education and Training	
SEPS 788	Instructional Strategies for Innovation in Training and Occupational Education	
SEPS 789	Instructional Technology in Education and Training	
Concentration Specific Courses		6
Select one specialization from the following:		
Career and Technical Education Teaching		
SEPS 760	Trends and Issues in Occupational Education	
SEPS 762	Administration and Management of Education and Training Programs	
Business and Industry Training		
SEPS 761	Foundations of Adult Education and Training	
SEPS 762	Administration and Management of Education and Training Programs	
Community College Teaching		
SEPS 760	Trends and Issues in Occupational Education	
SEPS 761	Foundations of Adult Education and Training	
STEM Education		
STEM 720	STEM Educational Foundations	
STEM 721	Science, Technology, Engineering, and Mathematics Connection and Integration	
Research Core		6-9
SEPS 635	Research Methods in Occupational and Technical Studies	
SEPS 636	Problems in Occupational and Technical Studies	
or SEPS 698	Thesis in Occupational Education	
Professional Technical Specialty		12-18
Career and Technical Education (12 credits) *		
Business and Industry Training (12 credits) *		

Community College Teaching (18 credits) **

STEM Education (12 credits)

Total Hours 33-42

Footnotes

* Credits approved by advisor.

** Credits in teaching specialty.

Doctor of Philosophy in Education – Occupational and Technical Studies Concentration

Cynthia Tomovic, Graduate Program Director

The Ph.D. in Education, occupational and technical studies concentration has three emphases: technology education, career and technical education, and human resources - training. The Ph.D. is delivered on campus and through the University's distance learning system. All students must be on the Norfolk campus for two, two-week summer sessions. The focus of the degree is to prepare university faculty, directors/supervisors of career and technical education, and directors of training departments in business, industry, and government.

The curriculum associated with Old Dominion University's Ph.D. in Education, occupational and technical studies concentration is intended to accomplish the following learning outcomes:

- Every individual who completes this doctoral program, regardless of his/her concentration emphasis, will develop competencies for understanding and using research methods and statistics to make data-based decisions.
- The concentration emphasis will offer courses that enable graduates to know and apply their knowledge in today's complex educational, business, or industry environments and emerge as leaders in their chosen careers.

Note for students in Washington State from the Student Achievement Council (SAC) concerning the Doctor of Philosophy in Education - Occupational and Technical Studies concentration: This program is not intended to lead to teacher certification. Teachers are advised to contact their individual school districts as to whether this program may qualify for teacher advancement.

Admission

Students may enroll in this program full- or part-time. The program faculty reviews all applicants as their application packages are completed. The following weighted criteria are used for admittance:

1. graduate grade point average (15%);
2. undergraduate grade point average (15%);
3. Graduate Record Examination (30%) – minimum combined verbal and quantitative score at 50th percentile or higher;
4. essay, 1500 word, (10%); and
5. goodness of fit with program goals and supporting references (30%).

Graduate assistantships and fellowships may be available. Contact the graduate program director for information.

Entrance

All applicants to the Doctor of Philosophy degree, occupational and technical studies concentration must meet University, college and department requirements. In addition, all applicants must:

1. hold a master's degree related to this field or have worked in occupations related to the degree's outcomes;
2. complete the graduate application with necessary fee;
3. submit an essay statement of academic and professional goals with an emphasis on how the Ph.D. in Education concentration in occupational and technical studies will contribute to the achievement of career

- goals (meets departmental Graduate Writing Proficiency Examination Continuance requirement);
- submit three letters of reference from sources capable of commenting on readiness for advanced graduate study;
 - submit a resume that shows your educational and professional background;
 - submit academic transcripts from all undergraduate and graduate institutions previously attended or currently being attended with a minimum 3.00 graduate grade point average;
 - submit scores from the Graduate Record Examination that have been earned within the past five years with a score at or above the 50th percentile on the verbal and quantitative components; and
 - if the applicant's primary language is not English, submit a current score for the Test of English as a Foreign Language (TOEFL) that meets the University's current standard.

Applications for admission are on a rolling basis. Graduate assistantships are awarded in February annually.

Continuance

Students must:

- have their Ph.D. program approved;
- successfully complete annual progress reviews;
- meet faculty and University program expectations;
- complete the departmental Graduate Writing Proficiency Examination; and
- meet professional development and career preparation expectations.

Exit

Students must:

- complete a minimum of 60 credit hours beyond the master's degree;
- complete all competencies listed on course syllabi;
- achieve an overall grade point average of 3.00;
- pass the written comprehensive examination;
- select a dissertation committee;
- prepare and defend a dissertation prospectus;
- successfully complete a dissertation with an oral defense; and
- complete the graduate student University assessment.

Prerequisites

A master's degree in an appropriate field related to this concentration is required for admission to the Ph.D. program. Students who do not have equivalent coursework or appropriate educational experiences must complete the following prerequisite courses:

FOUN 612	Applied Research Methods in Education	3
FOUN 722	Introduction to Applied Statistics and Data Analysis	3
SEPS 785	Curriculum Development in Occupational Education and Training	3
SEPS 788	Instructional Strategies for Innovation in Training and Occupational Education	3
SEPS 789	Instructional Technology in Education and Training	3
Total Hours		15

Curriculum (60 credits minimum)

Students in the occupational and technical studies concentration complete core courses in research, the occupational and technical studies concentration, and an emphasis in either career and technical education, human resources development, or technology education along with 6 credit hours of electives.

Research Core		12
FOUN 812	Research Design and Analysis	
FOUN 813	Program Evaluation in Education	
FOUN 814	Qualitative Research Design in Education	
FOUN 822	Applied Linear Models in Educational Research	
or FOUN 823	Analysis of Variance Applied to Educational Research	
Concentration		18
Must be taken with one emphasis area-Technology Education, Career and Technical Education, or Human Resources-Training		
SEPS 860	Trends and Issues in Occupational Education	
SEPS 862	Administration and Management of Education and Training Programs	
SEPS 865	Trends and Issues of Economic and Workforce Development	
SEPS 885	Curriculum Development in Occupational Education and Training	
SEPS 888	Instructional Strategies for Innovation in Training and Occupational Education	
SEPS 889	Instructional Technology in Education and Training	
Technology Education Emphasis		12
SEPS 840	Readings in Occupational and Technical Studies	
STEM 830	Introduction to Technology	
STEM 831	Technical Systems	
STEM 832	Program Development for Technology Education	
Career and Technical Education Emphasis		12
ELS 626	Instructional Supervision, Staff Development, and Assessment	
SEPS 840	Readings in Occupational and Technical Studies	
SEPS 868	Internship	
SEPS 887	Career and Technical Education Curriculum	
Human Resources - Training Emphasis		12
IDT 846	Foundations of Distance Education	
SEPS 840	Readings in Occupational and Technical Studies	
SEPS 850	Trends and Issues in Training: Modeling and Simulation	
SEPS 861	Foundations of Adult Education and Training	
Electives		6
Electives are selected in consultation with the advisor. They should be planned and included in the student's program of study.		
Capstone Courses		12 -15
FOUN 881	Dissertation Seminar	
SEPS 899	Dissertation in Occupational Education	
Total Hours		84-87

Endorsement Program in Industrial Cooperative Training

Philip Reed, Program Coordinator

The endorsement program in industrial cooperative training is designed to prepare a licensed teacher to be endorsed to teach industrial cooperative training in the public schools.

Admission

Students may enroll in this teaching endorsement program as a non-degree student. If an M.S. degree is sought, some graduate level courses may be applied toward professional technical studies in this component of the degree. Admission should be sought into the M.S. program in occupational and technical studies with a concentration in career and technical education teaching. Graduate students can complete up to 12 graduate hours with a non-degree application. Students should contact the program coordinator to discuss admissions options. Prior to entering this program, students must have or qualify for a Virginia Collegiate Professional or Postgraduate Professional License. Secondly, they must be interviewed and accepted by the program coordinator.

Continuance and Exit

Students must:

1. complete the following courses:

STEM 305	Curriculum for Technology Education	3
or SEPS 400/500	Instructional Systems Development	
SEPS 401/501	Foundations of Career and Technical Education	3
STEM 306	Methods for Technology Education	3
SEPS 503	Methods in Career and Technical Education	3
or SEPS 788	Instructional Strategies for Innovation in Training and Occupational Education	
SEPS 408/508	Advanced Classroom Issues and Practices in Career and Technical Education	3
SEPS 450/550	Assessment, Evaluation and Improvement	3
Total Hours		18

2. earn a 2.75 cumulative grade point average if licensure is at the undergraduate level and a 3.00 cumulative grade point average if licensure is at the graduate level; and
3. document at least 4000 clock hours of acceptable employment in a trade, technical, or industrial education subject area completed within the past five years.

Twelve hours of 500/600 level courses may be applied toward the Master of Science in occupational and technical studies, career and technical education teaching concentration.

Marketing Teacher Education with Licensure

Michael F. Kosloski, Program Coordinator

The licensure program in marketing teacher education is designed to prepare a person who has a baccalaureate degree to be a marketing education teacher-coordinator. Participants who successfully complete this program will qualify to apply for a Virginia teaching license to teach marketing education.

Admission

Students can complete this licensure program through an undergraduate degree program, second undergraduate degree, graduate non-degree seeking level, or through the M.S. program. Students should meet with the program coordinator to discuss these options. Graduate students can complete up to 12 graduate hours with a non-degree application. Prior to entering this program students must hold a baccalaureate degree. Students must also have completed a rigorous general education program as outlined by the Commonwealth in its Licensure Regulations for Teachers. They must be interviewed and accepted by the program coordinator. Finally, students must successfully complete the required tests for seeking a Virginia teaching license (see advisor or Teacher Education Services). Students must be admitted into the approved marketing education teacher preparation program prior to enrolling in practicum education courses.

Continuation and Exit

Students must:

1. complete the following courses:

SEPS 297	Observation and Participation	1
SEPS 400/500	Instructional Systems Development	3
SEPS 401/501	Foundations of Career and Technical Education	3
SEPS 408/508	Advanced Classroom Issues and Practices in Career and Technical Education	3
SEPS 450/550	Assessment, Evaluation and Improvement	3
SEPS 485	Student Teaching	12
SPED 313	Fundamentals of Human Growth and Development: Birth through Adolescence	3
TLED 408 or READ 680	Reading and Writing in Content Areas Reading to Learn Across the Curriculum	3
Total Hours		31

2. earn a 2.75 cumulative grade point average if licensure is at the undergraduate level and a 3.00 cumulative grade point average if licensure is at the graduate level;
3. document at least 4000 clock hours of marketing-related work experience completed within the past five years or complete a directed field experience (SEPS 405);
4. earn credit in marketing related courses to include the marketing process, economics, merchandising, advertising, personal selling, marketing math, communication, ethics, training, international marketing, and marketing technology;
5. complete a university graduate student assessment if enrolled in the M.S. degree program.

Twelve hours of 500/600 level courses may be applied toward the Master of Science in occupational and technical studies, career and technical education teaching concentration.

M.S. Degree in Technology Education with Licensure

Philip Reed, Program Coordinator

The M.S. degree in in technology education with licensure is designed to prepare a person who has a baccalaureate degree and industrial/military related technical experience to be a technology education teacher. Participants who successfully complete this program will receive a Master of Science degree and qualify to apply for a Virginia teaching license to teach technology education.

Admission Information

To earn the M.S. with licensure to teach technology education, candidates have to be accepted into the M.S. concentration in career and technical education teaching. Graduate students can complete up to 12 graduate hours with a non-degree application. Student must meet with the program coordinator to have military and other technical content courses reviewed to determine their applicability toward licensure requirements. Prior to entering this program students must hold a baccalaureate degree with a major related to technology/engineering or have completed military schools equating to a minimum of 18 credits in industrial technology areas as evaluated by the American Council on Education (ACE Guide). Students must also have completed a rigorous general education program as outlined by the Commonwealth in its Licensure Regulations for Teachers. They must be interviewed and accepted by the program coordinator. Finally students must successfully complete the required tests for seeking a Virginia teaching license (see advisor or Teacher Education Services). Students must be admitted into the approved technology education teacher preparation program prior to enrolling in any practicum education courses.

Continuance and Exit

Students must:

1. complete the following courses:		
FOUN 612	Applied Research Methods in Education	3
READ 680	Reading to Learn Across the Curriculum	3
SEPS 508	Advanced Classroom Issues and Practices in Career and Technical Education	3
SEPS 586	Middle School Student Teaching for Technical Education	6
SEPS 596	Topics in Career and Technical Education	1-3
SEPS 636	Problems in Occupational and Technical Studies	3
SEPS 788	Instructional Strategies for Innovation in Training and Occupational Education	3
SEPS 789	Instructional Technology in Education and Training	3
SPED 313	Fundamentals of Human Growth and Development: Birth through Adolescence	3
STEM 231	Materials and Processes Technology	3
STEM 320	Manufacturing and Construction Technology	3
STEM 350	Communication Technology Processes	3
STEM 351	Communication Technology	3
STEM 730	Introduction to Technology	3
TLED 608	Foundations of Education and Instructional Assessment	3
TLED 616	Design for Effective Instruction	3
Total Hours		49-51

2. earn a 2.75 cumulative grade point average on undergraduate level courses and a 3.00 cumulative grade point average at the graduate level,
3. earn passing scores on Virginia LicensureTest before the teacher internship (see advisor or Teacher Education Services); and
4. complete the graduate student University assessment.

Completing this licensure program and other departmental requirements will allow the candidate to earn the Master of Science in occupational and technical studies, career and technical education teaching concentration.

Education Specialist-Occupational and Technical Studies

Cynthia Tomovic, Graduate Program Director

The Department of STEM Education and Professional Studies jointly offers the education specialist (Ed.S.) with the Department of Educational Foundations and Leadership. The program offers a cohesive sequence of academic studies designed to help graduates deal effectively with administrative problems encountered in urban schools and agencies. Principalship can be planned into the educational specialist degree.

Admission

To be admitted to the Ed.S. program, an applicant must:

1. Hold a master's degree in career and technical education or related field;
2. Have a successful experience as an administrator or teacher;
3. Hold a teaching license or equivalent; and
4. Have taken ELS 600 or its equivalent as a prerequisite.

Students seeking this degree need to apply through the Ed.S. program in the Department of Educational Leadership and Counseling.

Entrance

Students must:

1. meet all University requirements,
2. provide two letters of recommendation;
3. hold a master's degree from an accredited institution (minimum 3.25 graduate grade point average),

4. provide a one-page essay explaining why he/she should be admitted to the program; and
5. have an acceptable score on the GRE or Miller Analogies Test.

Continuance

Students must meet all University requirements and maintain a 3.00 or higher grade point average.

Exit

Students must successfully complete:

1. a written comprehensive examination,
2. the required course of study,
3. have a 3.00 grade point average or above, and
4. complete a university graduate student assessment.

Curriculum (33 credits)

Requirements for the Ed.S. with a specialty in occupational and technical studies include 30-33 semester hours (18 hours must be completed in 800-level courses in ELS), as follows:

Prerequisites *		3-12
ELS 610	School Community Relations and Politics	
ELS 621	Curriculum Development and Assessment	
ELS 657	Public School Law	
Educational Leadership		18
ELS 853	Educational Finance and Budgeting	
ELS 854	Human Resource Development and Evaluation	
ELS 871	Educational Systems Planning and Futures	
ELS 876	Leadership for Social Justice	
ELS 878	Leadership for Teaching and Learning	
ELS 879	Field Research in School Administration and Supervision	
Occupational and Technical Studies		15
SEPS 860	Trends and Issues in Occupational Education	
SEPS 862	Administration and Management of Education and Training Programs	
SEPS 885	Curriculum Development in Occupational Education and Training	
SEPS 888	Instructional Strategies for Innovation in Training and Occupational Education	
SEPS 889	Instructional Technology in Education and Training **	
Total Hours		36-45

* ELS 610, ELS 621, and ELS 657 are prerequisites for the principalship endorsement.

** and/or other courses approved by the candidate's advisor

Department of Teaching & Learning

145 Education Building
757-683-3283, 757 683-3284

Gail Dickinson, Interim Chair

The Department of Teaching and Learning offers programs leading to the Master of Science in Education Degree with majors in Early Childhood, Elementary, Reading Specialist, and Secondary Education; and the Doctor of Philosophy in Education Degree with concentrations in Early Childhood, Literacy Leadership, and a variety of other curriculum areas. Programs leading to the Master of Science in Education Degree include the 5-year undergraduate/graduate program leading to the Bachelor of Science in Interdisciplinary Studies through the College of Arts and Letters with

continuation into the Masters of Science in Education Degree with initial teacher licensure in Early Childhood or Elementary Education. State-approved teacher preparation programs at the graduate level are also available for individuals with non-teaching bachelor degrees interested in licensure at the Elementary, Middle, or Secondary school grade levels. Additionally, the Department of Teaching & Learning offers programs leading to state licensure in Library Science, Reading Specialist, and Mathematics Specialist. Licensed teachers may select from several Master's degree or Post-baccalaureate endorsement programs as listed below.

Early Childhood Education

- Master of Science in Education, Early Childhood, Research Concentration (non-licensure)
- Master of Science in Education, Early Childhood, PreK-3, Initial Licensure
- Early Childhood, PreK-3, Post-baccalaureate Endorsement
- Doctor of Philosophy, Curriculum and Instruction, Early Childhood Concentration

Elementary Education

- Master of Science in Education, Elementary Education, PreK-6, Initial Licensure
 - Interdisciplinary Studies (IDS)
 - Non-interdisciplinary Studies
 - Military Career Transition (MCTP)
- Elementary Education, PreK-6, Post-baccalaureate Endorsement
- Master of Science in Education, Elementary Education, Middle School, 6-8, Initial Licensure
 - Campus-based
 - Military Career Transition (MCTP)
- Elementary Education, Middle School, 6-8, Post-baccalaureate Endorsement
- Master of Science in Education, Elementary Education, Licensed Teachers
 - Campus-based
 - Field-Based
- Master of Science in Education, Elementary Education, Library Science, Initial Licensure
- Elementary Education, Library Science, Post-baccalaureate Endorsement
- Master of Science in Education, Elementary Education, Library Science, Licensed Teachers
- Master of Science in Education, Elementary Education, Mathematics Specialist, PreK-8
- Elementary Education, Mathematics Specialist, PreK-8, Post-baccalaureate Endorsement

Secondary Education

- Master of Science in Education, Secondary Education, 6-12, Initial Licensure
 - Campus-based
 - Military Career Transition (MCTP)
- Secondary Education, 6-12, Post-baccalaureate Endorsement
- Master of Science in Education, Secondary Education, 6-12, Licensed Teachers
 - Campus-based
 - Field-Based
- Master of Science in Education, Secondary Education, Library Science, K-12, Initial Licensure
- Master of Science in Education, Secondary Education, Library Science, K-12, Licensed Teachers
- Secondary Education, Library Science, K-12, Post-baccalaureate Endorsement

- Master of Science in Education, Secondary Education, Teachers of English to Speakers of Other Languages (TESOL), K-12, Initial Licensure
- Secondary Education, Teachers of English to Speakers of Other Languages (TESOL), K-12, Post-baccalaureate Endorsement

Reading Education

- Master of Science in Education, Reading Specialist, K-12, Licensed Teachers
- Reading Specialist, K-12, Post-baccalaureate Endorsement
- Doctor of Philosophy in Education, Curriculum and Instruction, Literacy Leadership Concentration

Doctor of Philosophy in Education - Curriculum and Instruction

- Doctor of Philosophy in Education, Curriculum and Instruction, (Choice of Concentration)
- Doctor of Philosophy in Education, Curriculum and Instruction, Literacy Leadership Concentration
- Doctor of Philosophy in Education, Curriculum and Instruction, Early Childhood Education Concentration

Due to changing University requirements, national accreditation standards, and Commonwealth licensure regulations, the programs in the Darden College of Education are under constant revision. Any changes resulting from these factors supersede the program requirements described in the catalog. Students are encouraged to obtain current program information from their advisors and the Darden College of Education website at <http://odu.edu/education>.

Early Childhood Education

Early Childhood Education programs offered include:

1. Master of Science in Education-Early Childhood with two concentration options: Research or Initial Licensure
2. Early Childhood Education, PreK-3, Post-baccalaureate Endorsement

Master of Science in Education, Early Childhood, Research Concentration (non-licensure)

145 Education Building
757-683-3284

Charlene Fleener, Program Director

A master's degree in early childhood education with a research emphasis will provide educators with an advanced professional degree and qualifications beyond licensure. Course work for the degree includes a focus on scholarly research, statistical analysis, and writing for professional journals. This degree is also suitable for student who wish to pursue a doctoral degree.

Admission

Admission to the graduate program in early childhood education is granted by the graduate program director in conjunction with early childhood faculty. The following requirements are necessary for admission to the program. Students must:

1. hold a baccalaureate degree from a regionally accredited institution;
2. have an undergraduate GPA of 3.0 or better;
3. submit satisfactory scores on the Graduate Record Examination (GRE) or a Miller Analogies Test (MAT); and,
4. submit a 400-500 word goal statement indicating personal goals and motivation for pursuing the early childhood education program

Under certain circumstances, applicants who do not fully meet the requirements for regular admission to the program may be admitted on a

provisional basis subject to the conditions specified by the graduate program director.

Continuance

Students must:

1. maintain a grade point average of 3.00 overall, and
2. successfully complete all competencies relative to the program of study
3. complete the Responsible Conduct of Research (RCR) modules during your first twelve graduate credit hours at Old Dominion University. For more information review the instructions at: <http://www.odu.edu/education/resources/conduct-of-research-instructions>.

Exit

Students must:

1. have a grade point average of 3.00 overall and a grade of B- or better in all course work;
2. satisfactorily complete all program requirements, including the comprehensive examination;
3. complete a Graduate Assessment (Survey); and
4. submit a written research project according to the program guidelines prior to the awarding of the Master of Science in Education degree.

Program Requirements

The master's degree requires a minimum of 30 credits of graduate study.

Curriculum

Required Research Courses		15
FOUN 612	Applied Research Methods in Education	
FOUN 722	Introduction to Applied Statistics and Data Analysis	
FOUN 641	Assessment and Evaluation of Student Learning	
TLCI 735	Connecting Research In Early Developmental Practice in Early Childhood Education	
TLED 636	Problems in Education	
Required Core Courses		15
SPED 700	Social/Emotional Aspects of Child Development	
TLCI 736	Working with At-Risk Children and Families: An Ecological Approach	
SPED 868	Internship: Special Education	
TLCI 740	Issues in Early Childhood Language and Literacy	
SPED 500	Foundations of Special Education: Legal Aspects and Characteristics	
Total Hours		30

Master of Science in Education, Early Childhood, PreK-3, Initial Licensure

145 Education Building
757-683-3284

Charlene Fleener, Graduate Program Director

This program is designed for prospective teachers who have completed the undergraduate program in teacher education primary/elementary offered by the Department of Interdisciplinary Studies in the College of Arts and Letters at Old Dominion University.

Admission

All students must apply for and be admitted into the approved M.S. Ed with initial licensure program for Early Childhood Education (grades PreK-3). The following admission criteria must be met:

1. The Bachelor of Science Degree in Interdisciplinary Studies with a concentration in teacher education, primary/elementary from the College of Arts and Letters at Old Dominion University is required.
2. Students must meet the criteria for admission by passing the Virginia Board of Education prescribed assessments and earning the minimum required grade point averages (GPA). Virginia Board of Education prescribed assessments are outlined in the Teacher Education Services and Advising section of this catalog. To review more information on the Virginia Board of Education prescribed assessments, visit the Teacher Education Services website, <http://www.odu.edu/tes>.
3. A cumulative undergraduate GPA of 2.80 is required for admission.
4. No courses in the academic major in which the student has made below a C will be accepted for admission in the Darden College of Education.
5. Satisfactory scores must be submitted on either the Graduate Record Examination or Miller Analogies Test. A combined verbal and quantitative score of 290 is required on the GRE, with at least a minimum score of 146 on the verbal section. A minimum score of 399 is required on the MAT.
6. An application for graduate studies and official transcripts must be submitted by the appropriate deadline for admission. Under certain circumstances, applicants who do not fully meet the requirements for regular admission to the program may be admitted on a provisional basis subject to conditions specified by the graduate program director for early childhood, PreK--3, education.

Continuance

1. Students must maintain a cumulative GPA of 3.00 and a minimum of 3.00 GPA in the major.
2. A grade of "B" or higher is required in all practicum coursework.
3. Complete the Responsible Conduct of Research (RCR) modules during the first twelve graduate credit hours at Old Dominion University. For more information review the instructions at: <http://www.odu.edu/education/resources/conduct-of-research-instructions>.
4. Students must take and pass all Virginia Board of Education prescribed assessments including the Reading for Virginia Educators (RVE) coded 0306 paper delivered or 5306 computer delivered, the Virginia Communication and Literacy Assessment (VCLA), and the Praxis II code 5031 computer delivered, prior to or while enrolled in the Seminar in Teacher Education (TLED 583) course.
5. All course work in the program must be completed with at least a 3.00 graduate GPA, a grade of B in the advanced graduate practicum, and all assessments must be passed prior to attending the Teacher Candidate Internship Orientation session.
6. A grade of B- or higher is required in all professional education courses in the master's degree.
7. A criminal background check must be completed prior to placement in a field experience required for practicum courses and for the teacher candidate internship. For more information, please review the policy in the Teacher Education Services website <http://www.odu.edu/tes>.

To review more information on the Virginia Board of Education prescribed assessments visit the Teacher Education Services website, <http://www.odu.edu/tes>.

Exit

Requirements for graduation include:

1. Passage of the written comprehensive exam;
2. Completion of the Graduate Assessment;
3. A minimum cumulative 3.00 GPA, successful completion of the Teacher Candidate Internship, an exit interview, and submit an application for graduation. No courses in the academic major in which the student earned below a C and no courses in professional education in which the student earned below a B- will be accepted toward licensure requirements in the Darden College of Education.

Curriculum

Prerequisite *

TLED 474/574	Foundations and Contemporary Issues in Early Childhood Education (if not completed in BS program)	3
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Required Courses

READ 683	Diagnostic Teaching of Reading in the Classroom	3
SPED 500	Foundations of Special Education: Legal Aspects and Characteristics	3
TLED 592	Integrating Mathematics and Science Across the Curriculum, PK-3	3
FOUN 641	Assessment and Evaluation of Student Learning	3
TLED 677	Advanced Child Development Theory and Research	3
TLED 690	The Child and the Family	3
TLED 679	Advanced Classroom Management and Practicum in PreK-6	3
TLED 583	Seminar in Teacher Education	1
TLED 668	Internship/Student Teaching and Seminar	9
Total Hours		34

* If not completed in the BS IDS Teacher Preparation Concentration program.

Due to changing University requirements, national standards, and the Virginia Board of Education licensure regulations, the programs in the Darden College of Education are under constant revision. Any changes resulting from these factors supersede the program requirements described in this Catalog. Students are encouraged to obtain current program information from their advisors and from the Teacher Education Services website: <http://www.odu.edu/tes>.

Early Childhood Education, PreK-3, Post-baccalaureate Endorsement

145 Education Building
757-683-3284

Charlene Fleener, Graduate Program Director

This program is available only to students who already possess an undergraduate degree from Old Dominion University in Interdisciplinary Studies (IDS) Teacher Preparation concentration and who want to obtain a Virginia teaching license with an endorsement in preschool through grade three.

Admission

All students must apply for and be admitted into the approved post-baccalaureate endorsement program for Early Childhood Education (grades PreK-3). The following admission criteria must be met:

1. A bachelor's degree from Old Dominion University in Interdisciplinary Studies (IDS) Teacher Preparation concentration is required to be considered for admission in this program.
2. Students must meet the required criteria for admission by passing the Virginia Board of Education prescribed assessments and earning the minimum required grade point averages (GPA) below. Virginia Board of Education prescribed entry assessments are outlined in the Teacher Education Services and Advising section of the catalog. Virginia Board of Education prescribed assessments:
 - A passing Praxis I composite score of 532 by December 31, 2013 or
 - Passing Praxis Core section scores (Reading Score of 156, Writing Score of 162, and Math Score of 150) beginning January 1, 2014 or
 - Qualifying SAT or ACT test scores or

- Praxis I Math test score of 178 and a composite Virginia Communication and Literacy (VCLA) score of 470 by December 31, 2013 or
- Praxis Core Math test score of 150 and a composite Virginia Communication and Literacy (VCLA) score of 470 beginning January 1, 2014 or
- SAT Mathematics test score of 530 and a composite Virginia Communication and Literacy (VCLA) score of 470 or
- ACT Mathematics test score of 22 and a composite Virginia Communication and Literacy (VCLA) score of 470

*To review more information on the Virginia Board of Education prescribed assessments visit the Teacher Education Services website, <http://www.odu.edu/tes>.

3. A cumulative undergraduate GPA of 2.75 is required for admission.
4. No courses in the academic major or professional education in which the student has made below a C will be accepted for admission in the Darden College of Education.
5. An application for non-degree admission must be submitted by the appropriate deadline for admission.

Continuance

1. Students must maintain GOOD ACADEMIC standing as noted on the academic transcript.
2. A grade of "B" or higher is required in all practicum coursework.
3. Students must complete the Responsible Conduct of Research (RCR) modules during the first twelve graduate credit hours at Old Dominion University. For more information review the instructions at: <http://www.odu.edu/education/resources/conduct-of-research-instructions>.
4. Students must take and pass all Virginia Board of Education prescribed assessments including the Reading for Virginia Educators (RVE) coded 0306 paper delivered or 5306 computer delivered, the Virginia Communication and Literacy Assessment (VCLA), and the Praxis II code 5031 computer delivered, prior to or while enrolled in the Seminar in Teacher Education (TLED 583) course.
5. All assessments must be passed prior to the Teacher Candidate Internship Orientation session. A criminal background check must be completed prior to placement in a field experience required for practicum courses and for the teacher candidate internship. For more information, please review the policy in the Teacher Education Services website: <http://www.odu.edu/tes>. To review more information on the Virginia Board of Education prescribed professional assessments, visit the Teacher Education Services website, <http://www.odu.edu/tes>.

Exit

Requirements for completion are:

1. GOOD ACADEMIC standing, successful completion of the Teacher Candidate Internship, complete all course requirements, and submit an application for Virginia licensure.
2. No courses in the academic major or professional education in which the student earned below a C will be accepted toward licensure requirements in the Darden College of Education.

Program Requirements

Students seeking initial licensure for grades PreK-3 must meet the academic content knowledge requirements with a minimum grade of C. Transcripts will be evaluated by the teacher education advisor to determine whether these academic requirements have been met by previous course work at the undergraduate level. Subject area specific course work that was not met in previous course work must be completed prior to Teacher Candidate Internship (student teaching) orientation session.

Curriculum

Prerequisite Courses		12
TLED 301	Foundations and Introduction to Assessment of Education	
TLED 430/530	PK-12 Instructional Technology	
SPED 313	Fundamentals of Human Growth and Development: Birth through Adolescence	
TLED 468/568	Language Acquisition and Reading for Students with Diverse Learning Needs	
Required Courses		28
SPED 406/506	Students with Diverse Learning Needs in the General Education Classroom	
TLED 474/574	Foundations and Contemporary Issues in Early Childhood Education	
TLED 592	Integrating Mathematics and Science Across the Curriculum, PK-3	
TLED 593	Integrating Children's Literature, Language Arts and Social Studies Across the ECE Curriculum	
TLED 690	The Child and the Family	
TLED 679	Advanced Classroom Management and Practicum in PreK-6	
READ 683	Diagnostic Teaching of Reading in the Classroom	
TLED 583	Seminar in Teacher Education	
TLED 669	Internship/Student Teaching and Seminar	
Total Hours		40

In order for a student to move from the Post-baccalaureate Endorsement program into the master's program in early childhood, graduate admission must be granted prior to completing 12 semester hours of graduate work. If accepted into the program, only up to 12 semester hours can be counted toward the graduate degree.

Due to changing University requirements, national standards, and the Virginia Board of Education licensure regulations, the programs in the Darden College of Education are under constant revision. Any changes resulting from these factors supersede the program requirements described in this Catalog. Students are encouraged to obtain current program information from their advisors and from the Teacher Education Services website: <http://www.odu.edu/tes>.

Doctor of Philosophy in Education, Curriculum and Instruction, Early Childhood Education Concentration

145 Education Building
757-683-3284

Angela Eckhoff, Advisor

The Doctor of Philosophy in Curriculum and Instruction at the Darden College of Education of Old Dominion University, with concentrations in Curriculum and Instruction, Early Childhood Education, and Literacy Leadership provides the opportunity for students to become scholarly leaders to serve our nation's schools, colleges, universities and related agencies such as business, government, and research institutions to contribute to global education. The curricula is solidly grounded in interpreting and producing research, use of technology to enhance the teaching/learning process, equity, and leadership, which are woven into common core courses and concentration-specific courses.

Early Childhood Education Emphasis:

The PhD in Education with a concentration in Early Childhood Education program, through its integral partnership with the Old Dominion University Child Study and Development Centers, focuses on the multidisciplinary study of the cognitive, language, and healthy social/emotional development

of young children from birth to age nine. The program prepares students to become faculty in colleges and universities and senior administrators in institutions and agencies. Personalized mentorship and professional training is provided for those who desire careers in academic research, child advocacy, program design and evaluation, and higher education, including teacher preparation, policy, and administrative leadership.

See the PhD in Curriculum and Instruction for complete program information.

Elementary Education

General Description of Elementary Education

Elementary programs include the Master of Science in Education degree program and four Post-baccalaureate licensure programs. Within the Master of Science in elementary education degree program there are a number of concentrations and emphasis area choices for both licensed teachers as well as those seeking initial licensure or endorsement. For those seeking initial licensure there are the following concentration areas: PreK-6, middle school 6-8, and library science K-12 (Note: the library science concentration may also be done through Master of Science in Education - Secondary). For licensed teachers seeking additional education there are the following concentration areas: math specialist PK-8, library science K-12 (Note: the library science concentration may also be done through Master of Science in Education - Secondary), elementary generalist, and field-based. Post-baccalaureate endorsement programs are designed for individuals with a non-teaching B.S. or B. A. degree who want to obtain licensure or for those with a teaching license who want to be licensed in an additional teaching area. The four endorsement programs offered in elementary education are PreK-6, Middle School 6-8, Library Science K-12, and Mathematics Specialist PreK-8.

145 Education Building
757-683-3284

Charlene Fleener, Graduate Program Director

Master of Science in Education, Elementary Education, PreK-6, Initial Licensure

145 Education Building
757-683-3284

Charlene Fleener, Graduate Program Director

Lindsay Davis, Advisor

Arminda Israel, Military Career Transition Program Coordinator & Veteran Advisor

This master's program in elementary school education (PreK-6) is designed for individuals with a non-teaching B.S. or B. A. degree who want to obtain licensure as a teacher in preschool through grade six and earn a master's degree at the same time. The PreK-6 initial licensure concentration offers three different emphasis areas: Interdisciplinary Studies (those getting a B. S. degree in Interdisciplinary Studies from ODU), Non-interdisciplinary Studies (those with other non-teaching undergraduate degrees) and Military Career Transition (MCTP). For those seeking initial licensure in the area of library science see the Library Science (School Librarianship K-12) section for complete program information.

Note to students in Washington State from the Student Achievement Council (SAC) concerning the Master of Science in Education - (Pre-K through 6): Eligibility for initial educator certification in Washington is based on completion of a state approved educator preparation program. This program is approved in Virginia and is authorized for field placements in Washington by the Professional Educators Standards Board. Even though you may be residing in Washington while in this program, your application for educator certification in Washington will be processed as an out-of-state application. Go to <http://pathway.pesb.wa.gov/outofstate> for more information. Teachers are advised to contact their individual school districts as to whether or not this program may qualify for teacher advancement.

Admission

All students must apply for and be admitted into the approved M.S. Ed with initial licensure program for Elementary Education (grades PreK-6). Admission criteria include the following:

For the Non-interdisciplinary Studies emphasis area a bachelor's degree from a regionally accredited college/university is required in the liberal arts and sciences (or equivalent) including specific course work to meet Virginia's stated coursework competencies for elementary education (PreK-6) subject area preparation.

For the Military Career Transition (MCTP) emphasis area see Military Career Transition (MCTP) section for complete program information

For the Interdisciplinary Studies emphasis area the Bachelor of Science Degree in interdisciplinary studies with a teacher preparation concentration, primary/elementary from the College of Arts and Letters at Old Dominion University is required. Students must meet the required criteria for admission by passing the Virginia Board of Education prescribed assessments and earning the minimum required grade point averages (GPA).

- Students must meet the required criteria for admission by passing the Virginia Board of Education prescribed assessments and earning the minimum required grade point averages (GPA).
- Virginia Board of Education prescribed assessments are outlined in the Teacher Education Services and Advising section of this catalog. Virginia Board of Education prescribed assessments:
 - A passing Praxis I composite score of 532 by December 31, 2013 or
 - Passing Praxis Core section scores (Reading Score of 156, Writing Score of 162, and Math Score of 150) beginning January 1, 2014 or
 - Qualifying SAT or ACT test scores or
 - Praxis I Math test score of 178 and a composite Virginia Communication and Literacy (VCLA) score of 470 by December 31, 2013 or
 - Praxis Core Math test score of 150 and a composite Virginia Communication and Literacy (VCLA) score of 470 beginning January 1, 2014 or
 - SAT Mathematics test score of 530 and a composite Virginia Communication and Literacy (VCLA) score of 470 or
 - ACT Mathematics test score of 22 and a composite Virginia Communication and Literacy (VCLA) score of 470
- Information on the Virginia Board of Education prescribed assessments visit the Teacher Education Services website, <http://www.odu.edu/tes>.
- A cumulative undergraduate GPA of 2.80 is required for admission.
- No courses in the academic major in which the student has made below a "C" will be accepted for admission in the Darden College of Education.
- No course in professional education in which the student has made a grade below a "B-" will be accepted in the Darden College of Education.
- Satisfactory scores must be achieved on either the Graduate Record Exam (GRE) or the Miller Analogy Test (MAT). A combined verbal and quantitative score of 290 is required on the GRE, with at least a minimum score of 146 on the verbal section. A minimum score of 399 is required on the MAT.
- An application for graduate studies, and official transcripts must be submitted by the appropriate deadline for admission. Under certain circumstances, applicants who do not fully meet the requirements for regular admission to the program may be admitted on a provisional basis subject to conditions specified by the graduate program director for elementary/middle education.

Exit

Requirements for graduation include:

- Submit an application for graduation;
- Passage of the written comprehensive exam;
- Completion of the Graduate Assessment;
- A minimum cumulative 3.00 graduate GPA;

- Successful completion of the Teacher Candidate Internship;
- An exit interview;
- Complete all course requirements; and
- No courses in the professional education area with a grade below "B-" will be accepted toward licensure requirements in the Darden College of Education.

Program Requirements

Students seeking initial licensure plus a master's degree in elementary education (grades PreK-6) must meet the academic content requirements with a minimum grade of "C". Transcripts will be evaluated by the education advisor to determine whether these academic requirements have been met by previous course work. Subject area specific course work that was not met in previous course work must be completed prior to Teacher Candidate Internship (student teaching) orientation session.

Curriculum - Interdisciplinary Studies and Non-interdisciplinary Studies Emphasis Areas. Military Career Transition (MCTP) curricular requirements may be found in the Military Career Transition (MCTP) section.

Prerequisite Undergraduate Professional Education Classes		27
TLED 301	Foundations and Introduction to Assessment of Education	
TLED 430/530	PK-12 Instructional Technology	
TLED 468/568	Language Acquisition and Reading for Students with Diverse Learning Needs	
SPED 313	Fundamentals of Human Growth and Development: Birth through Adolescence	
TLED 432	Developing Instructional Strategies PreK-6: Language Arts	
STEM 433	Developing Instructional Strategies PreK-6: Mathematics	
STEM 434	Developing Instructional Strategies PreK-6: Science	
TLED 435	Developing Instructional Strategies PreK-6: Social Studies	
TLED 479	Classroom Management and Practice PreK-3; PreK-6	
Graduate Professional Education Courses		31
SPED 506	Students with Diverse Learning Needs in the General Education Classroom	
TLED 690	The Child and the Family	
READ 680	Reading to Learn Across the Curriculum	
LIBS 642	Children's Literature Across the Curriculum, PK-8	
FOUN 641	Assessment and Evaluation of Student Learning	
TLED 677	Advanced Child Development Theory and Research	
TLED 679	Advanced Classroom Management and Practicum in PreK-6	
TLED 583	Seminar in Teacher Education	
TLED 668	Internship/Student Teaching and Seminar	
Total Hours		58

Due to changing University requirements, national standards, and the Virginia Board of Education licensure regulations, the programs in the Darden College of Education are under constant revision. Any changes resulting from these factors supersede the program requirements described in this Catalog. Students are encouraged to obtain current program information from their advisors and from the Teacher Education Services website: <http://www.odu.edu/tes>.

Elementary Education, PreK-6, Post-Baccalaureate Endorsement

145 Education Building
757-683-3284

Charlene Fleener, Graduate Program Director

Lindsay Davis, Advisor

Many students who already possess an undergraduate degree enter Old Dominion University for the sole purpose of meeting Virginia's teaching licensure standards. When these students apply for admission into an approved teacher education program, they are considered to be post-baccalaureate endorsement program candidates and must meet the college's policy for admitting students into an approved teacher education program. Admission to Old Dominion University does not guarantee admission into the post-baccalaureate endorsement teacher preparation programs in the Darden College of Education. The PreK-6 "post-baccalaureate endorsement" option is available for those students who wish to pursue licensure and do not meet the master's degree admission requirements or who do not wish to pursue the master's degree.

This licensure program in elementary education (PreK-6) is designed for individuals with a non-teaching B.S. or B. A. degree, or for those with a teaching license in another teaching area, who want to obtain licensure to teach in grade Pre-K through grade six.

Admission

All students must apply for and be admitted into the approved post-baccalaureate endorsement program for Elementary Education (grades PreK-6). The following admission criteria must be met:

1. A bachelor's degree from a regionally accredited college/university is required in the liberal arts and sciences (or equivalent) including specific course work to meet Virginia's stated coursework competencies for elementary education (PreK-6) subject area preparation.
2. Students must meet the required criteria for admission by passing the Virginia Board of Education prescribed assessments and earning the minimum required grade point averages (GPA). Virginia Board of Education prescribed entry assessments are outlined in the Teacher Education Services and Advising section of the catalog. Virginia Board of Education prescribed assessments:
 - A passing Praxis I composite score of 532 by December 31, 2013 or
 - Passing Praxis Core section scores (Reading Score of 156, Writing Score of 162, and Math Score of 150) beginning January 1, 2014 or
 - Qualifying SAT or ACT test scores or
 - Praxis I Math test score of 178 and a composite Virginia Communication and Literacy (VCLA) score of 470 by December 31, 2013 or
 - Praxis Core Math test score of 150 and a composite Virginia Communication and Literacy (VCLA) score of 470 beginning January 1, 2014 or
 - SAT Mathematics test score of 530 and a composite Virginia Communication and Literacy (VCLA) score of 470 or
 - ACT Mathematics test score of 22 and a composite Virginia Communication and Literacy (VCLA) score of 470

*To review more information on the Virginia Board of Education prescribed assessments visit the Teacher Education Services website, <http://www.odu.edu/tes>.

3. Cumulative undergraduate GPA of 2.75 is required for admission.
4. No courses in the academic major or professional education in which the student has made below a "C" will be accepted in the Darden College of Education.
5. An application for non-degree admission must be submitted by the appropriate deadline for admission. Under certain circumstances, applicants who do not fully meet the requirements for regular admission to the program may be admitted on a provisional basis subject to

conditions specified by the graduate program director for elementary/middle education.

Continuance

1. Students must maintain a cumulative Graduate GPA of 3.00. A grade of "B" or higher is required in all practicum coursework.
2. A grade of "C" or higher is required in all content knowledge and professional education courses.
3. Students must complete the Responsible Conduct of Research (RCR) modules during the first twelve graduate credit hours at Old Dominion University. For more information review the instructions at: <http://www.odu.edu/education/resources/conduct-of-research-instructions>.
4. Students must take and pass all Virginia Board of Education prescribed assessments including the Reading for Virginia Educators (RVE) coded 0306 paper delivered or 5306 computer delivered, the Virginia Communication and Literacy Assessment (VCLA), and the Praxis II code 5031 computer delivered, prior to or while enrolled in the Seminar in Teacher Education (TLED 583) course.
5. All assessments must be passed prior to the start of the Teacher Candidate Internship Orientation session.
6. A criminal background check must be completed prior to placement in a field experience required for practicum courses and for the teacher candidate internship. For more information please review the policy in the Teacher Education Services website: <http://www.odu.edu/tes>.

To review more information on the Virginia Board of Education prescribed professional assessments visit the Teacher Education Services website, <http://www.odu.edu/tes>.

Exit

Requirements for completion are:

1. A minimum cumulative 3.00 Graduate GPA
2. Successful completion of the Teacher Candidate Internship
3. Complete all course requirements
4. Submit an application for Virginia licensure.
5. No courses in the academic major or professional education in which the student earned below a "C" will be accepted toward licensure requirements in the Darden College of Education.

Program Requirements

Students seeking initial licensure for grades PreK-6 must meet the academic concentration requirements with a minimum grade of "C". Transcripts will be evaluated by the education advisor to determine whether these academic requirements have been met by previous course work. Subject area specific course work that was not met in previous course work must be completed prior to Teacher Candidate Internship (student teaching) orientation session.

Curriculum

Prerequisite Courses

12

TLED 301	Foundations and Introduction to Assessment of Education
TLED 430/530	PK-12 Instructional Technology
SPED 313	Fundamentals of Human Growth and Development: Birth through Adolescence
TLED 468/568	Language Acquisition and Reading for Students with Diverse Learning Needs

Graduate Professional Education Courses

28

SPED 406/506	Students with Diverse Learning Needs in the General Education Classroom
TLED 432/532	Developing Instructional Strategies PreK-6: Language Arts
STEM 433/533	Developing Instructional Strategies PreK-6: Mathematics

STEM 434/534	Developing Instructional Strategies PreK-6: Science
TLED 435/535	Developing Instructional Strategies PreK-6: Social Studies
READ 680	Reading to Learn Across the Curriculum
TLED 583	Seminar in Teacher Education
TLED 679	Advanced Classroom Management and Practicum in PreK-6
TLED 669	Internship/Student Teaching and Seminar
Total Hours	40

Due to changing University requirements, national standards, and the Virginia Board of Education licensure regulations, the programs in the Darden College of Education are under constant revision. Any changes resulting from these factors supersede the program requirements described in this Catalog. Students are encouraged to obtain current program information from their advisors and from the Teacher Education Services website: <http://www.odu.edu/tes>.

Master of Science in Education, Elementary Education, Middle School, 6-8, Initial Licensure

Charlene Fleener, Graduate Program Director

Nola Nicholson, Advisor

This master's program in elementary education with a concentration in middle school education (grades 6-8) is designed for prospective teachers wanting to obtain initial middle school teaching licensure and a master's degree at the same time. Available to students who have a non-teaching B.S. or B.A. degree, the program requires students to take courses that meet the Commonwealth of Virginia's stated academic competency requirements and leads to two undergraduate endorsement areas selected from the following:

Mathematics *	21
English *	21
Science *	21
Social Studies *	21
Education Courses taken at the graduate level	33

* Minimum hours to satisfy requirement.

Advisors in the Office of Teacher Education Services will evaluate an individual's undergraduate transcript to determine which, if any, undergraduate academic content courses are needed to meet state requirements for licensure. No courses in the academic major or professional education classes in which the student has made below a C- will be accepted toward licensure in the Darden College of Education. The Middle School initial licensure concentration offers two different emphasis areas: Campus-based and Military Career Transition (MCTP). Please see the Military Career Transition (MCTP) section for a full description of the requirements for this emphasis area.

Admission

All students must apply for and be admitted into the approved M.S. Ed with initial licensure program for Middle School (grades 6-8). Admission criteria for the Military Career Transition (MCTP) emphasis area can be found in the Military Career Transition section. The following criteria must be met for admission to the Campus-based emphasis area:

1. A bachelor's degree from a regionally accredited college/university is required in the liberal arts and sciences (or equivalent) including 21 semester hours (which meet Virginia's stated coursework competencies) in two content areas (English, mathematics, science, and history/social studies) which will be listed on the license.

2. Students must meet the required criteria for admission by passing the Virginia Board of Education prescribed assessments and earning the minimum required Grade point averages (GPA).

Virginia Board of Education prescribed entry assessments are outlined in the Teacher Education Services and Advising section of this catalog.

- A passing PRAXIS I composite score of 532 by December 31, 2013 or
- Passing Praxis Core section scores (Reading Score of 156, Writing Score of 162, and Math Score of 150) beginning January 1, 2014
- Qualifying SAT or ACT test scores or
- PRAXIS I Math test score of 178 and a composite Virginia Communication and Literacy (VCLA) score of 470 by December 31, 2013 or
- Praxis Core Math test score of 150 and a composite Virginia Communication and Literacy (VCLA) score of 470 beginning January 1, 2014 or
- SAT Mathematics test score of 530 and a composite Virginia Communication and Literacy (VCLA) score of 470 or
- ACT Mathematics test score of 22 and a composite Virginia Communication and Literacy (VCLA) score of 470

To review more information on the Virginia Board of Education prescribed assessments visit the Teacher Education Services website, <http://www.odu.edu/tes>.

3. A cumulative undergraduate GPA of 2.80 is required for admission.
4. No courses in the academic major or professional education in which the student has made below a "C" will be accepted for admission in the Darden College of Education.
5. Satisfactory scores must be submitted on either the Graduate Record Examination or Miller Analogies Test.
6. An application for graduate studies and official transcripts must be submitted by the appropriate deadline for admission. Under certain circumstances, applicants who do not fully meet the requirements for regular admission to the program may be admitted on a provisional basis subject to conditions specified by the graduate program director for elementary/middle education.

Continuance

1. Students must maintain a cumulative GPA of 3.00 and a minimum of 3.00 GPA in the major. A grade of "B" or higher is required in all practicum coursework. A minimum "B-" grade is required for all graduate professional education courses.
2. Students must complete the Responsible Conduct of Research (RCR) modules during the first twelve graduate credit hours at Old Dominion University. For more information review the instructions at: <http://www.odu.edu/education/resources/conduct-of-research-instructions>.
3. Students must take and pass the Virginia Communication and Literacy Assessment (VCLA) and the PRAXIS II examination for the appropriate Middle School content area prior to or while enrolled in the instructional strategies course. All assessments must be passed prior to the start of the Teacher Candidate Internship Orientation session.
4. A criminal background check must be completed prior to placement in a field experience required for practicum courses and for the teacher candidate internship. For more information please review the policy in the Teacher Education Services website: <http://www.odu.edu/tes>.

Virginia Board of Education prescribed professional assessments:

- **Virginia Communication and Literacy Assessment (VCLA)** – a passing composite score of 470 is required on this reading and writing assessment
- **PRAXIS II Middle School English/Language Arts (test code: 0049 or 5049)** – passing score of 164 by December 31, 2013 or
- **PRAXIS II Middle School English/Language Arts (test code: 5047, computer only)** -passing score of 164 starting January 1, 2014

- **PRAXIS II Middle School Mathematics (test code: 0069)** – passing score of 163 by December 31, 2013 or
- **PRAXIS II Middle School Mathematics (test code: 5169, computer only)** - passing score of 165 starting January 1, 2014
- **PRAXIS II Middle School Science (test code: 0439)** – passing score of 162
- **PRAXIS II Middle School Social Studies (test code: 0089 or 5089)** – passing score of 160

To review more information on the Virginia Board of Education prescribed assessments visit the Teacher Education Services website, <http://www.odu.edu/tes>.

Exit

Requirements for graduation include the following:

1. passage of the written Comprehensive exam,
2. completion of the Graduate Assessment,
3. a minimum cumulative 3.00 GPA, with a minimum B- grade for all graduate professional education courses required,
4. successful completion of the Teacher Candidate Internship,
5. an exit interview,
6. completion of all course requirements, and
7. submission of an application for graduation.

No courses in the academic major or professional education in which the student earned below a "C-" will be accepted toward licensure requirements in the Darden College of Education.

Program Requirements

Students seeking initial licensure plus a master's degree in elementary education with a concentration in middle school education (grades 6-8) must meet the academic concentration requirements in two of the following content areas with a minimum grade of "C". Transcripts will be evaluated by the education advisor to determine whether the academic requirements have been met by previous course work. Experiential learning credit may be available for some non-academic work.

English: English content must include coursework in language (history, structure or grammar), literature, advanced composition, and interpersonal communication or speech; 21 credit hours.

Mathematics: Mathematics content must include coursework in algebra, geometry, probability and statistics, and applications of mathematics; 21 credit hours.

Science: Science content must include courses in each of the following: biology, chemistry, physics, and earth and space science (a laboratory course is required in two of the four science areas); 21 credit hours.

History/Social science: History/social science content must include courses in American History, world history, economics, geography, international affairs, and current events; 21 credit hours.

All students, regardless of which two content areas selected, are required to take a Government/Civics course or complete the state and local civic education module.

Prerequisite Courses 12

TLED 301	Foundations and Introduction to Assessment of Education
TLED 430/530	PK-12 Instructional Technology
SPED 313	Fundamentals of Human Growth and Development: Birth through Adolescence
TLED 468/568	Language Acquisition and Reading for Students with Diverse Learning Needs

Graduate Professional Education Courses 32

SPED 506	Students with Diverse Learning Needs in the General Education Classroom
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TLED 583	Seminar in Teacher Education (co-requisite with one Instructional strategies)
TLED 615	Teaching in the Middle School
READ 680	Reading to Learn Across the Curriculum
LIBS 642	Children's Literature Across the Curriculum, PK-8
FOUN 641	Assessment and Evaluation of Student Learning
TLED 666	Internship/Student Teaching and Seminar (student teaching)
Select two from the following:	
TLED 551	Developing Instructional Strategies for Teaching in the Middle/High School: English
TLED 555	Developing Instructional Strategies for Teaching in the Middle/High School: Social Studies
STEM 553	Developing Instructional Strategies for Teaching in the Middle/High School: Mathematics
STEM 554	Developing Instructional Strategies for Teaching in the Middle/High School: Science

Total Hours 44

Due to changing University requirements, national standards, and the Virginia Board of Education licensure regulations, the programs in the Darden College of Education are under constant revision. Any changes resulting from these factors supersede the program requirements described in this Catalog. Students are encouraged to obtain current program information from their advisors and from the Teacher Education Services website: <http://www.odu.edu/tes>.

Elementary Education, Middle School, 6-8, Post-baccalaureate Endorsement

Charlene Fleener, Graduate Program Director

Nola Nicholson, Advisor

This Post-baccalaureate Endorsement program in elementary education with a middle school concentration (grades 6-8) is designed for prospective teachers who want to obtain an initial middle school teaching license. Available to students who have a non-teaching B.S. or B.A. degree or to those having a teaching license in another area and are seeking an additional teaching license; the program requires students to take courses that meet the Commonwealth of Virginia's stated academic competency requirements and leads to two undergraduate endorsement areas selected from the following:

Mathematics *	21
English *	21
Science *	21
Social Studies *	21
Education Courses taken at the graduate level	21-23

* Minimum hours to satisfy requirement.

*Advisors in the Office of Teacher Education Services will evaluate an individual's undergraduate transcript to determine which, if any, undergraduate academic content courses are needed to meet state requirements for licensure. No courses in the academic major classes in which the student has made below a C will be accepted toward licensure in the Darden College of Education.

Admission

All students must apply for and be admitted into the approved post-baccalaureate endorsement program for Elementary/Middle School Education (grades 6-8). The following criteria must be met:

1. A bachelor's degree from a regionally accredited college/university is required in the liberal arts and sciences (or equivalent) to meet Virginia's stated coursework competencies for middle school education (6-8) subject areas, including 21 semester hours (which meet Virginia's stated coursework competencies) in two content areas (English, mathematics, science, and history/social studies) which will be listed on the license.
2. Students must meet the required criteria for admission by passing the Virginia Board of Education prescribed assessments and earning the minimum required Grade point averages (GPA).

Virginia Board of Education prescribed entry assessments are outlined in the Teacher Education Services and Advising section of this catalog.

- A passing PRAXIS I composite score of 532 by December 31, 2013 or
- Passing Praxis Core section scores (Reading score of 156, Writing score of 162, and Math Score of 150) beginning January 1, 2014 or
- Qualifying SAT or ACT test scores or
- PRAXIS I Math test score of 178 and a composite Virginia Communication and Literacy (VCLA) score of 470 by December 31, 2013 or
- Praxis Core Math test score of 150 and a composite Virginia Communication and Literacy (VCLA) score of 470 beginning January 1, 2014
- SAT Mathematics test score of 530 and a composite Virginia Communication and Literacy (VCLA) score of 470 or
- ACT Mathematics test score of 22 and a composite Virginia Communication and Literacy (VCLA) score of 470

To review more information on the Virginia Board of Education prescribed assessments visit the Teacher Education Services website, <http://www.odu.edu/tes>.

3. A cumulative undergraduate GPA of 2.75 is required for admission.
4. No courses in the academic major or professional education in which the student has made below a C- will be accepted for admission in the Darden College of Education.
5. An application for non-degree admission must be submitted by the appropriate deadline for admission. Under certain circumstances, applicants who do not fully meet the requirements for regular admission to the program may be admitted on a provisional basis subject to conditions specified by the graduate program director for elementary/middle education.

Continuance

1. Students must maintain a cumulative GPA of 2.75 and a minimum of 2.75 GPA in the major.
2. A grade of "B" or higher is required in all practicum coursework. A grade of "B-" is required for all graduate professional education courses.
3. Students must complete the Responsible Conduct of Research (RCR) modules during the first twelve graduate credit hours at Old Dominion University. For more information review the instructions at:<http://www.odu.edu/education/resources/conduct-of-research-instructions>.
4. Students must take and pass the Virginia Communication and Literacy Assessment (VCLA) and the PRAXIS II examination for the appropriate Middle School content area prior to or while enrolled in the instructional strategies course.
5. All assessments must be passed prior to the start of the Teacher Candidate Internship Orientation session.
6. A criminal background check must be completed prior to placement in a field experience required for practicum courses and for the teacher candidate internship. For more information please review the policy in the Teacher Education Services website: <http://www.odu.edu/tes>.

Virginia Board of Education prescribed professional assessments:

- **Virginia Communication and Literacy Assessment (VCLA)** – a passing composite score of 470 is required on this reading and writing assessment
- **PRAXIS II Middle School English/Language Arts (test code: 0049 or 5049)** – passing score of 164 by December 31, 2014 or
- **PRAXIS II Middle School English/Language Arts (test code: 5047 computer only)** - passing score of 164 starting January 1, 2014
- **PRAXIS II Middle School Mathematics (test code: 0069)** – passing score of 163 by December 31, 2013 or
- **PRAXIS II Middle School Mathematics (test code: 5069 computer only)** -passing score of 165 starting January 1, 2014
- **PRAXIS II Middle School Science (test code: 0439)** – passing score of 162
- **PRAXIS II Middle School Social Studies (test code: 0089 or 5089)** – passing score of 160

To review more information on the Virginia Board of Education prescribed assessments visit the Teacher Education Services website, <http://www.odu.edu/tes>.

Exit

Requirements for completion are as follows:

1. a minimum cumulative 2.75 GPA,
2. a minimum grade of "C" in all academic major courses to be accepted toward licensure requirements in the Darden College of Education,
3. successful completion of the Teacher Candidate Internship,
4. completion of all course requirements, and
5. submission of an application for Virginia licensure.

Program Requirements

Students seeking initial licensure for grades 6 - 8 must meet the academic concentration requirements in two of the following content areas with a minimum grade of "C". Transcripts will be evaluated by the education advisor to determine whether the academic requirements have been met by previous course work. Subject area specific course work that was not met in previous course work must be completed prior to Teacher Candidate Internship (student teaching) orientation session.

English: English content must include coursework in language (history, structure or grammar), literature, advanced composition, and interpersonal communication or speech; 21 credit hours.

Mathematics: Mathematics content must include coursework in algebra, geometry, probability and statistics, and applications of mathematics; 21 credit hours.

Science: Science content must include courses in each of the following: biology, chemistry, physics, and earth and space science (a laboratory course is required in two of the four science areas); 21 credit hours.

History/Social science: History/social science content must include courses in American History, world history, economics, geography, international affairs, and current events; 21 credit hours.

All students, regardless of which two content areas selected, are required to take a Government/Civics course

Prerequisite Courses		1
TLED 301	Foundations and Introduction to Assessment of Education	3
TLED 430/530	PK-12 Instructional Technology	3
SPED 313	Fundamentals of Human Growth and Development: Birth through Adolescence	3
TLED 468/568	Language Acquisition and Reading for Students with Diverse Learning Needs	3
Graduate Professional Education Courses		
READ 680	Reading to Learn Across the Curriculum	3
TLED 583	Seminar in Teacher Education	1

TLED 615	Teaching in the Middle School	4
Select two from the following:		6
TLED 551	Developing Instructional Strategies for Teaching in the Middle/High School: English	
TLED 555	Developing Instructional Strategies for Teaching in the Middle/High School: Social Studies	
STEM 553	Developing Instructional Strategies for Teaching in the Middle/High School: Mathematics	
STEM 554	Developing Instructional Strategies for Teaching in the Middle/High School: Science	
TLED 666	Internship/Student Teaching and Seminar	9
Total Hours		36

Due to changing University requirements, national standards, and the Virginia Board of Education licensure regulations, the programs in the Darden College of Education are under constant revision. Any changes resulting from these factors supersede the program requirements described in this Catalog. Students are encouraged to obtain current program information from their advisors and from the Teacher Education Services website: <http://www.odu.edu/tes>.

Master of Science in Education, Elementary Education, Licensed Teachers

145 Education Building
757-683-3284

Charlene Fleener, Graduate Program Director (Campus-based Option)

Robert Lucking, Graduate Program Director (Field-based Option)

The Master of Science in Education Elementary Education program for licensed teachers is designed for those who wish to enter a degree program that will enhance and enrich their teaching expertise for becoming master teachers. Two emphasis areas are offered, campus-based and field-based. The campus-based option is a traditional ODU main campus offering. The program of study includes research and a selection of graduate courses that complement the current and/or desired professional focus of the candidate. The field-based option offers licensed teachers and other professional educators the opportunity to earn a master's degree at one of several on-site school locations throughout the Commonwealth. Registration is restricted to licensed educators at the designated public or independent schools. Classes typically are held within the community, and research and instruction is focused on each school's curriculum, student body, and instructional offerings. While the degree programs and requirements mirror on-campus programs, minor curricular variations may occur. Non-degree students intending to enter this graduate program must meet with the graduate program director upon completion of no more than six graduate credits. Licensed teachers seeking an elementary education masters degree with a concentration in Library Science should see the Library Science (School Librarianship K-12) section for complete program information. Licensed teachers seeking an elementary education masters degree (K-8) with a Mathematics Specialist concentration should see that section in the Science, Technology, Engineering, Mathematics, and Professional Studies (STEMPS) Department.

The graduate program associated with this major is intended to meet the needs of the individual student. Program options are designed to accomplish three primary goals:

1. to enhance classroom instruction by enriching the knowledge and skills of practicing teachers;
2. to train and encourage classroom teachers to conduct in-school research so that significant findings in the learning-teaching process can be applied to the classroom situation; and
3. to permit teachers to upgrade their teaching credentials to the Postgraduate Professional License level.

Curricula for the program include specific courses in teaching in most of the major content areas: mathematics, science, social studies, and language arts. Each individualized program has three component areas:

1. core,
2. support; and
3. research.

The research component may have up to three options (thesis, problem paper, or seminar) as indicated.

Admission

Students must:

1. hold a bachelor's degree from a regionally accredited college/university;
2. hold at least the Virginia Collegiate Professional License or an equivalent license from another state for elementary or middle school education;
3. have a general undergraduate grade point average of at least 2.80;
4. take and receive satisfactory scores on either the Graduate Record Examination or Miller Analogies Test;
5. have an interview with the graduate program director; and
6. apply for admission to graduate school; and
7. send official copies of all transcripts to Graduate Admissions.

Performance in classes taken as a non-degree student will not be taken into consideration in the admission process. Under certain circumstances, applicants who do not fully meet the requirements for regular admission to the program may be admitted on a provisional basis subject to conditions specified by the graduate program director for elementary/middle education.

Continuance

Students must:

1. complete the Responsible Conduct of Research (RCR) modules during the first twelve graduate credit hours at Old Dominion University. For more information review the instructions at: <http://www.odu.edu/education/resources/conduct-of-research-instructions>
2. maintain a grade point average of 3.00; and
3. maintain a grade point average of 3.00 in the major.

Exit

Students must:

1. have a 3.00 grade point average;
2. have a 3.00 grade point average in the major;
3. pass a written comprehensive examination;
4. have an exit interview;
5. have completed all course requirements; and
6. submit an application for graduation.

Program Requirements

Since students are expected to be dedicated to the goal of becoming master teachers, evidence that a student has reached this goal must be presented before graduation is certified. A minimum of 30 semester credits of course work is required for programs in elementary/middle school education. After admission to provisional or regular degree status, or before the completion of six credits as a non-degree student, the student must meet with the graduate program director who will assign a permanent advisor from the graduate faculty of the Darden College of Education. It is the responsibility of the student to confer with the assigned advisor for the purpose of developing a program of study. Each program has a core, support and research area that may, in some instances, be tailored to fit individual needs. Listed below is a possible program of study.

General Core

TLED 430/530 PK-12 Instructional Technology*

12

READ 683 Diagnostic Teaching of Reading in the Classroom

Instructional Strategies classes or other courses based on teaching specialities	6
Support beyond the core **	12
Research courses (6 to 12 Credits)	7-13
Select one option from the following:	
Option A, Thesis option ***	
FOUN 612 Applied Research Methods in Education	
TLED 698 Thesis	
FOUN 722 Introduction to Applied Statistics and Data Analysis	
Option B, Problem paper option ****	
FOUN 612 Applied Research Methods in Education	
TLED 636 Problems in Education	
+	
Total Hours	37-43

- * Taken within five years or waived through examination.
 ** Classes to be selected in consultation with the student's advisor or program director.
 *** 9-12 credits; 33 credits required for graduation.
 **** 6 credits; 30 credits required for graduation.
 + 12 credits; 36 credits required for graduation.
 ++ 6 credit hours of electives.

Secondary Education

145 Education Building
757-683-3284

Robert Lucking, Graduate Program Director

Nola Nicholson, Advisor

General Description of Secondary Education

Secondary programs include the Master of Science in Education degree program and three Post-baccalaureate licensure programs. Within the Master of Science in secondary education degree program there are a number of concentrations and emphasis area choices for both licensed teachers as well as those seeking initial licensure or endorsement. For those seeking initial licensure there are the following concentration areas: 6-12, library science K-12 (Note: the library science concentration may also be done through Master of Science in Education - Elementary), and Teachers of English to Speakers of Other Languages K-12 (TESOL). For licensed teachers seeking additional education there are the following concentration areas: 6-12 and library science K-12 (Note: the library science concentration may also be done through Master of Science in Education - Elementary). Post-baccalaureate endorsement programs are designed for individuals with a non-teaching B.S. or B. A. degree who want to obtain licensure, or for those with a teaching license who want to be licensed in an additional teaching area. The three endorsement programs offered in secondary education are 6-12, Library Science K-12, and Teachers of English to Speakers of Other Languages K-12 (TESOL). Please note that there are secondary programs for earning a bachelor's degree with initial licensure in grades 6-12 described in the ODU Undergraduate Catalog.

Master of Science in Education, Secondary Education, 6-12, Initial Licensure

This master's program in secondary education (grades 6-12) with initial licensure is designed for individuals with a non-teaching B.S. or B. A. degree who want to obtain licensure as a teacher in grades 6 through 12 and earn a master's degree at the same time. The 6-12 initial licensure concentration offers two different emphasis areas: Campus-based and Military Career Transition (MCTP). See the Military Career Transition (MCTP) section for complete program information. For those seeking initial

licensure in the area of library science see the Library Science (School Librarianship K-12) section for complete program information.

Admission

All students must apply for and be admitted into the approved M.S. Ed with initial licensure program for Secondary Education (grades 6-12). Please note that admission criteria for the Military Career Transition (MCTP) emphasis area can be found in the Military Career Transition section. For admission to the Campus-based emphasis area the following criteria must be met:

1. A bachelor's degree from a regionally accredited college/university is required in the liberal arts and sciences (or equivalent). The degree must include semester hours (which meet Virginia's stated coursework competencies) in one of the following content areas: English, mathematics, earth science, chemistry, biology, or physics, and history/social studies, which will be listed on the license.
2. Students must meet the required criteria for admission by passing the Virginia Board of Education prescribed assessments and earning the minimum required grade point averages (GPA).

Virginia Board of Education prescribed entry assessments are outlined in the Teacher Education Services and Advising section of this catalog.

Virginia Board of Education prescribed assessments:

- A passing PRAXIS I composite score of 532 by December 31, 2013 or
- Passing Praxis Core section scores (Reading score of 156, Writing score of 162, and Math score of 150) beginning January 1, 2014 or
- Qualifying SAT or ACT test scores or
- PRAXIS I Math test score of 178 and a composite Virginia Communication and Literacy (VCLA) score of 470 by December 31, 2013 or
- Praxis Core Math test score of 150 and a composite Virginia Communication and Literacy (VCLA) score of 470 beginning January 1, 2014 or
- SAT Mathematics test score of 530 and a composite Virginia Communication and Literacy (VCLA) score of 470 or
- ACT Mathematics test score of 22 and a composite Virginia Communication and Literacy (VCLA) score of 470

To review more information on the Virginia Board of Education prescribed assessments visit the Teacher Education Services website, <http://www.odu.edu/tes>.

3. A cumulative undergraduate GPA of 2.80 is required for admission.
4. Only courses that meet the grade required for the academic major or professional education will be accepted for admission in the Darden College of Education.
5. Satisfactory scores must be submitted on either the Graduate Record Examination or Miller Analogies Test.
6. An application for graduate studies and official transcripts must be submitted by the appropriate deadline for admission. Under certain circumstances, applicants who do not fully meet the requirements for regular admission to the program may be admitted on a provisional basis subject to conditions specified by the graduate program director for secondary education.

Continuance

1. Students must complete the Responsible Conduct of Research (RCR) modules during the first twelve graduate credit hours at Old Dominion University. For more information review the instructions at: <http://www.odu.edu/education/resources/conduct-of-research-instructions>
2. Students must maintain a cumulative GPA of 3.00 with a minimum grade requirement of "B-" for all graduate professional education courses.
3. Students must take and pass the Virginia Communication and Literacy Assessment (VCLA) and the PRAXIS II examination for the appropriate

specialty area prior to or while enrolled in the instructional strategies course.

- All assessments must be passed prior to the start of the Teacher Candidate Internship Orientation session. A criminal background check must be completed prior to placement in a field experience required for practicum courses and for the teacher candidate internship. For more information please review the policy in the Teacher Education Services website: <http://www.odu.edu/tes>.

To review more information on the Virginia Board of Education prescribed professional assessments visit the Teacher Education Services and Advising catalog section or website, <http://www.odu.edu/tes>.

Exit

Requirements for graduation include the following:

- passage of the written Comprehensive exam,
- completion of the Graduate Assessment,
- a minimum cumulative 3.00 GPA, with a minimum grade requirement of "B-" for all graduate professional education courses.
- successful completion of the Teacher Candidate Internship,
- an exit interview,
- completion of all course requirements, and
- submission of an application for graduation.

Only courses that meet the grade required for the academic major or professional education will be accepted toward licensure requirements in the Darden College of Education.

Program Requirements

Students seeking initial licensure plus a master's degree in secondary education (grades 6-12) must meet the grade required for the academic major and professional education in order to complete the master's degree. Transcripts will be evaluated by the education advisor to determine whether the academic requirements have been met by previous course work. Subject area specific course work (content) that was not met in previous course work must be completed prior to Teacher Candidate Internship (student teaching) orientation session. Experiential learning credit may be available for some non-academic work.

Curriculum

Program Prerequisite		3
SPED 313	Fundamentals of Human Growth and Development: Birth through Adolescence	
Graduate Professional Education courses		34
TLED 530	PK-12 Instructional Technology	
TLED 608	Foundations of Education and Instructional Assessment	
SPED 500	Foundations of Special Education: Legal Aspects and Characteristics	
TLED 640	The Management of Learning and Instruction	
READ 680	Reading to Learn Across the Curriculum	
SPED 517	Collaboration and Transitions	
TLED 583	Seminar in Teacher Education (co-requisite with Instructional Strategies)	
FOUN 641	Assessment and Evaluation of Student Learning	
TLED 669	Internship/Student Teaching and Seminar	
Select one of the following four that corresponds to subject (content) area:		3
TLED 551	Developing Instructional Strategies for Teaching in the Middle/High School: English	
TLED 555	Developing Instructional Strategies for Teaching in the Middle/High School: Social Studies	

STEM 553	Developing Instructional Strategies for Teaching in the Middle/High School: Mathematics	
STEM 554	Developing Instructional Strategies for Teaching in the Middle/High School: Science	
Total Hours		40

Due to changing University requirements, national standards, and the Virginia Board of Education licensure regulations, the programs in the Darden College of Education are under constant revision. Any changes resulting from these factors supersede the program requirements described in this Catalog. Students are encouraged to obtain current program information from their advisors and from the Teacher Education Services website: <http://www.odu.edu/tes>.

Master of Science in Education, Secondary, Licensed Teachers

The graduate programs for licensed teachers in secondary education are designed to improve and update their professional competency in teaching at the secondary level. Licensed teachers completing the program enhance their ability to teach effectively and to participate in educational research in their schools. Completion of requirements leads to the upgrade of the teaching license to the Postgraduate Professional level. The Master of Science in Education Secondary degree for Licensed Teachers may be earned through a campus-based or field-based option. The campus-based option is a traditional ODU main campus offering. The program of study includes research and a selection of graduate courses that complement the current and/or desired professional focus of the candidate. The field-based option offers licensed teachers and other professional educators the opportunity to earn a master's degree at one of several on-site school locations throughout the Commonwealth. Registration is restricted to licensed educators at the designated public or independent schools. Classes typically are held within the community, and research and instruction is focused on each school's curriculum, student body, and instructional offerings. While the degree programs and requirements mirror on-campus programs, minor curricular variations may occur. The masters degree for licensed teachers with a Library Science concentration may be obtained in this program [See Library Science (School Librarianship K-12) separate listing.] Non-degree students intending to enter this graduate program must meet with the secondary education graduate program director upon completion of no more than six graduate credits.

Program: General for Licensed Teachers

The general secondary education major for licensed teachers includes interest areas in instructional design and technology, general vocational education, and library science/media. The program in school librarianship is listed in a separate section. Other programs may be individually designed as students' needs indicate.

Admission

Students must:

- hold a bachelor's degree from a regionally accredited college/university;
- hold the Virginia Collegiate Professional License or an equivalent license from another state preferably in secondary education;
- have a cumulative grade point average of 2.80;
- achieve a satisfactory score on the Graduate Record Examination or Miller Analogies Test;
- have an interview with faculty in the program; and
- submit an application for admission.

Performance in classes taken as a non-degree student will not be taken into consideration in the admission process. Under certain circumstances, applicants who do not fully meet the requirements for regular admission to the program may be admitted on a provisional basis subject to conditions specified by the graduate program director for secondary education.

Continuance

Students must:

1. complete the Responsible Conduct of Research (RCR) modules during the first twelve graduate credit hours at Old Dominion University. For more information review the instructions at: <http://www.odu.edu/education/resources/conduct-of-research-instructions>.
2. maintain a grade point average of 3.00, and
3. maintain a grade point average of 3.00 in the major.

Exit

Students must:

1. have a 3.00 grade point average;
2. have a 3.00 grade point average in the major;
3. pass a written comprehensive examination;
4. have an exit interview;
5. have completed all course requirements; and
6. apply for graduation.

Program Requirements

Students enrolled in secondary and general secondary programs are expected to be dedicated to the goal of becoming master classroom teachers or librarians; therefore, evidence that a student has reached this goal must be presented before graduation is certified. A minimum of 31 semester credits is required for completion of any program planned. If a graduate student elects to add other goals to the program, such as becoming a secondary education supervisor, then the program may require an additional nine to 12 credits beyond the 31-hour minimum.

Emphasis Areas

In the secondary school - general program, emphases are offered in biology, chemistry, English, mathematics, economics, history, and social studies education. For requirements in the music education interest area, refer to the Music section in the College of Arts and Letters. For library science/media refer to the separate section listed later in the department.

Area I: Core: 12 to 18 credits.

Area II: Support: 12 to 18 credits.

Area III: Research: 6 to 12 credits. The following two courses are required:

FOUN 612	Applied Research Methods in Education	3
TLED 636	Problems in Education	3

After admission to provisional or regular degree status, each student is assigned a permanent advisor from the Darden College of Education's graduate faculty. It is the student's responsibility to confer with the assigned advisor. The advisor will be well acquainted with the emphasis area the student has chosen and will be responsible for helping the student develop a program of study that best meets the student's needs. This proposed program of study becomes the student's graduate program upon approval of the graduate program director, and can be changed only with the advice and consent of both the faculty advisor and the student. Because of the individualized nature of graduate programs in secondary education, good working relationships between faculty advisors and students are essential.

Graduate programs in the vocational secondary education major are administered by the Departments of Teaching & Learning and Science, Technology, Engineering, and Mathematics (STEM).

Secondary Education, 6-12, Post-Baccalaureate Endorsement

This Post-Baccalaureate endorsement program in secondary education (grades 6-12) is designed for individuals with a non-teaching B.S. or B. A. degree who want to obtain licensure as a teacher in grades 6 through 12 in the following content areas: English, mathematics, earth science, chemistry,

biology or physics, and history/social studies, which will be listed on the license.

Admission

1. All students must apply for and be admitted into the approved post-baccalaureate endorsement program for Secondary Education (grades 6-12).
2. Students must meet the required criteria for admission by passing the Virginia Board of Education prescribed assessments and earning the minimum required Grade point averages (GPA).

Virginia Board of Education prescribed entry assessments are outlined in the Teacher Education Services and Advising section of this catalog.

Virginia Board of Education prescribed assessments:

- A passing PRAXIS I composite score of 532 by December 31, 2013 or
- Passing Praxis Core section scores (Reading score of 156, Writing score of 162, and Math score of 150) beginning January 1, 2014 or
- Qualifying SAT or ACT test scores or
- PRAXIS I Math test score of 178 and a composite Virginia Communication and Literacy (VCLA) score of 470 by December 31, 2013 or
- Praxis Core Math test score of 150 and a composite Virginia Communication and Literacy (VCLA) score of 470 beginning January 1, 2014 or
- SAT Mathematics test score of 530 and a composite Virginia Communication and Literacy (VCLA) score of 470 or
- ACT Mathematics test score of 22 and a composite Virginia Communication and Literacy (VCLA) score of 470

To review more information on the Virginia Board of Education prescribed assessments visit the Teacher Education Services website, <http://www.odu.edu/tes>.

3. A cumulative undergraduate GPA of 2.75 is required for admission.
4. Only courses that meet the grade required in the academic major or professional education will be accepted for admission in the Darden College of Education.
5. An application for non-degree admission must be submitted by the appropriate deadline for admission. Under certain circumstances, applicants who do not fully meet the requirements for regular admission to the program may be admitted on a provisional basis subject to conditions specified by the graduate program director for secondary education.

Continuance

1. Students must complete the Responsible Conduct of Research (RCR) modules during the first twelve graduate credit hours at Old Dominion University. For more information review the instructions at: <http://www.odu.edu/education/resources/conduct-of-research-instructions>.
2. Students must maintain a cumulative GPA of 2.75.
3. A grade of **"B"** or higher is required in all practicum coursework.
4. Students must take and pass all Virginia Board of Education prescribed assessments including the Virginia Communication and Literacy Assessment (VCLA), and the PRAXIS II examination for the appropriate secondary endorsement prior to or while enrolled in the Seminar in Teacher Education (TLED 483 (p. 136)) course.
5. All assessments must be passed prior to the start of the Teacher Candidate Internship Orientation session.

To review more information on the Virginia Board of Education prescribed professional assessments visit the Teacher Education Services website, <http://www.odu.edu/tes>.

Exit

Requirements for completion are as follows:

1. a minimum cumulative 2.75 GPA,
2. successful completion of the Teacher Candidate Internship,
3. completion all course requirements, and
4. submission of an application for Virginia licensure.

Only courses that meet the grade required for the academic major or professional education will be accepted toward licensure requirements in the Darden College of Education.

Program Requirements

Students seeking initial licensure for grades 6 - 12 must meet the grade required for the academic concentration and professional education courses. Transcripts will be evaluated by the education advisor to determine whether the academic requirements have been met by previous course work. Subject area specific course work that was not met in previous course work must be completed prior to Teacher Candidate Internship (student teaching) orientation session.

Military Career Transition Program

152 Education Building
757-683-3348

Arminda Israel, Graduate Program Coordinator

Designed with the needs and interests of military members and their spouse in mind, the Military Career Transition Program (MCTP) offers master's degrees with initial licensure through the Department of Teaching & Learning at Old Dominion University. Upon completion of the Master of Science in Education Degree with Initial Licensure, candidates are eligible to receive the Virginia teaching license. Initial licensure grade levels include elementary education (PreK-6), middle school (6-8), and secondary education (6-12) in the areas of English, mathematics, Earth science, biology, chemistry, physics, and history/social sciences. The master's degree is designed for individuals who have earned a non-teaching bachelor of science or bachelor of arts from a regionally accredited institution. Old Dominion University is a member of the Servicemembers Opportunity Colleges (SOC).

Note to students in Washington State from the Student Achievement Council (SAC) concerning the Master of Science in Education - Military Career Transition Program (Pre-K through 6), the Master of Science in Education - Military Career Transition Program (Middle School), and the Master of Science in Education - Military Career Transition Program (Secondary): Eligibility for initial educator certification in Washington is based on completion of a state approved educator preparation program. This program is approved in Virginia and is authorized for field placements in Washington by the Professional Educators Standards Board. Even though you may be residing in Washington while in this program, your application for educator certification in Washington will be processed as an out-of-state application. Go to <http://pathway.pesb.wa.gov/outofstate> for more information. Teachers are advised to contact their individual school districts as to whether or not this program may qualify for teacher advancement.

Eligible applicants:

- Active duty of all uniformed services
- Active or inactive reservist of all uniformed services
- All National Guard personnel
- All Coast Guard personnel
- Veterans of all uniformed services
- Retired military of all uniformed services
- Spouse of an eligible applicant
- DOD civilian federal employees

Degree courses are offered in traditional classroom at the main campus or via distance education (web- based, video streaming and/or) at locations throughout Virginia and in Bremerton, Washington. MCTP advisors are available at all locations to provide advisement: <http://www.odu.edu/mctp>.

Admission

Regular Admission

1. Must be an eligible applicant as defined by the MCTP Advisory Council policy Eligibility Criteria (<http://education.odu.edu/mctp/admissions.shtml>)
2. Minimum GPA of 2.80 as documented in the Bachelor's degree official transcript from a regionally accredited institution
3. Passing score report for **either Item a) or b)** as described below:
 - a. Praxis Core Academic Skills Educator Tests (<http://www.ets.org/praxis/about/core>) as listed below:

Approved passing scores effective January 1, 2014

Praxis Core Academic Skills for Educators: Reading (5712), a score of 156 or higher

Praxis Core Academic Skills for Educators: Writing (5722), a score of 162 or higher

Praxis Core Academic Skills for Educators: Mathematics (5732), a score of 150 or higher

If taking all three tests together, select Praxis Core Academic Skills tests code 5751

There is NO composite score for the Praxis Core Academic Skills tests.

- b. Praxis I-PPST assessments (<http://www.ets.org/praxis/va/requirements>) completed with a passing score by December 31, 2013 will continue to be valid and accepted for admission into this state-approved teacher education **master's degree**. (*Praxis substitute scores are not applicable.*)

Approved Praxis I scores: Writing 176, Reading 178, Mathematics 178, or Composite Score 532

4. A 500-word Goal Statement addressing "why do you want to be a teacher" and "why do you want to teach the specific subject area or grade level"
5. Resume highlighting a minimum of five years of full time work experience

Provisional Admission Requirements

Provisional admission may be offered to applicants who meet the requirements listed below. Individuals not meeting the conditions below will not be admitted to the program.

1. Must be an eligible applicant as defined by the MCTP Advisory Council policy Eligibility Criteria (<http://education.odu.edu/mctp/admissions.shtml>)
2. GPA of 2.50-2.79 as documented in the Bachelor's degree official transcript from a regionally accredited institution
3. Passing score report for **either item a) or b)** as described below:
 - a. Praxis Core Academic Skills Educator Tests (<http://www.ets.org/praxis/about/core>) as listed below:

Approved passing scores effective January 1, 2014

Praxis Core Academic Skills for Educators: Reading (5712), a score of 156 or higher

Praxis Core Academic Skills for Educators: Writing (5722), a score of 162 or higher

Praxis Core Academic Skills for Educators: Mathematics (5732), a score of 150 or higher

If taking all three tests together, select Praxis Core Academic Skills tests code 5751

There is NO composite score for the Praxis Core Academic Skills tests.

b. Praxis I-PPST assessments (<http://www.ets.org/praxis/va/requirements>) completed with a passing score by December 31, 2013 will continue to be valid and accepted for admission into this state-approved teacher education **master's degree**.
(Praxis substitute scores are not applicable.)

Approved Praxis I scores: Writing 176, Reading 178, Mathematics 178, or Composite Score 532

4. A 500-word Goal Statement addressing “*why do you want to be a teacher*” and “*why do you want to teach the specific subject area or grade level*”

5. Resume highlighting a minimum of five years of full time work experience

Note: Performance as a graduate non-degree student will not be considered when trying to meet the provisional admission requirements.

Gaining Regular Admission after being admitted provisionally:

To gain regular admission, the candidate must earn a minimum 3.00 GPA with no grades below a "B-" in the first 12 graduate credits taken at Old Dominion University after being admitted provisionally. Regular admission must be gained prior to the Teacher Candidate Internship.

Application Procedures:

Eligible applicants must apply for and be admitted into the state-approved M.S.Ed in Elementary Education with initial licensure in grades PreK-6 or grades 6-8 or into the M.S.Ed in Secondary Education with initial licensure in grades 6-12.

Applicants must submit directly to the Office of Graduate Admission the documents listed below:

- A graduate application at: <http://www.odu.edu/admission/graduate>
- In a sealed envelope, official transcript with the bachelor's degree awarded from a regionally accredited institution. Also, in sealed envelopes, submit official transcripts from all other colleges or universities attended. Submit the official transcripts directly to:

Graduate Admission
Old Dominion University
220 Rollins Hall
Norfolk, VA 23529
- Praxis Core Academic Skills score report or Praxis I if a passing score was achieved prior to December 31, 2013 (*upload this document with your electronic application*)
- A 500-word goal statement highlighting “*why do you want to be a teacher*” and “*why do you want to teach the specific subject area or grade level*” (*upload this document with your electronic application*)
- A resume highlighting a minimum of five years of full time work experience. (*upload this document with your electronic application*)

To contact the Office of Graduate Admissions:

E-mail: gradadmit@odu.edu
Hours: M-F, 8:00 am-5:00 pm
Phone: 757-683-3685

Contact the MCTP advisor at your local site: <http://www.odu.edu/mctp> A transcript review will be completed to determine which appropriate courses meet academic content area specified in the M.S.Ed. with initial licensure degree.

Professional Disposition Survey:

Complete this survey after you have enrolled in classes at Old Dominion University. This survey is available on Blackboard. Follow the instructions for completing the Professional Disposition Survey at: <http://www.odu.edu/admission/tep-requirements/undergraduate-tep/survey>.

Responsible Conduct of Research (RCR):

Complete the RCR modules prior to completing your first twelve graduate credit hours of study. For more information, review the instructions at: <http://www.odu.edu/education/resources/conduct-of-research-instructions>.

Continuance

Candidates must:

1. Be in “Good Academic Standing” by maintaining a minimum 3.00 graduate grade point average.
2. Have grades equal to or above a "B-" in all professional education courses accepted toward licensure in the Darden College of Education.
3. Meet the grade required for content knowledge courses in the specific teaching endorsement.
4. Take and pass the prescribed assessment by the Virginia Board of Education:
 - a. Praxis II examination appropriate for your endorsement area
 - b. Virginia Communication and Literacy Assessment (VCLA)
 - c. Reading for Virginia Education (RVE) Assessment, **only** required for elementary education initial licensure.For more information on the Virginia Board of Education prescribed professional assessments visit the Teacher Education Services website, <http://www.odu.edu/tes>.
5. Apply for teacher candidate internship.
6. Complete all courses, professional and content knowledge, with appropriate grade and GPA and achieve a passing score in all assessments required prior to your teacher candidate internship orientation session. A criminal background check must be completed prior to placement for the teacher candidate internship. For more information on the criminal background check please review the policy in the Teacher Education Services website when applying for teacher candidate internship: <http://www.odu.edu/tes>.
7. Complete as needed, “Re-validation of Out-of-Date Graduate Credit” that is beyond the time limit established for graduate degrees. Per University “Graduate Policies and Procedures,” the time limit established is six years for master's degrees. Graduate credit that is beyond the six year limit must be re-validated before the graduate credit can be applied toward the requirements to earn the master's degree. Re-validation must be completed prior to the start of the teacher candidate internship.

Exit

All master's degree requirements must be in accordance with University policy and as outlined in your curriculum. Candidates must:

1. Apply for graduation at: <http://www.odu.edu/academics/graduation-commencement>.
2. Take and pass the Comprehensive Examination.
3. Complete the Graduate Assessment.
4. Have a minimum 3.00 graduate grade point average.
5. Only grades equal to or above a "B-" in professional education courses will be accepted toward licensure requirements in the Darden College of Education.
6. Meet the grade required for content knowledge courses in the specific endorsement and to be accepted toward the licensure requirements in the Darden College of Education.
7. Pass the Teacher Candidate Internship.
8. Have an Exit Interview.
9. Candidates must be registered the semester in which they graduate. If the candidates have completed all registration requirements, they must be registered for at least one credit hour the semester in which they graduate. The academic department has a one credit 998 course that can be used to fulfill this requirement. Registration for this one credit 998 course is subject to the normal fees and regulations of the University.

Program Requirements

Candidates seeking the master's degree with initial licensure through the Military Career Transition Program (MCTP) must meet all requirements outlined in the approved teacher education curriculum for their specific area of endorsement, including the teacher candidate internship. Transcripts will be evaluated by the MCTP Advisor (<http://education.odu.edu/mctp/sitelocations.shtml>) to determine whether these academic requirements have been met with previous course work. Content knowledge course work that is not met with previous course work must be completed prior to the teacher candidate internship orientation session. All MCTP students are required to meet with their advisor at least once per semester. *Candidates are responsible for the information contained in the University Graduate Catalog, such as specific academic policies, course descriptions, and prerequisites:* <http://catalog.odu.edu/>.

Curriculum

The approved teacher education curriculum consists of two components that must be fulfilled to earn the master's degree with initial licensure: 1) content knowledge; and 2) professional education, as listed below:

Content Knowledge

The content knowledge course work required is specified in each initial licensure approved teacher education curriculum the student is pursuing in either elementary education, middle school education or secondary school education. Meet with the MCTP advisor to complete an evaluation and determine the course work needed to fulfill the content knowledge.

Professional Education

Professional Education Prerequisite 9

SPED 313	Fundamentals of Human Growth and Development: Birth through Adolescence
SPED 400	Foundations of Special Education: Legal Aspects and Characteristics
TLED 430	PK-12 Instructional Technology

Graduate Professional Education 31-34*

TLED 608	Foundations of Education and Instructional Assessment
SPED 517	Collaboration and Transitions
TLED 568	Language Acquisition and Reading for Students with Diverse Learning Needs (Required for PreK-6 and 6-8)
READ 680	Reading to Learn Across the Curriculum
TLED 640	The Management of Learning and Instruction
FOUN 641	Assessment and Evaluation of Student Learning

Select one or two from the following instructional/methods courses related to your endorsement**

STEM 534	Developing Instructional Strategies PreK-6: Science
STEM 553	Developing Instructional Strategies for Teaching in the Middle/High School: Mathematics
STEM 554	Developing Instructional Strategies for Teaching in the Middle/High School: Science
TLED 535	Developing Instructional Strategies PreK-6: Social Studies
TLED 551	Developing Instructional Strategies for Teaching in the Middle/High School: English
TLED 555	Developing Instructional Strategies for Teaching in the Middle/High School: Social Studies
TLED 583	Seminar in Teacher Education (1 credit)
Must Pass prior to starting the Teacher Candidate Internship	
TLED 668	Internship/Student Teaching and Seminar

All course work, professional education and content courses, with appropriate grades and GPA and all assessments with a passing score must be completed prior to the start of the teacher candidate internship.

Total Hours 40-43

New * 31 credit hours if seeking secondary education, 6-12
Footnote* 34 credit hours if seeking elementary education, preK-6 or 6-8
** Select one instructional strategies course if seeking secondary education; select two instructional strategies courses if seeking elementary education, preK-6 or 6-8

Due to changing University requirements, national standards, and the Virginia Board of Education licensure regulations, the programs in the Darden College of Education are under constant revision. Any changes resulting from these factors supersede the program requirements described in this Catalog. Students are encouraged to obtain current program information from their advisors and from the Teacher Education Services website: <http://www.odu.edu/tes>.

Master of Science in Education, Secondary Education, Teachers of English to Speakers of Other Languages (TESOL), K-12, Initial Licensure

145 Education Building
757-683-3284

Robert Lucking, Graduate Program Director

The Masters of Science in Education-Secondary- Teaching English as a Second Language (TESOL) concentration is for individuals who hold an undergraduate degree and wish to earn a Master of Science in Education degree and qualify for a Virginia Teaching license for grades K-12 in English as a Second Language. The program emphasis is Teaching English to speakers of other languages.

Admission

1. All students must apply for and be admitted into the approved M.S. Ed with initial licensure program for Teaching English as a Second Language (TESOL – PK-12).
2. A bachelor's degree from a regionally accredited college/university is required in the liberal arts and sciences (or equivalent).
3. Students must meet the required criteria for admission by passing the Virginia Board of Education prescribed assessments and earning the minimum required Grade point averages (GPA).

Virginia Board of Education prescribed entry assessments are outlined in the Teacher Education Services and Advising section of this catalog.

- A passing PRAXIS I composite score of 532 by December 31, 2013 or
- Passing Praxis Cores section scores (Reading score of 156, Writing score of 162, and Math score of 150) beginning January 1, 2014 or
- Qualifying SAT or ACT test scores or
- PRAXIS I Math test score of 178 and a composite Virginia Communication and Literacy (VCLA) score of 470 by December 31, 2013 or
- Praxis Core math test score of 150 and a composite Virginia Communication and Literacy (VCLA) score of 470 beginning January 1, 2014 or
- SAT Mathematics test score of 530 and a composite Virginia Communication and Literacy (VCLA) score of 470 or
- ACT Mathematics test score of 22 and a composite Virginia Communication and Literacy (VCLA) score of 470

To review more information on the Virginia Board of Education prescribed assessments visit the Teacher Education Services website, <http://www.odu.edu/tes>.

4. A cumulative undergraduate GPA of 2.80 is required for admission.
5. Only courses that meet the grade required for the academic major or professional education will be accepted for admission in the Darden College of Education.
6. Satisfactory scores must be submitted on either the Graduate Record Examination or Miller Analogies Test.
7. An application for graduate studies and official transcripts must be submitted by the appropriate deadline for admission. Under certain circumstances, applicants who do not fully meet the requirements for regular admission to the program may be admitted on a provisional basis subject to conditions specified by the graduate program director for TESOL.

Continuance

1. Students must complete the Responsible Conduct of Research (RCR) modules during the first twelve graduate credit hours at Old Dominion University. For more information review the instructions at: <http://www.odu.edu/education/resources/conduct-of-research-instructions>
2. Students must maintain a cumulative GPA of 3.00 and a minimum of 3.00 GPA in the major. A minimum "B-" grade required for all graduate professional education courses.
3. A grade of "B" or higher is required in all practicum coursework.
4. Students must take and pass the Virginia Communication and Literacy Assessment (VCLA) and the PRAXIS II examination for TESOL prior to or while enrolled in the instructional strategies course.
5. All assessments must be passed prior to the start of the Teacher Candidate Internship Orientation session.
6. A criminal background check must be completed prior to placement in a field experience required for practicum courses and for the teacher candidate internship. For more information please review the policy in the Teacher Education Services website: <http://www.odu.edu/tes>.

Virginia Board of Education prescribed professional assessments:

- **Virginia Communication and Literacy Assessment (VCLA)** – a passing composite score of 470 is required on this reading and writing assessment
- **Student must meet the PRAXIS II TESOL requirement, test code #0361**
- To review more information on the Virginia Board of Education prescribed assessments visit the Teacher Education Services website, <http://www.odu.edu/tes>.

Exit

Requirements for graduation include the following:

1. passage of the written Comprehensive exam,
2. completion of the Graduate Assessment,
3. a minimum cumulative 3.00 GPA and a minimum B- grade required for all graduate professional education courses,
4. successful completion of the Teacher Candidate Internship,
5. an exit interview,
6. completion of all course requirements, and
7. submission of an application for graduation.

Only courses that meet the grade required for the academic major or professional education will be accepted toward licensure requirements in the Darden College of Education.

Program Requirements

Students seeking initial licensure plus a master's degree in TESOL (PK-12) must meet the grade required for the academic content requirement in English and professional education courses. Transcripts will be evaluated by the education advisor to determine whether the academic requirements have been met by previous course work.

Curriculum

Prerequisite Courses		12
SPED 313	Fundamentals of Human Growth and Development: Birth through Adolescence	
ENGL 440/540	General Linguistics (fall only)	
Select one from the following:		
Foreign Language		
English for foreign speakers		
Academic Content courses in English		12
ENGL 677	Language and Communication Across Cultures	
ENGL 679	First and Second Language Acquisition	
ENGL 670	Methods and Materials in TESOL (spring only)	
Select one from the following:		
ENGL 542	English Grammar	
ENGL 550	American English	
ENGL 672	Syntax	
ENGL 678	Sociolinguistics	
Graduate Professional Education		27
TLED 608	Foundations of Education and Instructional Assessment	
TLED 530	PK-12 Instructional Technology	
TLED 640	The Management of Learning and Instruction	
READ 683	Diagnostic Teaching of Reading in the Classroom	
READ 686	Advanced Language Development and Reading	
FOUN 641	Assessment and Evaluation of Student Learning	
TLED 636	Problems in Education	
TLED 669	Internship/Student Teaching and Seminar (student teaching)	
Total Hours		51

Due to changing University requirements, national standards, and the Virginia Board of Education licensure regulations, the programs in the Darden College of Education are under constant revision. Any changes resulting from these factors supersede the program requirements described in this Catalog. Students are encouraged to obtain current program information from their advisors and from the Teacher Education Services website: <http://www.odu.edu/tes>.

Secondary Education, Teachers of English to Speakers of Other Languages (TESOL), K-12, Post-Baccalaureate Endorsement

This Post-Baccalaureate endorsement program in Teaching English as a Second Language (K-12) is designed for individuals with a non-teaching B.S. or B. A. degree who want to obtain licensure as a teacher in TESOL.

Admission

1. All students must apply for and be admitted into the approved post-baccalaureate endorsement program for TESOL (K-12).
2. Students must meet the required criteria for admission by passing the Virginia Board of Education prescribed assessments and earning the minimum required Grade point averages (GPA).

Virginia Board of Education prescribed entry assessments are outlined in the Teacher Education Services and Advising section of this catalog.

Virginia Board of Education prescribed assessments:

- A passing PRAXIS I composite score of 532 by December 31, 2013 or
- Passing Praxis Core section scores (Reading score of 156, Writing score of 162, and Math score of 150) beginning January 1, 2014 or
- Qualifying SAT or ACT test scores or
- PRAXIS I Math test score of 178 and a composite Virginia Communication and Literacy (VCLA) score of 470 by December 31, 2013 or
- Praxis Core Math test score of 150 and a composite Virginia Communication and Literacy (VCLA) score of 470 beginning January 1, 2014 or
- SAT Mathematics test score of 530 and a composite Virginia Communication and Literacy (VCLA) score of 470 or
- ACT Mathematics test score of 22 and a composite Virginia Communication and Literacy (VCLA) score of 470

To review more information on the Virginia Board of Education prescribed assessments visit the Teacher Education Services website, <http://www.odu.edu/tes>.

3. A cumulative undergraduate GPA of 2.75 is required for admission.
4. Only courses that meet the grade required for the academic major or professional education will be accepted for admission in the Darden College of Education.
5. An application for non-degree admission must be submitted by the appropriate deadline for admission. Under certain circumstances, applicants who do not fully meet the requirements for regular admission to the program may be admitted on a provisional basis subject to conditions specified by the graduate program director for TESOL education.

Continuance

1. Students must complete the Responsible Conduct of Research (RCR) modules during the first twelve graduate credit hours at Old Dominion University. For more information review the instructions at: <http://www.odu.edu/education/resources/conduct-of-research-instructions>
2. Students must maintain a cumulative GPA of 2.75.
3. A grade of “**B**” or higher is required in all practicum coursework. A minimum grade of “**B-**” is required for all graduate professional education courses.
4. Students must take and pass all Virginia Board of Education prescribed assessments including the Virginia Communication and Literacy Assessment (VCLA), and must meet PRAXIS II TESOL requirement, test code #0361.
5. All assessments must be passed prior to the start of the Teacher Candidate Internship Orientation session.
6. A criminal background check must be completed prior to placement in a field experience required for practicum courses and for the teacher candidate internship. For more information please review the policy in the Teacher Education Services website: <http://www.odu.edu/tes>.

To review more information on the Virginia Board of Education prescribed professional assessments visit the Teacher Education Services website, <http://www.odu.edu/tes>.

Exit

Requirements for completion are as follows:

1. a minimum cumulative 2.75 GPA,
2. successful completion of the Teacher Candidate Internship,
3. completion of all course requirements and a minimum grade of B- is required for all graduate professional education courses
4. submission of an application for Virginia licensure.

Only courses that meet the grade required for the academic major or professional education will be accepted toward licensure requirements in the Darden College of Education.

Program Requirements

Students seeking initial licensure for TESOL K-12 grades must meet the grade required for the academic concentration and professional education courses. Transcripts will be evaluated by the education advisor to determine whether the academic requirements have been met by previous course work. Subject area specific course work that was not met in previous course work must be completed prior to Teacher Candidate Internship (student teaching) orientation session.

Curriculum

Prerequisite Courses

SPED 313	Fundamentals of Human Growth and Development: Birth through Adolescence	3
ENGL 440/540	General Linguistics	3

Select one from the following:

Foreign Language

English for foreign speakers

Academic Content courses in English

ENGL 677	Language and Communication Across Cultures	3
ENGL 679	First and Second Language Acquisition	3
ENGL 670	Methods and Materials in TESOL	3

Select one from the following:

ENGL 542	English Grammar	3
ENGL 550	American English	3
ENGL 672	Syntax	3
ENGL 678	Sociolinguistics	3

Professional Education

TLED 301	Foundations and Introduction to Assessment of Education	3
TLED 430	PK-12 Instructional Technology	3
TLED 360	Classroom Management and Discipline	2
TLED 408	Reading and Writing in Content Areas	3
READ 683	Diagnostic Teaching of Reading in the Classroom	3
READ 686	Advanced Language Development and Reading	3
TLED 485	Teacher Candidate Internship	12
Total Hours		56

Due to changing University requirements, national standards, and the Virginia Board of Education licensure regulations, the programs in the Darden College of Education are under constant revision. Any changes resulting from these factors supersede the program requirements described in this Catalog. Students are encouraged to obtain current program information from their advisors and from the Teacher Education Services website: <http://www.odu.edu/tes>.

Library Science (School Librarianship K-12)

Master of Science in Education, Elementary Education, Library Science, K-12

Master of Science in Education, Secondary Education, Library Science, K-12

145 Educational Building
757-683-3284

Jody Howard, Graduate Program Director

General Description of the School Library Program

Contained within this program are the library science post-baccalaureate endorsement for licensed teachers (non-degree), a Master of Science in Education leading to endorsement in Library Science K-12 for licensed

teachers, and a Master of Science in Education with initial licensure in library science K-12 for non-teachers.

Library Science Post-Baccalaureate Endorsement K-12 for Licensed Teachers (Non-Degree)

This non-degree graduate endorsement program leads to licensure as a school librarian (K-12) for individuals who already have a current Virginia teaching license. Students applying to this program must complete a post-baccalaureate application form.

Admission

Students must:

1. hold a bachelor's degree from an accredited institution;
2. have at least a collegiate professional teaching certificate from the Commonwealth of Virginia,
3. have a cumulative GPA of 2.75 for all college credit courses taken in the baccalaureate degree program,
4. have an interview and recommendation by a departmental representative in library science or his/her designee, and
5. submit an application for licensure only studies.

No courses in the academic major or professional education in which the student has made below a "C-" will be accepted for licensure in the Darden College of Education.

Under certain circumstances, applicants who do not fully meet the requirements for regular admission to the program may be admitted on a provisional basis subject to conditions specified by the program director for library science.

Continuance

Students must:

1. maintain a grade point average of 3.00.
2. have a criminal background check completed prior to placement in a field experience required for practicum courses. For more information please review the policy in the Teacher Education Services website: <http://www.odu.edu/tes>.
3. complete the Responsible Conduct of Research (RCR) modules during the first twelve graduate credit hours at Old Dominion University. For more information review the instructions at: <http://www.odu.edu/education/resources/conduct-of-research-instructions>

Exit

Students must:

1. have a 3.00 grade point average;
2. have an exit interview;
3. have completed all course requirements; and
4. have successfully completed a portfolio review.

Curriculum

Required courses

LIBS 602	Production of Instructional Materials	3
LIBS 605	Selection and Utilization of Non-Book Media	3
LIBS 675	Administration, Management, and Evaluation of Libraries (Required first course)	3
LIBS 676	Library Media Services and the Curriculum	3
LIBS 677	Technical Services in Libraries	3
LIBS 678	Selection, Evaluation and Utilization of Materials NK-12 *	4
LIBS 679	Theory and Management of Reference and Information Retrieval	3

LIBS 669	Practicum in School Libraries	3-9
Total Hours		25-31

* Prerequisite: LIBS 642 or equivalent

** Taken after the completion of all library courses.

Master of Science in Education, Secondary or Elementary Education, Library Science Endorsement for Licensed Teachers

145 Educational Building
757-683-3284

Jody Howard, Graduate Program Director

This program leads to a master's degree plus licensure as a school librarian (K-12) for individuals who already have licensure as a teacher. Students applying to this program may apply for a degree in either elementary or secondary education and should designate the library science concentration on the application form.

Admission

Students must:

1. hold a bachelor's degree from a regionally accredited college/university;
2. hold the Virginia Collegiate Professional License or an equivalent license from another state;
3. have a general undergraduate grade point average of at least 2.80;
4. take and receive satisfactory scores on either the Graduate Record Examination or Miller Analogies Test;
5. have an interview with the graduate program director; and
6. apply for admission to graduate school.

Performance in classes taken as a non-degree student will not be taken into consideration in the admission process. Under certain circumstances, applicants who do not fully meet the requirements for regular admission to the program may be admitted on a provisional basis subject to conditions specified by the graduate program director for elementary/middle education or the graduate program director for secondary education.

Continuance

Students must:

1. maintain a grade point average of 3.00;
2. maintain a grade point average of 3.00 in the major;
3. complete the Responsible Conduct of Research (RCR) modules during the first twelve graduate credit hours at Old Dominion University. For more information review the instructions at: <http://www.odu.edu/education/resources/conduct-of-research-instructions> ; and
4. have a criminal background check completed prior to placement in a field experience required or practicum courses and for the teacher candidate internship. For more information please review the policy in the Teacher Education Services website: <http://www.odu.edu/tes>.

Exit

Students must:

1. have a 3.00 grade point average;
2. have a 3.00 grade point average in the major;
3. have an exit interview;
4. have completed all course requirements; and
5. submit an application for graduation; and
6. have successfully completed a portfolio review.

Program Requirements

Core		25
LIBS 602	Production of Instructional Materials	
LIBS 605	Selection and Utilization of Non-Book Media	

LIBS 675	Administration, Management, and Evaluation of Libraries (Required first course)	
LIBS 676	Library Media Services and the Curriculum	
LIBS 677	Technical Services in Libraries	
LIBS 678	Selection, Evaluation and Utilization of Materials NK-12 *	
LIBS 679	Theory and Management of Reference and Information Retrieval	
LIBS 669	Practicum in School Libraries *****	
Support Elective credits **		3-9
Research Core		6-12
Thesis option ***		
FOUN 612	Applied Research Methods in Education	
TLED 698	Thesis	
FOUN 722	Introduction to Applied Statistics and Data Analysis	
Problems paper option ****		
FOUN 612	Applied Research Methods in Education	
TLED 636	Problems in Education	
Total Hours		34-46

* Prerequisite: LIBS 642 or equivalent

** Prerequisite for the core may be counted as support courses if taken on the graduate level within six years of the date of graduation. These courses must be selected in consultation with the graduate program director or advisor.

*** 9-12 credits; 37 credits required for graduation.

**** 6 credits; 34 credits required for graduation.

***** Taken after the completion of all library courses.

Master of Science in Education, Elementary or Secondary Education, Library Science, K-12, Initial Licensure for Non-Teachers

145 Education Building
757-683-3284

Jody Howard, Graduate Program Director

This is an initial licensure program as a school library media specialist for people with a non-teaching B.S. or B.A. It is offered as part of the Master of Science in Education - elementary/middle education. In this program, students who do not have teacher licensure but who are seeking licensure as a school librarian (K-12) and a master's degree in education will complete professional studies courses in addition to a prescribed set of school library courses and a research core. The minimum number of graduate credits for the program is 63.

Admission

Students must:

1. hold a bachelor's degree from a regionally accredited college/university;
2. achieve passing scores (as established by the Commonwealth of Virginia) on the Praxis I Academic Skills Assessment or Board-approved SAT/ACT scores;
3. have a cumulative grade point average of 2.80;
4. take and receive satisfactory scores on either the Graduate Record Examination or Miller Analogies Test;
5. have an interview with the graduate program director; and
6. submit an application for graduate studies.

Performance in classes taken as a non-degree student will not be taken into consideration in the admission process. No courses in the academic major or professional education in which the student has made below a "C-" will be accepted for licensure in the Darden College of Education.

Under certain circumstances, applicants who do not fully meet the requirements for regular admission to the program may be admitted on a provisional basis subject to conditions specified by the graduate program director for **school librarianship**.

Continuance

Students must:

1. maintain a grade point average of 3.00;
2. maintain a grade point average of 3.00 in the major;
3. receive a B or better in practicum to participate in teacher internship;
4. have a criminal background check completed prior to placement in a field experience required for practicum courses and for the teacher candidate internship. For more information please review the policy in the Teacher Education Services website: <http://www.odu.edu/tes>.
5. complete the Responsible Conduct of Research (RCR) modules during the first twelve graduate credit hours at Old Dominion University. For more information review the instructions at: <http://www.odu.edu/education/resources/conduct-of-research-instructions>

Exit

Students must:

1. have a 3.00 grade point average;
2. have an exit interview;
3. have completed all course requirements;
4. submit an application for graduation; and
5. pass the Virginia Communication and Literacy Assessment (VCLA) prior to licensure; and
6. have successfully completed a portfolio review.

No courses in the academic major or professional education in which the student has made below a "C-" will be accepted for licensure requirements in the Darden College of Education.

Program of Study

Prerequisites. Individuals entering this graduate program must already possess a bachelor's degree and must pass the professional teacher's assessment requirement (currently Praxis I or equivalent SAT or ACT score) prescribed by the Virginia Board of Education. No courses in the academic major or professional education in which the student has made below a C- will be accepted toward licensure requirements in the College of Education.

Professional Education *		27
TLED 301	Foundations and Introduction to Assessment of Education	
TLED 430/530	PK-12 Instructional Technology	
TLED 479/579	Classroom Management and Practice PreK-3; PreK-6	
TLED 586	Student Teaching for Special Endorsement **	
READ 680	Reading to Learn Across the Curriculum	
SPED 313	Fundamentals of Human Growth and Development: Birth through Adolescence	
Select one of the following instructional strategies courses:		
STEM 433/533	Developing Instructional Strategies PreK-6: Mathematics	
STEM 434/534	Developing Instructional Strategies PreK-6: Science	
TLED 435/535	Developing Instructional Strategies PreK-6: Social Studies	

Library Science ***		25
LIBS 602	Production of Instructional Materials	
LIBS 605	Selection and Utilization of Non-Book Media	
LIBS 642	Children's Literature Across the Curriculum, PK-8	

LIBS 675	Administration, Management, and Evaluation of Libraries (required first course)	
LIBS 676	Library Media Services and the Curriculum	
LIBS 677	Technical Services in Libraries	
LIBS 678	Selection, Evaluation and Utilization of Materials NK-12 ****	
LIBS 679	Theory and Management of Reference and Information Retrieval	
Research Problems paper		6
FOUN 612	Applied Research Methods in Education	
TLED 636	Problems in Education	
Total Hours		58

* Some of these are undergraduate credits and/or may have been taken as an undergraduate.

** To be taken after the completion of all required professional education and library science courses.

*** Taken after at least 12 credits of professional education have been completed.

**** Prerequisite: LIBS 642 or equivalent

Master of Science in Education, Reading Specialist, K-12, Licensed Teachers

145 Education Building
757-683-3284

Tom Bean, Graduate Program Director

General Description of Reading Education

Reading Education offers two programs, 1) the Master of Science in Education, Reading Specialist, K-12, for licensed teachers, and 2) the Reading Specialist, K-12, Post-baccalaureate Endorsement for licensed teachers (non-degree, post-baccalaureate) for candidates already having a master's degree in education. A Doctor of Philosophy in Education with an emphasis in Literacy Leadership within the Curriculum and Instruction program is offered for those seeking additional study in the field of literacy.

Master of Science in Education—Reading plus Reading Specialist Endorsement

The program is designed to provide professional training for prospective reading specialists, literacy coaches, and elementary- and secondary-level reading teachers.

Extensive course offerings permit the graduate student to pursue an area of interest, such as elementary school reading, secondary school reading, college reading, literacy coaching, and reading in clinical settings. As a culminating experience, each student investigates a problem area and prepares a formal research paper or project on a topic of interest.

Candidate study may include an intensive search of the professional literature on reading or selected field experiences in public, private, or governmental reading programs that provide reading services to clients. In addition, candidates tutor children and aid in the diagnosis and remediation of reading problems. Candidates who have three years of satisfactory experience in teaching reading, completed the entire degree program, and satisfactorily completed the Reading for Virginia Educators: Reading Specialists-coded 0304 or 5304 may obtain the reading specialist endorsement.

Admission

Students must:

1. hold a bachelor's degree from a regionally accredited college/university;
2. hold and submit a copy of the Virginia Collegiate Professional License or an equivalent license from another state;
3. have an undergraduate grade point average of 2.80 and an average of 3.00 in the major;

4. achieve a satisfactory score (as established by the T&L Department) on the Graduate Record Examination or the Miller Analogies Test;
5. have an interview with the graduate program director;
6. have had three semester credits in reading courses at the undergraduate level; and
7. submit an application for graduate studies.

Performance in classes taken as a non-degree student will not be taken into consideration in the admission process. Under certain circumstances, applicants who do not fully meet the requirements for regular admission to the program may be admitted on a provisional basis subject to conditions specified by the graduate program director for reading education.

Continuance

Students must

1. complete the Responsible Conduct of Research (RCR) modules during the first twelve graduate credit hours at Old Dominion University. For more information review the instructions at: <http://www.odu.edu/education/resources/conduct-of-research-instructions>
2. maintain a grade point average of 3.00, and
3. maintain a grade point average of 3.00 in the major.

Exit

Students must

1. have a 3.00 grade point average;
2. have a 3.00 grade point average in the major;
3. complete an exit survey;
4. have completed all course requirements;
5. submit an application for graduation; and
6. pass the Reading for Virginia Educators: Reading Specialists Examination coded 0304 or 5304.

Program Requirements

A minimum of 33 semester credits is required for the master's degree in reading education. The degree candidate must successfully pass the Virginia reading specialist licensure examination, usually taken in the last semester of the program.

Course requirements for completion of the degree program are listed below.

Area I: Required Core		27
READ 612	Action Research in Reading	
READ 618	Approaches to Teaching Literature and Writing K-12	
READ 619	Word Study, Phonics, and Linguistics	
READ 622	Culturally Responsive Literacy for All Learners	
READ 680	Reading to Learn Across the Curriculum	
READ 683	Diagnostic Teaching of Reading in the Classroom	
READ 685	Organizing and Supervising Reading Program Development	
READ 686	Advanced Language Development and Reading	
READ 693	Practicum in Reading	
Area II: Electives (select 2)		6
READ 620	Multicultural Children's Literature and Literacy	
READ 625	Issues and Trends in Literacy Education	
READ 628	New Literacies, Digital Technologies, and Learning	
Total Hours		33

Reading Specialist, K-12, Post-baccalaureate Endorsement for Licensed Teachers

The non-degree post-baccalaureate endorsement program leads to licensure as a reading specialist for individuals already having a current Virginia teaching license and a master's degree in education.

Admission

Students must:

1. obtain and submit a completed licensure-only application form to the Graduate Program Director for Reading,
2. submit official transcripts to the Graduate Program Director for Reading, and
3. submit evidence of a current teaching license (Collegiate Professional License) to the Graduate Program Director for Reading.

Continuance

Students must:

1. make an appointment and meet with the Graduate Program Director for Reading before or upon completion of no more than six graduate credits,
2. maintain a GPA of 3.0 or better,
3. complete the Responsible Conduct of Research (RCR) modules during the first twelve graduate credit hours at Old Dominion University.

For more information review the instructions at: <http://www.odu.edu/education/resources/conduct-of-research-instructions>

Exit

Students must

1. satisfactorily complete all required coursework,
2. pass the Reading for Virginia Educators: Reading Specialists Examination- coded 0304 or 5304,
3. document three years successful teaching experience with reading being a major portion of the teaching responsibilities, and
4. apply for the Reading Specialist Endorsement through Teacher Education Services. For information contact Teacher Education Services at <http://education.odu.edu/tes/>.
Curriculum

Required for Endorsement

READ 618	Approaches to Teaching Literature and Writing K-12	3
READ 619	Word Study, Phonics, and Linguistics	3
READ 622	Culturally Responsive Literacy for All Learners	3
READ 680	Reading to Learn Across the Curriculum	3
READ 683	Diagnostic Teaching of Reading in the Classroom	3
READ 685	Organizing and Supervising Reading Program Development	3
READ 686	Advanced Language Development and Reading	3
READ 693	Practicum in Reading	3
Total Hours		24

Doctor of Philosophy in Education – Literacy Leadership Emphasis within the Curriculum and Instruction Program

145 Education Building
757-683-3283, 757 683-3284

Charlene Fleener, Advisor

The Doctor of Philosophy in Curriculum and Instruction at the Darden College of Education of Old Dominion University, with concentrations in Curriculum and Instruction, Early Childhood Education, and Literacy Leadership provides the opportunity for students to become scholarly leaders to serve our nation's schools, colleges, universities and related agencies such as business, government, and research institutions to contribute to global education. The curricula is solidly grounded in interpreting and producing research, use of technology to enhance the teaching/learning process, equity, and leadership, which are woven into common core courses and concentration-specific courses.

Literacy Leadership Emphasis:

The Doctor of Philosophy in Education with an emphasis in Literacy Leadership is a degree with a unique focus to prepare individuals as literacy professionals for leadership and supervisory roles, teaching literacy curriculum and instruction in higher education, and/or consulting for educational organizations or private industry. The program provides study of theories, methodologies, and research with opportunities to develop individual expertise in research, writing, and pedagogy. Personalized mentorship is provided for those who desire careers in academic research, program/curriculum design and evaluation, and higher education, including teacher preparation, policy, and leadership.

See the PhD in Curriculum and Instruction for complete program information.

Doctor of Philosophy in Education – Curriculum and Instruction

145 Education Building
757-683-3284

Richard C. Overbaugh, Graduate Program Director

The Doctor of Philosophy in Curriculum and Instruction at the Darden College of Education of Old Dominion University, with concentrations in Curriculum and Instruction, Early Childhood Education, and Literacy Leadership provides the opportunity for students to become scholarly leaders to serve our nation's schools, colleges, universities, and related agencies such as business, government, and research institutions to contribute to global education. The curricula is solidly grounded in interpreting and producing research, use of technology to enhance the teaching/learning process, equity, and leadership, which are woven into common core courses and concentration-specific courses.

Concentration Areas:

Curriculum and Instruction:

The Doctor of Philosophy in Education with a concentration in Curriculum and Instruction is the degree most often desired by classroom teachers and school librarians. The program of study includes core courses shared by all three concentrations plus the freedom to choose courses that meet individual specialty area interests (e.g., library science, mathematics, social studies, instructional design etc.) Students are prepared to be scholarly leaders for academic positions in higher education or in K12 schools. Personalized mentorship is provided for those who desire careers in academic research, program/curriculum design and evaluation, and higher education, including teacher preparation, policy, and leadership.

Literacy Leadership:

The Doctor of Philosophy in Education with a concentration in Literacy Leadership is a degree with a unique focus to prepare individuals as literacy professionals for leadership and supervisory roles, teaching literacy curriculum and instruction in higher education, and/or consulting for educational organizations or private industry. The program provides study of theories, methodologies, and research with opportunities to develop individual expertise in research, writing, and pedagogy. Personalized mentorship is provided for those who desire careers in academic research, program/curriculum design and evaluation, and higher education, including teacher preparation, policy, and leadership.

Early Childhood Education:

The Doctor of Philosophy in Education with a concentration in Early Childhood Education program, through its integral partnership with the Old Dominion University Child Study and Development Centers, focuses on the multidisciplinary study of the cognitive, language, and healthy social/emotional development of young children from birth to age nine. The program prepares students to become faculty in colleges and universities and senior administrators in institutions and agencies. Personalized mentorship and professional training is provided for those who desire careers in academic research, child advocacy, program design and evaluation, and higher education, including teacher preparation, policy, and administrative leadership.

Admission

Admission to the Ph.D. programs in the Department of Teaching & Learning is competitive. Applicants should have a completed master's degree in an appropriate discipline from a regionally accredited university. Degrees that are equivalent to a master's degree such as L.L.B., J.D., and D.D.S., will be considered. A number of criteria are considered including graduate and undergraduate GPAs, GRE scores, writing ability, a personal interview, and the match between student interests and faculty expertise. Meeting the minimum requirements established by the department does not ensure admission to the program. A minimum undergraduate GPA of 2.8 and a minimum graduate GPA of 3.25 are recommended.

Application requirements for the Ph.D. in Curriculum and Instruction are as follows:

1. A completed master's degree in an appropriate discipline from a regionally accredited university;
2. Three letters of reference from sources including employment supervisors and/or university faculty members capable of commenting on the applicant's current readiness for advanced graduate study;
3. A 1500 word statement of the applicant's academic and professional goals with an emphasis on how the Ph.D. degree in curriculum and instruction will contribute to the achievement of the stated goals;
4. Submission of a professional curriculum vitae. Three years of teaching experience are preferred;
5. A completed online application from the Office of Graduate Admissions;
6. Official transcripts of all undergraduate and graduate courses and degrees completed;
7. Official report scores from the Graduate Record Examination (verbal, quantitative, and analytical) taken within the last five years.
8. Applicants whose native language is not English must submit a current score for the Test of English as a Foreign Language (TOEFL) of at least 600 (written) or 250 (computer based).

Applications must be complete and submitted to the ODU Office of Graduate Admissions by Oct 15 for spring admissions, and March 1 for Summer and Fall admissions (dates subject to change). Note: If you wish to apply for Financial Aid, deadlines for application are as much as six months earlier. Contact the Financial Aid office at 757-683-3683. Financial aid is awarded only to regularly admitted graduate students.

Completed applications will be reviewed by the Ph.D. Curriculum and Instruction Admissions and Continuance Committee. Selected applicants will be invited to campus to participate in various activities including an on-campus interview, writing sample, and a class visit.

Prerequisite Coursework

Prospective students should also have prior course work in statistics, and curriculum and instruction. If this requirement is not met, then additional course work will be added to the student's graduate program of study.

All students admitted into the Ph.D. program must complete the following prerequisite courses unless they have previously completed equivalent graduate level coursework or expertise.

- Introduction to Research in Education (FOUN 611) or Applied Research Methods in Education (FOUN 612) or equivalent)
- Statistics Applied to Research in Education (FOUN 722 or equivalent)

Degree Requirements

The Ph.D. program in Curriculum and Instruction is comprised of courses totaling a minimum of 60 academic credit hours beyond the master's degree. The curriculum includes a 15 hour research/foundations block, a 15 hour "common core" taken by all PhD students regardless of concentration, a 15 hour concentration core and a 15 hour dissertation block, which includes the dissertation seminar. The dissertation will often require more than 12 credit hours depending on the length of time necessary for completion. Students entering the program may also need to complete introductory research methods statistics courses (FOUN 611, FOUN 612 or equivalent) & Statistics Applied to Research in Education (FOUN 722 or equivalent) if they have not had such courses or cannot demonstrate competency at a satisfactory level. Students who come into the Ph.D. program with a master's degree in an academic field that is unrelated to curriculum and instruction and/or who have not completed courses to develop competency in specified areas may need to complete these courses in addition to the required courses. Students must complete the Responsible Conduct of Research (RCR) modules during the first twelve graduate credit hours at Old Dominion University. For more information review the instructions at: http://education.odu.edu/docs/Responsible_Conduct_of_Research_Programs.pdf.

Program Continuance, Completion and Exit

It is the expectation that Curriculum and Instruction faculty will prepare Ph.D. candidates to become competent professionals with the knowledge, skills, and dispositions necessary to assume positions as researchers, teacher leaders, advocates, and scholars. On an annual basis, the Curriculum & Instruction Ph.D. Admissions and Continuance Committee and each student's advisor will formally convene to discuss the continuance of each student in the doctoral degree program.

In order to complete the program, students must fully comply with the curriculum below, and all requirements noted elsewhere in the University catalog for graduate students and within the Ph.D. in Education Handbook. It is the responsibility of the student to obtain these materials and adhere to program requirements.

Course List

Prerequisite Coursework *

Students must have taken ONE of the following research courses or equivalent:

ELS 660	Program Evaluation, Research and Planning	3
FOUN 611	Introduction to Research Methods in Education	3
FOUN 612	Applied Research Methods in Education	3

Students must also have the following or equivalent:

FOUN 722	Introduction to Applied Statistics and Data Analysis	3
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Early Childhood Education students must also have the following two courses or equivalents as determined by the Program Director

FOUN 641	Assessment and Evaluation of Student Learning	3
TLED 677	Advanced Child Development Theory and Research	3

Research Core (required) **

FOUN 812	Research Design and Analysis	3
FOUN 814	Qualitative Research Design in Education	3

Choose one course from EACH of the following bound pairs

FOUN 822	Applied Linear Models in Educational Research	3
or FOUN 823	Analysis of Variance Applied to Educational Research	
FOUN 840	Educational Measurement and Assessment	3

or FOUN 870	Formative Assessment of Student Learning for School Leaders and Curriculum Specialist	
FOUN 815	Advanced Qualitative Research	3
or FOUN 813	Program Evaluation in Education	

Note: A research cognate can be earned by taking an additional four courses beyond the required 15 hours.

Common Core (Required by all C&I Concentrations) **

TLCI 802	Historical and Contemporary Perspectives on Education	3
TLCI 803	Perspectives and Inquiry in Curriculum and Instruction	3
FOUN 830	Theories of Learning and Instruction	3
TLCI 804	Instruction Theories and Models	3
TLCI 805	Critical Issues: Curriculum Research	3

Literacy Leadership Concentration (required) **

TLCI 826	Advanced Supervision of Reading Programs	3
TLCI 827	Advanced Practicum in Reading	3
TLCI 828	Contemporary Issues in Literacy Research	3
ELS 787	Pupil Personnel Services for Diverse Populations	3
ELS 878	Leadership for Teaching and Learning	3

The literacy leadership concentration requires a minimum of 18 graduate credit hours in Literacy or closely related coursework

Early Childhood Education ** and ****

TLCI or SPED 800	Social/Emotional Aspects of Child Development	
TLCI 835	Connecting Research In Early Developmental Practice in Early Childhood Education	3
TLCI 895	Topics in Education ((Internship))	1-3
TLCI 836	Working with At-Risk Children and Families: An Ecological Approach	3
TLCI 840	Issue in Early Language and Literacy	3

Curriculum and Instruction Concentration 15

C&I emphasis students, working with an advisor, will complete a 15-hour concentration block according to individual areas of specialty.

C&I Approved Course 1	
C&I Approved Course 2	
C&I Approved Course 3	
C&I Approved Course 4	
C&I Approved Course 5	

Dissertation

FOUN 881	Dissertation Seminar ***	3
TLCI 899	Dissertation	1-12
Total Hours		92-105

* All students admitted into the Ph.D. program in curriculum and instruction must complete these prerequisite courses unless they have previously completed equivalent graduate level coursework or have appropriate educational experience.

** Course substitutions must be approved by advisor

*** If the doctoral seminar is waived by doctoral committee, the hours are added to the content area.

**** Prerequisite coursework for the ECE Concentration is 12 credits. In addition to FOUN 611 and FOUN 612, the following are required for all students who did not have them as part of a Master's degree program: FOUN 641 and TLED 677.

Due to changing University requirements, national accreditation standards, and Commonwealth licensure regulations, the programs in the Darden College of Education are under constant revision. Any changes resulting from these factors supersede the program requirements described in the

catalog. Students are encouraged to obtain current program information from their advisors and the Darden College of Education website: <http://education.odu.edu/>.

Teacher Education Services

<http://www.odu.edu/tes>
152 Education Building
757-683-6448

Leigh Butler, Assistant Dean

The staff in the Office of Teacher Education Services and Advising (TES) in the Darden College of Education supports teacher education programs in the College of Arts and Letters, the College of Science, and the Darden College of Education. In this role of support, the mission of the Office of TES is to provide, facilitate, promote, and uphold the standards of Old Dominion University to grant undergraduate and graduate degrees with a teacher education emphasis in the following areas:

- PreK-3
- PreK-6
- 6-8
- 6-12
- K-12
- guidance and counseling, and
- speech-language.

The emphasis areas are accredited by the Council for the Accreditation of Education Preparation (CAEP), the Council on Accreditation of Counseling and Related Program (CACREP), American Speech Language and Hearing Association (ASHA), and approved by the Virginia Department of Education (VDOE).

The TES staff is committed to serving candidates pursuing a professional education emphasis through their respective college's academic departments and fostering a process with the following features:

- academic advisement of prospective teacher candidates pursuing an undergraduate or graduate degree with a professional education, including development of appropriate academic plans;
- promotion of professional education, including informing candidates of scholarship and study abroad opportunities, as well as credentialing requirements;
- communication with prospective teacher candidates regarding admissions, continuance, and exit requirements for their respective education degree and initial licensure programs; and
- facilitation of the placement of field experiences for teacher candidates in appropriate K-12 classroom settings in order to meet observation, practicum, and student teaching internship requirements.

Prescribed Virginia Board of Education Assessment for Admission to an Approved Teacher Education Program

Old Dominion University students seeking admission to an approved teacher education program must satisfy the Virginia Board of Education Required Assessment for Admission to an Approved Teacher Education Program. This requirement can be satisfied by meeting a passing score in one of the selected criteria below:

1. Passing Praxis I composite score of 532 by December 31, 2013; **or**
2. Passing Praxis Core Academic Skills Tests beginning January 1, 2014: Reading Score of 156, Writing Score of 162, and Mathematics Score of 150; **or**
3. Approved substitute test scores:
 - a. SAT score of 1000 with at least 450 verbal and 510 mathematics taken prior to April 1, 1995; **or**
 - b. SAT score of 1100 with at least 530 verbal and 530 mathematics taken after April 1, 1995; **or**

- c. ACT composite score of 21 with ACT mathematics score of at least 21, and ACT English plus Reading score of at least 37, taken prior to April 1, 1995.; **or**
- d. ACT composite score of 24 with ACT mathematics score of at least 22, and ACT English plus Reading score of at least 46, taken after April 1, 1995; **or**
- e. Praxis I Math test score of 178 by December 31, 2013 and a composite Virginia Communication and Literacy Assessment (hereafter referred to as the VCLA) score of 470; **or**
- f. Praxis Core Academic Skills Mathematics test score of 150 beginning January 1, 2014 and a VCLA score of 470; **or**
- g. SAT Mathematics test score of at least 510 taken prior to April 1, 1995 and a VCLA score of 470; **or**
- h. SAT Mathematics test score of at least 530 taken after April 1, 1995 and a composite VCLA score of 470; **or**
- i. ACT Mathematics test score of at least 21 taken prior to April 1, 1995 and a composite VCLA score of 470; **or**
- j. ACT Mathematics test score of at least 22 taken after April 1, 1995 and a composite VCLA score of 470.

Note: ACT scores taken prior to 1989 are not valid.

For the most current information on the prescribed Virginia Board of Education admission assessment, visit the Teacher Education Services website, <http://www.odu.edu/tes> and review the *Teacher Education Handbook*.

Early Field Experiences

1. A candidate may be eligible to participate in the practicum field experience required by the course if they have been admitted into an approved teacher education program. In addition, candidates must continue to meet the GPA for their individual programs, professional education courses, and minimum grade requirements, along with other course prerequisites.
2. A negative tuberculin screening test is required prior to the start of any field experiences, to include observation and practicum. Candidates must have a copy of the negative tuberculin screening test on hand at all times.
3. A provisionally licensed teacher may participate in an early practicum course if they are currently employed with a school division, have a letter from the Virginia Department of Education listing the course as a needed requirement, and have passing Virginia Communication and Literacy Assessment scores (VCLA). The provisionally licensed teacher will have to meet all the requirements of the course as stated in the syllabus.

We are committed to developing candidates skilled in teaching students of all cultural and socioeconomic backgrounds. Thus, candidates must complete their early practica in a public or private school that has been accredited by the Virginia Department of Education. Thus, teacher candidates may request specific school districts and schools. However, these requests are informal and ARE NOT guaranteed. Candidates may not contact school district personnel in order to request or obtain a placement. Candidates may not complete their practicum at a school where a relative is attending or working. Candidates are required to disclose this information on the on-line application.

Teacher Candidate Internship

The teacher internship is the culminating experience in the teacher education programs. This experience is a crucial part of a candidate's preparation to becoming a professional educator. During the teaching internship experience, candidates observe the operation of schools; analyze the implementation of curricula and instructional strategies; observe the growth and development of students; assist with classroom and extracurricular activities; and ultimately assume responsibility for the academic instruction and management of the classroom. Candidates' work is evaluated by clinical faculty (cooperating teachers in the schools, in conjunction with University supervisors).

To be eligible to participate in the teaching internship experience, the candidate must have been admitted into an approved teacher education program. Applications for the Fall student teaching semester are due February 1. Applications for the Spring student teaching semester are due August 1. Individuals who submit late applications will not receive placement. This requires that the candidate pass the the Prescribed Virginia Board of Education Assessment for Admission into an Approved Teacher Education Program (see scores above). In addition, candidates must meet the GPA requirements for their individual programs, professional education GPA requirements, and minimum grade requirements. Also, candidates must pass the Praxis II exam in their content area if one is required by the Virginia Department of Education for licensure, and the Virginia Communication and Literacy Assessment (VCLA), prior to the teacher candidate internship orientation. Candidates in the PreK-3, PreK-6, and Special Education programs must pass the Reading for Virginia Educators (RVE) Assessment prior to the teacher candidate internship. (Candidates who previously passed the VRA do not need to take the RVE). All assessments must be on file in the Teacher Education Services and Advising Office, room 152 Education Building, prior to the teacher candidate internship orientation -- no exceptions.

The TES staff are committed to supporting the development of candidates skilled in teaching students of all cultural and socioeconomic backgrounds. Thus, teacher candidates may complete their teaching internships in public or private schools that have been accredited by the Virginia Department of Education or other State Department of Education. Candidates may **request** specific school districts and schools. These requests are **informal and are not guaranteed**. Candidates may not contact school district personnel in order to request or obtain a placement. Candidates may not complete their internship at a school where a relative is attending or working. Candidates are required to disclose this information on the student teaching application. If a candidate is placed at a school where a relative is located, the candidate will be removed from the placement and will have to complete the internship the following semester. All assessments for student teaching must be in the Teacher Education Services Office (152 Education Building) by August 1 before Fall orientation and January 3 before Spring orientation for student teaching. All coursework must be completed with the required program grades, prior to the beginning of the teacher candidate internship orientation. Candidates may not student teach in the schools where they attended/ graduated from high school.

A negative tuberculin screening test is required prior to the teacher candidate internship. Prospective candidates are required to provide authorization for the release of any disciplinary action that is contained in their student records. Prior to placement, candidates may be required to complete the Virginia State Police Criminal History Check (SP230), the Child Protective Service Central Registry Release of Information (032-02-1515/1), and a fingerprint check by the school district. Candidates may be liable for all costs incurred. All candidates are required to review the Teacher Education Services website information for districts requiring background-checks (<http://www.odu.edu/success/academic/teacher-education/placement/background-checks>). Additionally, prospective teacher interns should avail themselves of liability or tort insurance, which can be obtained through membership in the Student Virginia Education Association of Old Dominion University.

Virginia Troops to Teachers

113 Education Building
757-683-3327, 1-800-560-4317
<http://www.odu.edu/troopstoteachers>

Joseph Wargo, Director

Troops to Teachers (TTT) was established in 1994 as a Department of Defense program and is managed by the Defense Activity for Non-Traditional Education Support (DANTES) in Pensacola, FL. Old Dominion University is the headquarters for Virginia TTT with all Commonwealth of Virginia institutions of higher learning participating in the program. The primary objective of TTT is to help recruit quality teachers for schools that serve low-income families throughout the United States. TTT helps relieve the teacher shortages, especially in math, science, special education and

other high-need subject areas, and assists military personnel in making a successful transition to a second career in teaching.

TTT provides a \$5,000 stipend to assist military personnel who are retired, within one year of retiring with an approved retirement date, or honorably discharged with six or more years of service and willing to obligate in the active reserves on a three-year contract. The stipend may be used to pay for any approved teacher licensure program in any state above the required bachelor's degree at any accredited college. The stipend may not be used for training principals, guidance counselors or ROTC instructors. TTT participants are obligated to teach for three years in a high-need school district.

Participants hired to teach in a setting where 50% or more of the students receive free or reduced lunches or their Individual Disability Education Act (IDEA) percentage is 13.5% or more are eligible for a \$10,000 bonus. Acceptance of any monies obligates the Troops to Teachers participant to teach for three years in a poverty-level school.

Virginia Department of Education Career Switcher Program

122 Education Building
757-683-4686, 1-800-262-0009
www.odu.edu/careerswitcher

Fran Puchalski, Co-Director

Lisa Temple, Co-Director

The Old Dominion University Programs for Continued Learning has offered the Career Switcher Program on behalf of the Virginia State Department of Education since 1999. The General Assembly requested that the Board of Education develop an alternative pathway to teaching which would positively impact Virginia's teacher shortages. ODU was approached by the Department of Education to create and run the state's pilot Career Switcher Program. Since then, our program has trained hundreds of Career Switchers who have gone on to be valued educators in school districts statewide.

Varied program formats allow for extremely accelerated training, while accommodating participants who wish to remain employed in their current jobs while pursuing teacher licensure.

Level I preparation in instructional skills and classroom management is specific to content area and focuses on the "survival skills" of everyday classroom teaching. Opportunities for in-school observation offers participants the opportunity to make contacts in school districts while gaining knowledge about teacher responsibilities and instructional strategies.

The ODU Career Switcher Program, while offered in a non-credit format, will transfer six hours of experiential graduate academic credit toward a Master of Science in Education degree through the Darden College of Education. Career Switchers who engage in additional coursework may qualify to transfer more than six hours pending program approval.

Upon completion of Level I preparation, ODU Career Switchers will receive a Provisional License which qualifies them to teach in the Commonwealth of Virginia. The renewable Collegiate Professional Teacher License will be issued upon completion of Level II.

Programs for Continued Learning

122 Education Building
757-683-4686, 1-800-262-0009
<http://education.odu.edu/pcl/>

Fran Puchalski, Co-Director

The department operates as the continuing education operation for the Darden College of Education. In this capacity, the office provides professional and personal noncredit programs. Program offerings range from alternative teacher certification, short courses, workshops, and institutes as well as offering educational training and conferences for educators and

counselors. The services we provide assist individuals seeking to gain knowledge and individual satisfaction in their professional and private lives.

The Child Study Center

139 Child Study Center
757-683-3081
<http://education.odu.edu/esse/academics/specprog/lions.shtml>

Jane Elyce Glasgow, Director

The Lions Child Study Center, located on Hampton Boulevard on the Old Dominion University campus, serves as a cooperative link among the University, community, and early childhood, special education and speech pathology/audiology programs of the University. In conjunction with its mission of urban outreach, the center provides in-service education, consultation, and clinical services to the local community, agencies, institutions, and school systems. In addition to serving as a visible community resource for referral and information, the center also conducts on-site demonstrations for training and informational exchange, provides parent training, tutorial and assessment services, and develops intervention and service models.

Programs for Children

Mission Statement

Old Dominion University's primary purpose in the children's programs at the Child Development and Child Study Centers is to train teacher candidates and provide a setting for research conducted by the University community. A secondary mission is to provide exemplary child care for the greater Hampton Roads community.

The Child Development Center

The Old Dominion University Child Development Center is a full-service, full-time program offering quality care for children ages eight weeks through kindergarten. In each of seven classrooms, a lead teacher is assisted by practicum students from early childhood and other academic areas of study. The lead teacher is a master's-level professional, trained to be knowledgeable about and attentive to the individual needs of children. Teacher aides also are employed to work in the center and are chosen from students in various disciplines who are trained and interested in working with young children. The Child Development Center provides care for children 49 weeks of the year from 7:30 a.m. to 5:30 p.m. and is housed in two locations: 1520 West 48th Street (the five classes for younger children) and the Child Study Center on 45th Street (the two classes for the oldest children).

The Preschool/Kindergarten Program

The Preschool/Kindergarten Program operates three hours a day, five days a week and emphasizes developmentally appropriate practices for children ages 3-5. The overall curriculum includes art, music, science, reading and math readiness, physical education, and computers. Children of kindergarten age are given a specific readiness program in preparation for their entrance into first grade. Lead teachers are assisted by graduate practicum students from early childhood education, as well as students from other academic areas of study, including speech-language pathology, psychology, leisure studies, elementary education and special education.

Speech and Hearing Clinic

Lions Child Study Center
757-683-4117
<http://education.odu.edu/shc/>

The Speech and Hearing Clinic including the Scottish Rite Center provides diagnostic and remedial clinical services to speech-language and hearing impaired children and adults. It operates on a twelve-month, five day per week schedule. Referrals are accepted from medical and educational agencies. Speech-language services are provided by advanced undergraduate and graduate student clinicians in Old Dominion University's speech-language pathology program who are supervised by ASHA certified clinical faculty members. Audiology services are provided by clinical faculty

members holding ASHA certification and by student clinicians who are supervised by these clinical faculty members. Clients typically served by the clinic display hearing, language, voice, fluency (stuttering) and articulation disorders as well as characteristics of social and foreign dialects.

Frank Batten College of Engineering & Technology

www.eng.odu.edu/

102 Kaufman Hall
757-683-3789

Oktay Baysal, Dean

Shirshak K Dhali, Associate Dean
Linda Vahala, Associate Dean

Ph.D.

- Aerospace Engineering
- Biomedical Engineering
- Civil and Environmental Engineering
- Electrical and Computer Engineering
- Engineering Management
- Mechanical Engineering
- Modeling and Simulation

D. Eng.

- Aerospace Engineering
- Civil and Environmental Engineering
- Engineering Management and Systems Engineering
- Mechanical Engineering
- Modeling and Simulation

Master's

- Aerospace Engineering
- Civil Engineering
- Biomedical Engineering
- Electrical and Computer Engineering
- Engineering Management
- Environmental Engineering
- Mechanical Engineering
- Modeling and Simulation
- Systems Engineering

Accelerated Degree Programs

Accelerated Bachelor's/Master's Degree Programs
Direct Bachelor's-to-Ph.D. and Integrated Bachelor's/Ph.D. Programs

Graduate Certificate Programs

- Advanced Engineering Certificate in
 - Biomedical Engineering
 - Cyber Systems Security
 - Energy Systems
 - Engineering Management
 - Naval Architecture and Marine Engineering
- Coastal Engineering Certificate
- Modeling and Simulation Engineering Certificate

Collaborative Programs

Commonwealth Graduate Engineering Program (CGEP)

Virginia Consortium for Engineering and Science Universities (VCES)

Mission Statement

In accordance with the mission of Old Dominion University, the Frank Batten College of Engineering and Technology promotes the advancement

of engineering knowledge, both by its creation and dissemination and by providing successful graduates and a continuously improving learning environment to its constituents, while maintaining ethical, multicultural and global standards.

Overview

The Frank Batten College of Engineering and Technology at Old Dominion University offers degrees in engineering and engineering technology.

The graduate engineering programs at Old Dominion University are specifically designed to take advantage of and enhance unique assets in the Hampton Roads area, a complex of seven major cities. These assets include: 1) a strong military presence with multiple high technology facilities, particularly as it relates to modeling and simulation; 2) the NASA Langley Research Center with its focus on aeronautics and space exploration; 3) the Jefferson Laboratories, a major center of nuclear physics and home of a major Free Electron Laser; 4) one of the major international deepwater ports on the east coast of the United States; 5) a major ship building and ship repair industry, including Newport News Shipbuilding, the only builder of nuclear aircraft carriers in the U.S.; 6) a major high technology industry base; and 7) a variety of commercial enterprises. These assets have enabled the development of distinctive engineering curricula.

Programs of Study

Table 1 lists the programs of study offered at master's and/or doctoral levels.

Table 1: Graduate Degrees Offered

Programs of Study	Master of Science (MS)	Master of Engineering (ME)	Doctor of Philosophy (PhD)	Doctor of Engineering (DEng)
Aerospace Engineering (AE)	X	X	X	X
Biomedical Engineering (BME)		X	X	
Civil Engineering (CE)	X	X		
Civil and Environmental Engineering (CEE)			X	X
Electrical and Computer Engineering (ECE)	X	X	X	
Engineering Management (ENMA)	X	X*	X	
Engineering Management and Systems Engineering (EMSE)				X
Environmental Engineering (ME)	X	X		
Mechanical Engineering (ME)	X	X	X	X
Modeling & Simulation (MSIM)	X	X	X	X
Systems Engineering (SysE)		X		

* Degree title is Master of Engineering Management (MEM).

Master's-Level Programs

Admission Information

Each program requires a bachelor's degree in the appropriate field from an accredited institution of higher education and the submission of Graduate Record Examination (GRE) scores. The GRE requirement is waived for the master's program in civil engineering and environmental engineering if the applicant holds an ABET accredited engineering degree from an institution in the USA. Each applicant must submit an essay of 500 words or less describing personal and academic goals, professional objectives, preparation for graduate study, and how the chosen program will help the applicant achieve these goals and objectives. Two letters of recommendation must be submitted from former or current professors except in civil engineering, environmental engineering and engineering management where letters from employment supervisors are also accepted. Regular admission to a master's program generally requires an undergraduate GPA of 3.0 or higher on a 4.0 scale. Applicants with a lower undergraduate GPA may be considered for regular or provisional admission on the basis of successful engineering work experience or other credentials demonstrating potential for success in the graduate program. Provisional admission may also be possible for applicants with a bachelor's degree in a field other than the applicant's intended graduate program. In such cases there will be pre-requisite course requirements. Exceptions to these requirements require consultation with the appropriate graduate program director.

Degree Requirements

Master's degree requirements in various programs are summarized in Table 2 for non-thesis options and in Table 3 for thesis options. In these tables the program abbreviations are: AE-Aerospace Engineering, BME-Biomedical Engineering, CE-Civil Engineering, EnvE-Environmental Engineering, ECE-Electrical and Computer Engineering, ME-Mechanical Engineering, ENMA-Engineering Management, SysE-Systems Engineering, and MSIM-Modeling and Simulation.

Table 2. Master of Engineering and Master of Engineering Management Degree minimum Requirements

AE Minimum Requirements

Semester Credits of Course Work	30
Semester Credits of Research	0
Total Credits	30
Course Work Semester Credits of Graduate Math/Stat	3
Course Work Semester Credits in Major	24
Course Work Semester Credits at 600 Level or Above	24
Comprehensive Exam - written	

BME Minimum Requirements

Semester Credits of Course Work	30
Semester Credits of Research	0
Total Credits	30
Course Work Semester Credits of Graduate Math/Stat	0
Course Work Semester Credits at 600 Level or Above	15
Course Work Semester Credits in Major	18
Comprehensive Exam - written	

CE Project Option Minimum Requirements

Semester Credits of Course Work	30
Semester Credits of Research	3
Total Credits	30
Course Work Semester Credits of Graduate Math/Stat	3
Course Work Semester Credits in Major	15
Course Work Semester Credits at 600 level or Above	18
Comprehensive Exam - oral project exam	

CE Course Option Minimum Requirements

Semester Credits of Course Work	30
Semester Credits of Research	0
Total Credits	30
Course Work Semester Credits of Graduate math/Stat	3
Course Work Semester Credits in Major	18
Course Work Semester Credits at 600 Level or Above	18
Comprehensive Exam - oral	

EnvE Project Option Minimum Requirements

Semester Credits of Course Work	27
Semester Credits of Research	3
Total Credits	30
Course Work Semester Credits of Graduate Math/Stat	3
Course Work Semester Credits in Major	15
Course Work Semester Credits at 600 Level or Above	18
Comprehensive Exam - oral project exam	

EnvE Course Option Minimum Requirements

Semester Credits of Course Work	30
Semester Credits of Research	0
Total Credits	30
Course Work Semester Credits of Graduate Math/Stat	3
Course Work Semester Credits in Major	18
Course Work Semester Credits at 600 Level or Above	18
Comprehensive Exam - written	

ECE Project Option Minimum Requirements

Semester Credits of Course Work	27
Semester Credits of Research	3
Total Credits	30
Course Work Semester Credits of Graduate Math/Stat	3
Course Work Semester Credits in Major	15
Course Work Semester Credits at 600 Level or Above	18
Comprehensive Exam - oral project exam	

ECE Course Option Minimum Requirements

Semester Credits of Course Work	30
Semester Credits of Research	0
Total Credits	30
Course Work Semester Credits of Graduate Math/Stat	3
Course Work Semester Credits in Major	18
Course Work Semester Credits at 600 Level or Above	18
Comprehensive Exam -written	

ME Project Option Minimum Requirements

Semester Credits of Course Work	27
Semester Credits of Research	3
Total Credits	30
Course Work Semester Credits of Graduate Math/Stat	3
Course Work Semester Credits in Major	18
Course Work Semester Credits at 600 Level or Above	18
Comprehensive Exam - oral project exam	

ME Course Option Minimum Requirements

Semester Credits of Course Work	30
Semester Credits of Research	0
Total Credits	30
Course Work Semester Credits of Graduate Math/Stat	3
Course Work Semester Credits in Major	18

course Work Semester Credits at 600 Level or Above	18
Comprehensive Exam - written	
ENMA Minimum Requirements	
Semester Credits of Course Work	31
Semester Credits of Research	0
Total Credits	31
Course Work Semester Credits of Graduate Math/Stat	0
Course Work Semester Credits in Major	31
Course Work Semester Credits at 600 Level or Above	31
Comprehensive Exam - project exam	

MSIM Minimum Requirements

Semester Credits of Course Work	30
Semester Credits of Research	0
Total Credits	30
Course Work Semester Credits of Graduate Math/Stat	3
Course Work Semester Credits in Major	15
Course Work Semester Credits at 600 Level or Above	18
Comprehensive Exam - written	

SysE Minimum Requirements

Semester Credits of Course Work	31
Semester Credits of Research	0
Total Credits	31
Course Work Semester Credits of Graduate Math/Stat	0
Course Work Semester Credits in Major	21
Course Work Semester Credits at 600 Level or Above	31
Comprehensive Exam - project exam	

Table 3. Master of Science Degree Minimum Requirements

AE

Semester Credits of Course Work	24
Semester Credits of Research	6
Total Credits	30
Course Work Semester Credits of Graduate Math/Stat (600 Level or above)	3
Course Work Semester Credits in Major	18
Course Work Semester Credits at 600 Level or Above	18
Comprehensive Exam - Thesis defense	

CE

Semester Credits of Course Work	24
Semester Credits of Research	6
Total Credits	30
Course Work Semester Credits of Graduate Math/Stat	3
Course Work Semester Credits in Major	12
Course Work Semester Credits at 600 Level or Above	15
Comprehensive Exam - Thesis defense	

EnvE

Semester Credits of Course Work	24
Semester Credits of Research	6
Total Credits	30
Course Work Semester Credits of Graduate Math/Stat	3
Course Work Semester Credits in Major	12
Course Work Semester Credits at 600 Level or Above	15
Comprehensive Exam - Thesis defense	

ECE

Semester Credits of Course Work	24
Semester Credits of Research	6
Total Credits	30
Course Work Semester Credits of Graduate Math/Stat (600 level or above)	3
Course Work Semester Credits in Major	18
Course Work Semester Credits at 600 Level or Above	18
Comprehensive Exam - Thesis Defense	

ME

Semester Credits of Course Work	24
Semester Credits of Research	6
Total Credits	30
Course Work Semester Credits of Graduate Math/Stat (600 level or above)	3
Course Work Semester Credits in Major	18
Course Work Semester Credits at 600 level or Above	18
Comprehensive Exam - Thesis defense	

ENMA

Semester Credits of Course Work	27
Semester Credits of Research	6
Total Credits	33
Course Work Semester Credits of Graduate Math/Stat	0
Course Work Semester Credits in Major	27
Course Work Semester Credits at 600 Level or Above	24
Comprehensive Exam - Thesis defense	

MSIM

Semester Credits of Course Work	24
Semester Credits of Research	6
Total Credits	30
Course Work Semester Credits of Graduate Math/Stat	3
Course Work Semester Credits in Major	15
Course Work Semester Credits at 600 Level or Above	18
Comprehensive Exam - Thesis defense	

Accelerated Bachelor's/Master's Degree Programs

These programs are designed to allow qualified students to secure a space in a Master's program available in the Frank Batten College of Engineering and Technology while they are still pursuing their undergraduate degrees. An eligible student can choose a Master's program in the same discipline as his/her Bachelor's program or in a complementary discipline. Subject to the approval of the undergraduate and graduate program directors, a student enrolled in an accelerated program can count up to six credit hours of course work towards both the undergraduate and the graduate degrees. Full-time students can complete the requirements for the Bachelor's degree in four years and for the Master's degree in one additional year.

Students who are matriculated in an undergraduate major in the Frank Batten College of Engineering and Technology with a GPA of at least 3.00 overall and 3.00 in the major are eligible to apply for admission to an accelerated Bachelor's/Master's program. Transfer students who desire to be admitted to an accelerated program at the time they join an undergraduate major at Old Dominion University are eligible to apply if their overall GPA at their previous institution is 3.25 or higher. Pre-requisite courses may be required for engineering technology majors to pursue a Master's degree in engineering.

Continuance in an accelerated Bachelor's/Master's program requires maintenance of a GPA of 3.00 or higher overall and in the major.

Doctor of Philosophy Programs

Admission Information

In addition to general University admission requirements, applicants must have a master's degree or equivalent and a grade point average of 3.50 in the appropriate field from an accredited institution of higher education. Additional requirements are listed in Table 4. The Graduate Record Examination (GRE) General Test is required of all applicants; the GRE requirement is waived for applicants in the Ph.D. programs of civil engineering and environmental engineering if the applicant holds an ABET-accredited engineering degree or graduate engineering degree from an institution of which the undergraduate degree is ABET-accredited. Each applicant must submit an essay of 500 words or less describing personal and academic goals, professional objectives, preparation for graduate study, and how the chosen program will help the applicant achieve these goals and objectives. All applicants must submit two letters of recommendation. Letters of recommendation must be from current professors. Engineering management applicants may submit letters from employment supervisors. Civil engineering and environmental engineering applicants are permitted to submit one of the two letters from an employment supervisor.

Table 4. Ph.D. Degree Admission Requirements

Minimum Requirements	GPA (previous graduate work) for provisional admission	Letter of Recommendation
AE	3.25	2
BME	3.25	2
CEE	3.25	2
ECE	3.25	2
ME	3.25	2
ENMA	3.50	2 (interview required)
MSIM	3.25	3

Degree Requirements

Table 5 lists requirements that are imposed by the Batten College of Engineering and Technology.

Table 5. Ph.D. Degree Requirement

Minimum Requirements	Course Work Semester Credit Hours	Dissertation Hours	Foreign Language Requirement
AE	24	24	May apply as research skill
BME	24	24	None
CEE	24	24	None
ECE	24	24	None
ME	24	24	May apply as research skill
ENMA	27	24	None
MSIM	24	24	None

Direct Bachelor-to-Ph.D. and Integrated Bachelor/Ph.D. Programs

For a select number of exceptionally well-qualified students, the college has established an accelerated doctoral program that enables students to be admitted directly into the Ph.D. program upon completion of the baccalaureate degree. The total number of graduate course credits required is 48 plus a 24-credit dissertation. That is six credit hours shorter than the regular path, where a student obtains a master's degree and then pursues Ph.D. study. The philosophy of the college is that the quality of the dissertation is judged more by the quality of research performed, rather than by the number of courses taken.

A select number of exceptionally well-qualified students can be admitted to the Integrated Bachelor/Ph.D. program while they are pursuing their junior year in one of the undergraduate programs at Old Dominion University.

This program encourages admitted students to work closely with individual faculty members during the remainder of their undergraduate program. Just as in the accelerated Bachelor's/Master's program, six credit hours of graduate course work may again be counted toward the undergraduate degree and doctoral course work mentioned above for the integrated Bachelor/Ph.D. program. Therefore, the total graduate credit hours after obtaining the bachelor's degree at Old Dominion can be 42 credit hours of graduate courses plus a 24-credit dissertation. That is 12 credits shorter than the regular path. Students in these programs must maintain a GPA of 3.50 or better throughout their bachelor's and doctoral studies.

The student may opt to obtain the master's degree along the way to the doctorate. To obtain the master's degree, the student must utilize the six graduate credits obtained as part of their undergraduate program, use 18 credits of the graduate course work that is part of the Ph.D., and also write a master's thesis.

Doctor of Engineering Program

The College offers an interdisciplinary Doctor of Engineering (D.Eng.) program to provide the Commonwealth and the nation with exceptionally educated engineering practitioners. These individuals will have developed the highest possible capability to provide innovative solutions in specialized engineering endeavors. The graduates of the program will meet the highest standards for advanced level engineering and leadership positions in industry and government.

Curriculum

A minimum of 48 hours of graduate work beyond the master's degree is required including:

- 18 credit hours of core courses
- At least 18 credit hours of graduate coursework in the student's area of specialization
- At least 12 credit hours of applied doctoral project

At least three fifths of the course work must be at 800-level. The 18 credit hours of core courses are:

ENMA 604	Project Management	3
ENGN 611	Financial Engineering	3
ENGN 612	Analysis of Organizational Systems	3
ENGN 811	Methodologies for Advanced Engineering Projects	3
ENGN 812	Engineering Leadership	3
ENGN 813	Engineering Ethics	3
Total Hours		18

Five specialization areas are available:

1. Aerospace Engineering
2. Civil and Environmental Engineering
3. Engineering Management and Systems Engineering
4. Mechanical Engineering
5. Modeling and Simulation

Admission Criteria

Consideration for admission to the Doctor of Engineering program requires a formal application, undergraduate and graduate transcripts, and two letters of recommendation. Also required is an essay describing the applicant's preparation for graduate work, personal and academic goals, and professional objectives. One of the letters of recommendation should be from an agency point of contact if a sponsoring agency is involved. Sponsorship does not necessarily imply financial support, but it rather focuses on the provision of a project and access to data, information, and means to apply and test a solution. A personal or telephone interview of the applicant with the graduate program director will be required.

The minimum eligibility requirements for regular admission to the Doctor of Engineering program are: engineering experience of at least two years within

the last five years and a master's degree with a grade point average of 3.50 out of 4.00 in an appropriate field from an accredited institution of higher education.

Continuation and Graduation Requirements

The continuation requirements are the same as the continuation requirements for the Doctor of Philosophy programs. The graduation requirements for the Doctor of Engineering degree are as follows:

1. Satisfactory completion of a minimum of 48 credit hours of approved graduate work beyond the master's degree, including the doctoral project.
2. Satisfactory performance on a diagnostic examination at the completion of nine credit hours of coursework. The purpose of this examination is to determine if the student has adequate background to pursue a doctoral degree. The diagnostic examination may only be repeated once.
3. Satisfactory completion of a written and oral candidacy examination. The student will take the candidacy examination when he/she is within six credit hours of completing all the required coursework. The candidacy examination may only be repeated once.
4. Preparation and successful defense of a project concept proposal. The student will be required to prepare and present a concept proposal related to the work that will be undertaken for the doctoral project. The concept proposal will be defended before the doctoral committee.
5. Submission of progress reports as deemed necessary by the doctoral committee.
6. Written report of the project results. The doctoral project shall be documented in a manner consistent with advanced, professional work. The project report will follow the standard format for Old Dominion University dissertations and theses.
7. Comprehensive oral defense of the doctoral project before the student's doctoral committee and a general audience.

The applied doctoral project must successfully demonstrate the student's mastery of the subject area and his/her ability to apply advanced technical knowledge to identify, formulate, and solve novel and complex engineering problems. The project must address a complex but practical problem currently faced by the public, industry, or government, and it must provide a solution that satisfies all the technical, social, political, economic, safety, sustainability, and environmental requirements and/or constraints. The doctoral project committee will have at least three Old Dominion University faculty members certified for graduate instruction; two faculty members must be from the major department. The committee must also have at least one non-University person with special knowledge of the project subject area.

Additional Graduate Degrees Policy

Graduate students may pursue an additional graduate degree in any discipline at Old Dominion University. Such a degree may be sought subsequent to or concurrently with another degree. Students may request that up to six credit hours of graduate level course work used to fulfill requirements for one Master's degree offered by the Batten College of Engineering and Technology be applied to another Master's program offered by the College. Approval of the appropriate graduate program directors and college dean is required. Course work used to fulfill requirements for another graduate degree cannot be applied to a doctoral degree offered by the Batten College of Engineering and Technology.

Interdisciplinary Certificate Programs

Advanced Engineering Certificate

The Advanced Engineering Certificate Program consists of 12 credit hours of graduate level course work. The four courses comprising the certificate program are offered on a regular schedule to enable the completion of the program in two years. The program provides the opportunity for practicing engineers to further their knowledge and become more competent in their profession. The following tracks are available,

1. **Cyber Systems Security** - The certificate program aims to provide a thorough understanding of the cyber security threats faced by the stand-

alone computer systems, networked systems, IT infrastructure, and cyber physical systems having embedded computer systems operated by individuals, small businesses and large enterprises along with the knowledge required to defend against these threats.

2. **Energy Systems** - The certificate program provides an opportunity to students in STEM fields and industry personnel with undergraduate degree in STEM fields to learn about energy systems or pursue job markets in energy industries,

Program Requirements

Admission to the program requires a Bachelor of Science degree in engineering (or equivalent). The certificate consists of four pre-approved graduate level courses contributing to an emphasis area that can be interdisciplinary. A grade point average of 3.0 or better is required to earn the certificate.

Biomedical Engineering Program

231 Kaufman Hall
www.eng.odu.edu/bme

Dean Krusienski, Graduate Program Director

Degree Programs

Master of Engineering in Biomedical Engineering

Ph.D. – Biomedical Engineering Emphasis

Certificate Program

Advanced Engineering Certificate in Biomedical Engineering

Degrees Description

The Biomedical Engineering graduate degree programs are available to full-time and part-time students seeking to improve their research and professional skills in biomedical engineering. The programs strive to provide the highest quality engineering education at the graduate level, to engage in scholarly research at the forefront of biomedical engineering, and to serve the profession of biomedical engineering. Cutting-edge research opportunities and instruction are offered in:

Bioelectrics

Encompasses the study of endogenous electrical phenomena and externally induced electromagnetic field effects in biological systems, particularly human tissue and organs. Research includes the interaction of pulsed electromagnetic fields and ionized gases with biological systems, mapping of cardiac electrophysiology, and brain-computer interfaces.

Facilities

Frank Reidy Center for Bioelectrics, Advanced Signal Processing in Engineering and Neuroscience (ASPEN) Laboratory, Cardiac Electrophysiology Laboratory, Medical Device Laboratory.

Biomechanics and BioMicro/NanoFluidics

Encompasses the study of macro, micro, and nano-scale solid and fluid mechanics in biological systems, particularly human tissue and organs. Research includes point-of-care microfluidic devices, orthopedic biomechanics, rehabilitation engineering, biomechanics of trauma, and micromechanical analysis of soft tissue.

Facilities

BioMicro Fluidics Laboratory, Center for Brain Research and Rehabilitation, Biomechanics Laboratory.

Biomedical Imaging

Utilizes ODU's diverse resources in computer-based imaging, visualization and simulation. Research includes medical imaging and analysis, modeling of human physiology, and development of virtual medicine tools and software.

Facilities

Medical Imaging Diagnostics and Analysis (MIDA) Laboratory, Virginia Modeling Analysis and Simulation Center, Cardiac Electrophysiology Laboratory, Advanced Signal Processing in Engineering and Neuroscience (ASPEN) Laboratory.

Biomedical Instrumentation

Utilizes ODU's significant resources in engineering design and fabrication to develop new technologies for research and clinical applications. Includes development of biosensors, fiber optic-based devices, stimulation and ablation technologies and surgical instrumentation.

Facilities

Micro-Nano Fabrication Laboratory, Photonics Laboratory, and Rapid Prototyping Laboratories.

The program also has strong ties to several other on- and off-campus laboratories including the Laser and Plasma Engineering Institute, Center for Advanced Engineering Environments, Computational Intelligence and Machine Vision Laboratory, and Applied Research Center at the Jefferson National Laboratory. These unique resources position the biomedical engineering program to be a leader in education and research in the Southeast and nationally.

Master of Engineering in Biomedical Engineering

Master of Engineering Admission Requirements

Admission to the Master of Engineering program in biomedical engineering is in accordance with Old Dominion University and Frank Batten College of Engineering and Technology requirements for master's programs as specified in this catalog. Specific additional requirements include the following:

1. Completion of a bachelor's degree in Engineering, Science or Mathematics from an accredited institution, although students from other educational backgrounds may apply with appropriate leveling courses.
2. A minimum GPA of 3.00 (out of 4.0) is required of most students. A student with a lower GPA meeting ODU's graduate admission requirements and with evidence of a high level of professional capability may be eligible for admission to the program upon submission of a petition to the graduate program director.
3. Recent scores, typically, not more than five years old, on the Graduate Record Examination's (GRE) verbal, quantitative, and analytical writing sections must be submitted by all applicants.
4. Two letters of recommendation (typically from faculty in the highest degree program completed when the application is within five years of graduation from that degree program) are required.
5. The applicant must submit a resume and a statement of purpose and goals.
6. Foundation knowledge in physics, basic chemistry, computer programming, and mathematics is expected.

Master of Engineering Degree Requirements

The Master of Engineering program requires completion of 10 three-credit courses: two BME fundamentals courses, a graduate physiology course, and seven technical electives. The seven technical electives should be chosen to meet the student's career objectives.

BME Fundamentals *		6
BME 501	Biomedical Engineering I: Principles	
BME 502	Biomedical Engineering II: Applications	
Physiology Requirement (choose one)		3
BIOL 590	Advanced Human Physiology	
BIOL 700	Cardiovascular Physiology	
BIOL 724	Neuromuscular Physiology	

BIMD 708	Medical Neuroscience	
BIMD 715	Human Physiology I	
BIMD 716	Human Physiology II	
BME Technical Electives (choose four)		12
BME 505	Biomechanics	
BME 508	Microfluidics	
BME 510	Biomedical Instrumentation	
BME 554	Introduction to Bioelectrics	
BME 630	Advanced Bioelectrics	
BME 720	Modern Biomedical Instrumentation	
BME 721	Quantitative Analysis of Human Physiological Systems I	
BME 722	Quantitative Analysis of Human Physiological Systems II	
BME 724	Neural Engineering	
BME 751	Biostatistics: Fundamentals and Applications	
BME 795	Special Topics in Biomedical Engineering	
Approved Technical Electives **		9
Total Hours		30

* Students who have completed BME 401 or BME 402 as part of a previous degree, program, or minor may substitute these courses with graduate-level BME electives approved by the graduate program director.

** The technical elective courses can be selected from the biomedical engineering technical electives or a wide variety of appropriate graduate courses in engineering, biology, chemistry, psychology, computer science, modeling and simulation, mathematics, statistics, or other programs. Technical electives without the BME prefix must be approved by the graduate program director.

Doctor of Philosophy - Biomedical Engineering Emphasis

Doctor of Philosophy Admission Requirements

Admission to the Ph.D. program in biomedical engineering is in accordance with Old Dominion University and Frank Batten College of Engineering and Technology requirements for doctoral programs as specified in this catalog. Specific additional requirements include the following:

1. Completion of a master's degree in a closely related field is expected. However, students who have completed 24 credits of graduate courses in an appropriate field from an accredited institution or have demonstrated an exceptionally high level of academic capability may petition for direct admittance into the program.
2. A minimum GPA of 3.50 (out of 4.0) is required of most students. A student with a lower GPA meeting ODU's graduate admission requirements and with evidence of a high level of professional capability may be eligible for admission to the program upon submission of a petition to the graduate program director.
3. Recent scores, typically, not more than five years old, on the Graduate Record Examination's (GRE) verbal, quantitative, and analytical writing sections must be submitted by all applicants.
4. Three letters of recommendation (typically at least two of which are from faculty in the highest degree program completed when the application is within five years of graduation from that degree program) are required.
5. The applicant must submit a resume and a statement of purpose and goals.
6. Foundation knowledge in physics, basic chemistry, computer programming, and mathematics is expected.

Doctor of Philosophy Degree Requirements

The Ph.D. in biomedical engineering is offered in accordance with the general requirements for doctoral degrees as specified in the Requirements

for Graduate Degree Section of this catalog. Specific program of study requirements include the following:

1. Completion of a minimum of 48 hours of graduate credits to include: a minimum of 24 credits of course work beyond the master's degree and a minimum of 24 credits of dissertation research. At least 15 credits of non-dissertation course work must be at the 800-level.
2. Successful completion of a written diagnostic examination before the end of the first academic year.
3. Successful completion of a written and oral qualifying examination near the completion of the coursework.
4. Successful presentation of a dissertation research proposal at the beginning of the dissertation research.
5. The successful completion and public defense of a dissertation representing independent, original research worthy of publication in a peer-reviewed scholarly journal.

The program of study will be developed with the approval of the graduate program director and the student's advisor. The program shall include a common core of 12 credits and 12 credits of technical electives.

Common Core *	12
BME 820	Modern Biomedical Instrumentation
BME 821	Quantitative Analysis of Human Physiological Systems I
BME 822	Quantitative Analysis of Human Physiological Systems II
BME 851	Biostatistics: Fundamentals and Applications
Technical Electives **	12
BME 501	Biomedical Engineering I: Principles
BME 502	Biomedical Engineering II: Applications
BME 505	Biomechanics
BME 508	Microfluidics
BME 510	Biomedical Instrumentation
BME 554	Introduction to Bioelectronics
BME 630	Advanced Bioelectronics
BME 824	Neural Engineering
BME 895	Special Topics in Biomedical Engineering
ECE 562	Introduction to Medical Image Analysis (MIA)
ECE 564	Biomedical Applications of Low Temperature Plasmas
Total Hours	24

* Students who have completed any of the core courses at the 700-level as part of a previous degree or program may substitute these courses with 800-level BME electives approved by the graduate program director.

** The technical elective courses provide a basis for dissertation research and future career objectives. These courses can be selected from the biomedical engineering technical electives or a wide variety of appropriate graduate courses in engineering, biology, chemistry, psychology, computer science, modeling and simulation, mathematics, statistics, or other programs. No more than six credits from course work satisfying foundation knowledge requirements may be included in the program of study for elective credit. At least 15 credits of non-dissertation course work must be at the 800-level. A minimum of 3 credits must be selected from the biomedical engineering technical electives list; the remaining credits can be selected from this list or other graduate courses with approval of the student's advisor and the graduate program director.

Advanced Engineering Certificate in Biomedical Engineering

The Graduate Certificate in Biomedical Engineering Program offers students and professionals the opportunity to further their knowledge with advanced

study in the growing area of Biomedical Engineering. The program is designed to provide well-rounded instruction in several key facets of Biomedical Engineering. Those who complete the Program receive the Advanced Engineering Certificate in Biomedical Engineering from Old Dominion University and a letter of recognition from the Batten College of Engineering and Technology. Courses taken for the certificate program may later be applied to the Ph.D. degree in Biomedical Engineering.

Certificate Program Admission Requirements

- Bachelor of Science degree (or equivalent) in an engineering field or undergraduate degree in another relevant STEM field.
- Prerequisites for applicants from non-engineering fields include college-level mathematics, calculus-based physics, and chemistry or biology.
- Students enrolled in the Biomedical Engineering Ph.D. or Master of Engineering programs at ODU are not eligible for the certificate.

Certificate Program Curriculum Requirements

- Twelve credit hours of graduate course work
- A grade point average of 3.0 or better

BME Fundamentals *	6
BME 501	Biomedical Engineering I: Principles
BME 502	Biomedical Engineering II: Applications
BME Electives (select two) **	6
BME 505	Biomechanics
BME 508	Microfluidics
BME 510	Biomedical Instrumentation
BME 554	Introduction to Bioelectronics
BME 630	Advanced Bioelectronics
BME 720	Modern Biomedical Instrumentation
BME 721	Quantitative Analysis of Human Physiological Systems I
BME 724	Neural Engineering
ECE 562	Introduction to Medical Image Analysis (MIA)
ECE 564	Biomedical Applications of Low Temperature Plasmas
Total Hours	12

* Students who have completed BME 401 or BME 402 as part of a previous degree, program, or minor may substitute these courses with graduate-level BME electives approved by the graduate program director.

** Appropriate course substitutions may be considered with permission of the graduate program director.

Department of Civil and Environmental Engineering

135 Kaufman Hall
757-683-3753
<http://eng.odu.edu/cee>

Gary Schafran, Chair
Isao Ishibashi, Graduate Program Director

Degree Programs

The department offers the following graduate degrees:
Master of Science in Civil Engineering
Master of Engineering in Civil Engineering
Master of Science in Environmental Engineering
Master of Engineering in Environmental Engineering
Ph.D. in Civil and Environmental Engineering
Doctor of Engineering in Civil and Environmental Engineering

Master's Degrees

In this rapidly changing technological world, graduate degrees are highly desirable and most often master's degrees are required to hold professional civil and environmental engineering positions in the industry, and in federal, state and municipal government agencies. The department's graduate programs are designed to educate the technological leaders of the future in civil and environmental engineering, and are structured to accommodate both full-time and part-time students. The specialty areas include coastal, geotechnical, structural, transportation and water resources engineering in civil engineering, and sub-fields in environmental engineering including water quality, water and wastewater treatment, hydrologic processes, water resources, environmental engineering microbiology, air quality, hazardous and solid waste, and pollution prevention. For additional information please request a departmental handbook from the graduate program director.

Master's Admission Information

In addition to general University admission requirements, applicants' bachelor degrees should be in civil engineering, environmental engineering or in engineering with a strong background in mathematics and physical sciences. Provisional admission will be given to those applicants who do not hold a bachelor's degree in civil or environmental engineering; however these students will be required to complete undergraduate course work in addition to the graduate program requirements. Potential prerequisite courses are listed below.

Potential Prerequisite Courses for M.S. and M.E. in Civil Engineering (other than Transportation Engineering):

MATH 211	Calculus I	4
MATH 212	Calculus II	4
MATH 307	Ordinary Differential Equations	3
MATH 312	Calculus III	4
PHYS 231N	University Physics	4
PHYS 232N	University Physics	4
CS 150 or CEE 305	Problem Solving and Programming I Civil and Environmental Computations	4
CEE 204	Statics	3
MAE 205	Dynamics	3
MAE 220	Engineering Mechanics II - Solid Mechanics	3
CEE 310	Structures I	3
CEE 323	Soil Mechanics	3
CEE 330	Hydromechanics	3
CEE 340	Hydraulics and Water Resources	3
CEE 410	Concrete Design I	3

Potential Prerequisites Courses for M.S. & M.E. in Civil Engineering (Transportation Engineering):

MATH 211	Calculus I	4
MATH 212	Calculus II	4
MATH 312	Calculus III	4
STAT 306	Introductory Statistics	3
PHYS 231N	University Physics	4
PHYS 232N	University Physics	4
CS 150 or CEE 305	Problem Solving and Programming I Civil and Environmental Computations	4

Potential Prerequisite Courses for M.S. & M.E. in Environmental Engineering:

MATH 211	Calculus I	4
MATH 212	Calculus II	4
MATH 307	Ordinary Differential Equations	3
MATH 312	Calculus III	4

PHYS 231N	University Physics	4
PHYS 232N	University Physics	4
CHEM 121N	Foundations of Chemistry I Lecture	3
CHEM 122N	Foundations of Chemistry I Laboratory	1
CHEM 123N	Foundations of Chemistry II Lecture	3
CS 150 or CEE 305	Problem Solving and Programming I Civil and Environmental Computations	4
CEE 330	Hydromechanics	3
CEE 340	Hydraulics and Water Resources	3
CEE 350	Environmental Pollution and Control	3

Civil Engineering and Environmental Engineering Graduate Course Requirements (except Transportation Engineering concentration):

The graduate courses applicable towards a master's degree in the Department of Civil and Environmental Engineering are grouped into various categories listed below. The required number of the credit hours from these categories for the Master of Science (M.S.) and the Master of Engineering (M.E.) degrees in Civil Engineering (except transportation engineering concentration) and in Environmental Engineering are summarized in Table CEE-1 and CEE-2, respectively. Note that for the M.S. option students must pass an oral thesis defense examination. For the M.E. project option students must pass an oral project defense examination. For the M.E. course option, student must pass an oral (for civil engineering) or written (for environmental engineering) comprehensive examination at the end of all course work.

Category A – Upper level courses in Civil Engineering

CEE 710	Structural Dynamics	3
CEE 711	Finite Element Analysis	3
CEE 712	Advanced Reinforced Concrete	3
CEE 713	Prestressed Concrete	3
CEE 714	Advanced Structural Analysis	3
CEE 715	Engineering Optimization I	3
CEE 717	Bridge Structures Design	3
CEE 719	Inelastic Structures	3
CEE 720	Structural Stability	3
CEE 721	Plates	3
CEE 722	Cluster Parallel Computing	3
CEE 723	Seismic Design of Steel Structures	3
CEE 724	Retrofitting Methods for Bridges and Buildings	3
CEE 730	Advanced Foundation Engineering	3
CEE 731	Advanced Soil Mechanics	3
CEE 732	Engineering Behavior of Soils	3
CEE 733	Soil Dynamics	3
CEE 741	Open Channel Flow *	3
CEE 747	Groundwater Flow *	3
CEE 761	Water Resources Process and Analysis Methods *	3
CEE 770	Transportation Safety	3
CEE 771	Transportation Operations II	3
CEE 772	Intelligent Transportation Systems	3
CEE 773	Transportation Planning	3
CEE 774	Transportation Network Flow Models	3
CEE 775	Computational Methods for Transportation Systems	3
CEE 776	Simulation in Transportation Networks	3
CEE 782	Design of Coastal Structures	3
CEE 783	Tidal Hydraulics in the Estuarine and Coastal Environment	3

CEE 787	Dredging and Beach Engineering	3
CEE 788	Coastal Hydrodynamics and Sediment Transport Processes *	3
CEE 789	Computational Environmental Fluid Dynamics	3

Category B – Upper level courses in Environmental Engineering

CEE 650	Pollution Prevention	3
CEE 659	Carbon-Free Clean Energy	3
CEE 700	Civil and Environmental Engineering Experimental Design #	3
CEE 741	Open Channel Flow *	3
CEE 747	Groundwater Flow *	3
CEE 751	Physicochemical Treatment Processes	3
CEE 752	Biological Wastewater Treatment	3
CEE 753	Advanced Processes for Water and Wastewater Treatment	3
CEE 754	Environmental Engineering Microbiology	3
CEE 755	Water Quality Management	3
CEE 756	Water Quality Modeling	3
CEE 761	Water Resources Process and Analysis Methods *	3
CEE 762	Aquatic Chemistry in Environmental Engineering	3
CEE 788	Coastal Hydrodynamics and Sediment Transport Processes *	3

Category C – Lower level courses in Civil & Environmental Engineering

CEE 511	Concrete Design II	3
CEE 514	Masonry Structures Design	3
CEE 515	Steel Structures Design	3
CEE 516	Wood Structures Design	3
CEE 530	Foundation Engineering	3
CEE 531	Earth Structures Design with Geosynthetics	3
CEE 532	Introduction to Earthquake Engineering	3
CEE 540	Hydraulic Engineering	3
CEE 546	Urban Stormwater Hydrology	3
CEE 547	Groundwater Hydraulics	3
CEE 550	Water Distribution and Wastewater Collection System Design	3
CEE 552	Air Quality	3
CEE 554	Hazardous Wastes	3
CEE 558	Sustainable Development	3
CEE 559	Biofuels Engineering	3
CEE 560	Advanced Analytical Techniques in Environmental Engineering	3
CEE 570	Transportation Fundamentals	3
CEE 571	Transportation Operations I	3
CEE 576	Transportation Operations Applications	3
CEE 582	Introduction to Coastal Engineering	3

Category D – Other graduate courses

Graduate level courses offered from other departments. These courses must be related to the program of study and must be approved by the student's academic advisor.

MATH or STAT Category

CEE 700 Civil and Environmental Engineering Experimental Design; or a graduate level MATH or STAT course.

* Double listings in A and B categories.

Double listings in B and STAT categories.

Table CEE-1. Required Course Distributions for M.S. and M.E. in Civil Engineering (except for Transportation Engineering Concentration)

M.S. - Thesis Option

Category	Credit Hours
A	12
A,B,C, or D	9
MATH/STAT	3
Thesis	6
Total	30*

M.E. - Project Option

Category	Credit Hours
A	15
A,B,C, or D	9
MATH/STAT	3
Project	3
Total	30*

M.E. - Course Option

Category	Credit Hours
A	15
A,B,C, or D	9
MATH/STAT	3
A or B	3
Total	30**

* For M.S. and M.E. Project options, no more than 9 credit hours can be at 500 level.

** For M.E. Course option, no more than 12 credit hours can be at 500 level.

Table CEE-2. Required Course Distributions for M.S. and M.E. in Environmental Engineering

M.S. - Thesis Option

Category	Credit Hours
B	12
A,B,C, or D	9
MATH/STAT	3
Thesis	6
Total	30*

M.E. - Project Option

Category	Credit Hours
B	15
A,B, C, or D	9
MATH/STAT	3
Project	3
Total	30*

M.E. - Course Option

Category	Credit Hours
B	15
A,B, C, or D	9
MATH/STAT	3
A or B	3
Total	30**

* For M.S. and M.E. Project options, no more than 9 credit hours can be at 500 level.

** For M.E. Course option, no more than 12 credit hours can be at 500 level.

Civil Engineering Graduate Course Requirements (in Transportation Engineering concentration):

The department offers Master of Science (M.S.) and Master of Engineering (M.E.) degrees in Civil Engineering with concentration in Transportation Engineering. Table CEE-3 summarizes the requirements for the M.S. and M.E. degrees in the Transportation Engineering concentration. Note that for the M.S. option students must pass an oral thesis defense examination. For the M.E. project option students must pass an oral project defense examination. For the M.E. course option, student must pass an oral comprehensive examination at the end of all course work.

Table CEE-3. Required Course Distributions for M.S. and M.E. in Civil Engineering – Transportation Engineering Concentration

M.S. - Thesis Option

Category	Credit Hours
Core Courses	9
Upper-Level Transportation Electives	3
Graduate Statistic Course	3
Other Electives	9
Thesis	6
Total	30*

M.E. - Project Option

Category	Credit Hours
Core Courses	9
Upper-Level Transportation Electives	3
Graduate Statistic Course	3
Other Electives	12
Project	3
Total	30*

M.E. - Course Option

Category	Credit Hours
Core Courses	9
Upper-Level Transportation Electives	6
Graduate Statistic Course	3
Other Electives	12
Total	30**

* Note: For M.S. and M.E. Project options, no more than 9 credit hours can be at 500 level.

** For M.E. Course Option, no more than 12 credits can be at the 500 level.

Courses in Transportation Engineering Concentration

Core Courses

CEE 570	Transportation Fundamentals
CEE 571	Transportation Operations I
CEE 773	Transportation Planning

Upper-level Transportation Electives

CEE 770	Transportation Safety
CEE 771	Transportation Operations II
CEE 772	Intelligent Transportation Systems
CEE 774	Transportation Network Flow Models

CEE 775	Computational Methods for Transportation Systems
CEE 776	Simulation in Transportation Networks
Statistics Course	
CEE 700	Civil and Environmental Engineering Experimental Design
Other Elective Courses	
CEE 770	Transportation Safety
CEE 771	Transportation Operations II
CEE 772	Intelligent Transportation Systems
CEE 774	Transportation Network Flow Models
CEE 775	Computational Methods for Transportation Systems
CEE 776	Simulation in Transportation Networks
and other approved electives - see table below	
Thesis/Project	
CEE 699	Thesis
CEE 698	Master's Project

Other Approved Electives

CEE 552	Air Quality	3
CEE 558	Sustainable Development	3
CEE 576	Transportation Operations Applications	3
CEE 715	Engineering Optimization I	3
ECON 502	Transportation Economics	3
MSIM 603	Simulation Design	3
ENMA 600	Cost Estimating and Financial Analysis	3
ENMA 603	Operations Research	3
ENMA 717	Cost Engineering	3
ENMA 724	Risk Analysis	3
MSIM 601	Introduction to Modeling and Simulation	3
PADM 633	Methods of Urban Planning	3
PADM 634	Regional Planning	3
PORT 611	International Maritime Transport	3
PORT 612	Port Operations and Management	3
PORT 614	Port Planning and Economics	3
PSYC 870	Human Factors Psychology	3
STAT 531	Theory of Statistics	3
STAT 532	Sampling Theory	3
STAT 535	Design and Analysis of Experiments	3
STAT 537	Applied Regression Analysis	3
STAT 549	Nonparametric Statistics	3

Doctor of Philosophy Degree

Doctoral degrees in civil engineering and environmental engineering are required for college-level teaching and employment in research institutions. Many leading industries and agencies also seek well-trained doctoral graduates. The specialty areas include coastal, geotechnical, structural, transportation, and water resources engineering in Civil Engineering and a variety of sub-fields in Environmental Engineering including water quality, water and wastewater treatment, hydrologic processes, water resources, environmental engineering microbiology, air quality, hazardous and solid waste, and pollution prevention.

Doctor of Philosophy Admission Requirements

A master's degree or equivalent in engineering or a related field is required for admission; however exceptionally well qualified students can be admitted to the doctoral program directly without a master's degree. In addition to general University admission requirements, submission of GRE scores is required except for applicants who hold an ABET accredited engineering degree from an institution in the USA or a graduate engineering degree from an institution of which the undergraduate degree is ABET

accredited in the USA. One of the two recommendation letters may be from an employment supervisor.

Doctor of Philosophy Degree Requirements

Refer to Table 5 for the college summary of degree requirements. Three-fifths (3/5) of the courses shall be from 800-level courses as required by the University.

Doctor of Engineering Degree

The Department offers a Doctoral of Engineering program (D.Eng.) with concentration in Civil and Environmental Engineering in accordance with the D.Eng. program criteria and requirements specified for the Batten College of Engineering and Technology in this catalog.

Certificate Programs

Coastal Engineering Certificate

David Basco, Director, Coastal Engineering Center

In order to provide the opportunity for practicing civil/coastal engineers to further their knowledge and to become more competent in their profession, the Department of Civil and Environmental Engineering offers a non-degree Coastal Engineering Certificate. Admission to the program requires a Bachelor of Science degree (or equivalent) in civil engineering, coastal engineering, or a related field (e.g. oceanography, geoscience). The program consists of the following four graduate courses (12 credit hours) that are taught over the course of two years (one each semester); these courses are made available on-line.

CEE 582	Introduction to Coastal Engineering (Spring)	3
CEE 782	Design of Coastal Structures (Fall, even years)	3
CEE 787	Dredging and Beach Engineering (Fall, odd years)	3
CEE 788	Coastal Hydrodynamics and Sediment Transport Processes (Spring, even years)	3
Total Hours		12

An overall grade point average of 3.00 or better is required to earn the certificate.

Department of Electrical and Computer Engineering

231 Kaufman Hall
757-683-3741

<http://eng.odu.edu/ece/>

Khan M. Iftekharruddin, Chair

Oscar González, Associate Chair

Dimitrie C. Popescu, Graduate Program Director

Degree Programs

The department offers the following graduate degrees:

- Master of Science in Electrical and Computer Engineering
- Master of Engineering in Electrical and Computer Engineering
- Ph.D. in Electrical and Computer Engineering

Degrees Description

The Department of Electrical and Computer Engineering strives to provide the highest quality engineering education at the undergraduate and graduate levels, to engage in scholarly research at the forefront of electrical and computer engineering, and to serve the profession of electrical and computer engineering. The department has strong graduate and research programs

providing a high quality and broad-based education that prepares graduates for successful professional careers and a lifetime of learning.

Electrical and computer engineering graduate studies encompass four broad areas:

1. systems
2. signal and image processing
3. physical electronics
4. and computer engineering

The research laboratories and institutes directly associated with the department include the Advanced Signal Processing in Engineering and Neuroscience Lab, the Plasma Engineering and Medicine Institute, the Medical Imaging Diagnostics and Analysis Laboratory, the Virginia Institute for Photovoltaics, the Systems Research Laboratory, the Virginia Institute for Vision Analysis, and the Wireless Communication and Networking Laboratory. In addition, the department has strong ties to several off-campus laboratories including the Applied Research Center at the Jefferson National Laboratory, the Frank Reidy Center for Bioelectrics, and the Virginia Modeling Analysis and Simulation Center. These research facilities position the department for national leadership in several areas and as a leading institution of research and higher education in the southeastern United States. For additional information, please visit our website at eng.odu.edu/ece.

Master of Science and Master of Engineering in Electrical and Computer Engineering

Master's Admission Information

Applicants are expected to hold a B.S. degree in electrical engineering (EE) or computer engineering (CpE) from an accredited institution. Applicants are also expected to have a minimum grade point average of 3.0 (on a 4.0 scale) in both the baccalaureate major area (EE or CpE) and overall. Applicants with a GPA below a 3.0 may be considered for provisional admission, which may require additional prerequisite courses in addition to the graduate degree requirements. The applications are submitted through the Office of Admissions of Old Dominion University. Together with the completed application form, two letters of recommendation from former undergraduate instructors, transcripts from all colleges and universities attended, GRE scores, a resume, and a personal statement of objectives are required. TOEFL scores are also required for international applicants. Applicants with academic degrees in areas other than electrical and computer engineering will be considered. Those with degrees in math, physics, computer science, or other engineering fields are encouraged to apply. The accelerated Bachelor's/Master's degree program in the Frank Batten College of Engineering and Technology at Old Dominion University is designed to provide an opportunity for exceptionally qualified engineering undergraduate students to obtain both a bachelors and a master's degree in Electrical and Computer Engineering. Typically undergraduate students apply at the end of their junior year for admission to the accelerated programs.

Accepted students from disciplines other than EE or CpE are required to complete a number of leveling courses to meet prerequisites for graduate studies. All students are required to have one year of college chemistry and one year of calculus-based college physics in addition to Calculus III and Differential Equations courses. Students at Old Dominion University may complete the leveling requirement by earning a minor in electrical or computer engineering with a GPA of 3.0 or greater. Students that have not earned a minor need to meet with the graduate program director to prepare a course plan and determine which pre-requisite courses are needed. In general, three to four leveling courses are needed and they are chosen from the following lists.

List of Possible Courses to Meet the Leveling Requirement

ECE 202	Circuit Analysis II	3
ECE 241	Fundamentals of Computer Engineering	4
ECE 302	Linear System Analysis	3
ECE 303	Introduction to Electrical Power	3
ECE 304	Probability, Statistics, and Reliability	3
ECE 313	Electronic Circuits	4
ECE 323	Electromagnetics	3
ECE 332	Microelectronic Materials and Processes	3
ECE 340	Digital Circuits	4
ECE 341	Digital System Design	3
ECE 346	Microcontrollers	3
ECE 381	Introduction to Discrete-time Signal Processing	3

Students interested in taking computer engineering graduate courses may need to take additional leveling computer science courses as indicated below.

List of Possible Computer Science Courses to Meet the Leveling Requirements

CS 333	Programming and Problem Solving in C++	4
CS 350	Introduction to Software Engineering	3
CS 361	Advanced Data Structures and Algorithms	3
CS 381	Introduction to Discrete Structures	3

Master's Degree Requirements

Both M.S. and M.E. degrees require a minimum of 30 credit hours of graduate study. Full-time and part-time students may pursue these degrees through a combination of on-campus and distance learning courses. The distance learning courses are available synchronously at the higher education centers and can be broadcast to any computer with a high speed Internet connection. These distance learning courses can also accommodate asynchronous students.

The M.S. degree requires a minimum of 24 credit hours of courses (not including the Graduate Seminar), at least 1 credit hour of Graduate Seminar, and 6 credit hours of thesis along with the oral thesis defense examination.

The M.E. degree project option requires a minimum of 27 credit hours of courses (not including the Graduate Seminar) and 3 credit hours in a project that includes an oral defense examination.

The M.E. degree course option requires a minimum of 30 credit hours of courses (not including the Graduate Seminar) and a written comprehensive examination at the end of the course work. The examination is offered every fall and spring semesters, and the student needs to pass the examination in no more than two attempts. The second attempt, if necessary, should be taken at the next offered examination.

These degree programs are available to full-time and part-time students seeking to improve their professional skills in electrical and computer engineering. Students are required to complete at least one course that meets the department's mathematics requirement. The current list of courses that meet this requirement is given next.

ECE 601	Linear Systems	3
ECE 611	Numerical Methods in Engineering Analysis	3
ECE 623	Electromagnetism	3
ECE 651	Statistical Analysis and Simulation	3

The remaining courses are chosen to meet the student's career objectives. The graduate course descriptions are included in the graduate catalog and in the department's website. Additional graduate courses are offered through the Commonwealth Graduate Engineering Program and the Virginia Consortium for Engineering and Science. The selection of courses is made in

coordination with the students' research advisor and/or the graduate program director. To earn a master's degree, a student needs to take at least five courses at the 600 or higher level, and no more than three courses at the 500 level. Also, no more than three graduate courses can be taken in other departments. All funded students are required to enroll in ECE 731.

Doctor of Philosophy in Electrical and Computer Engineering

Doctor of Philosophy Admission Requirements

Applicants to a doctoral degree in electrical and computer engineering are expected to have completed a master's degree in electrical engineering and/or computer engineering or a closely related technical field with a minimum grade point average of 3.5 (on a 4.0 scale) in graduate course work. The applications are submitted through the Office of Admissions of Old Dominion University. Together with the completed application form, three letters of recommendation, transcripts from all colleges and universities attended, GRE scores, a resume, and a personal statement of objectives are required. TOEFL scores are required for international applicants. At least two of the recommendation letters should be submitted by faculty or work supervisor familiar with the applicant's graduate work. The Frank Batten College of Engineering and Technology at Old Dominion University has the Direct Bachelor-to-Ph.D. and Integrated Bachelor/Ph.D. programs that allow exceptionally well-qualified undergraduate students to apply for admission directly to a Ph.D. program. The programs are described in the college section of the catalog.

Description of the Doctoral Degree

The Department offers a strong doctoral program leading to a Ph.D. in Electrical and Computer Engineering. A very important component of the doctoral degree is the original research pursued by the student which culminates in a written dissertation, as well as an oral defense of this work. Doctoral students usually publish the result of their research in highly reputable nationally and internationally refereed journals. In addition, the students are expected to present their work at national and international conferences.

Doctor of Philosophy Degree Requirements

The Ph.D. degree in Electrical and Computer Engineering requires

- 24 credit hours of graduate-level courses beyond the master's degree (not including Graduate Seminar),
- 24 research credit hours,
- successful completion of a written diagnostic examination,
- successful completion of written and oral candidacy examinations,
- successful completion of a dissertation research proposal, and
- successful completion and public defense of a dissertation.

The eight graduate-level courses are chosen together with the research advisor, and approved by the graduate program director. At least 1 credit hour of Graduate Seminar (ECE 831) if required too. It is required that at least five of the courses be at the 800 level (not including ECE 831), and no more than three graduate courses can be taken in other departments. Additional course work or appropriate research background may be required to meet prerequisites for courses or in preparation for the diagnostic examination. All funded students are required to enroll in ECE 831. The graduate course descriptions are included in the catalog and on the department's website. Additional graduate courses are offered through the Commonwealth Graduate Engineering Program and the Virginia Consortium for Engineering and Science.

All Ph.D. students are required to take the department's Ph.D. Diagnostic Examination for the first time before the end of their second semester in the Ph.D. program. The examination is offered every fall and spring semesters, and the student needs to pass the examination in no more than two attempts. The second attempt, if necessary, should be taken at the next offered examination. The topics for the examination and samples of previous examinations are posted in the department's website. The examination rules are given on the first page of each examination.

It is required that the written and oral candidacy examinations be taken in the semester when a student is completing the graduate course work or during the following semester. Once a student has completed the course work, passed the candidacy examinations, and has gained approval for the research proposal, the student advances to candidacy. It is a university requirement that students who have advanced to candidacy be enrolled for at least one credit hour every fall, spring, and summer until graduation.

Department of Engineering Management and Systems Engineering

2201 Systems Research and Academic Building
757-683-4558

Adrian Gheorghe, Chair
M. Pilar Pazos-Lago, Graduate Program Director, Master's Programs
Andres Sousa-Poza, Graduate Program Director, Doctoral Programs

Degree Programs

The department offers the following graduate degrees:

- Master of Engineering Management
- Master of Science in Engineering Management
- Master of Engineering with a concentration in Systems Engineering
- Ph.D. in Engineering Management
- Doctor of Engineering in Engineering Management and Systems Engineering

Degree Description

The Department of Engineering Management and Systems Engineering at Old Dominion University is the recipient of the American Society of Engineering Management's 1995, 2000, 2002, 2004, 2005, 2007, and 2010 awards for Excellence in Leadership in Graduate Programs. The Master of Engineering Management (MEM) program at Old Dominion University is also one of the first three programs certified by the American Society for Engineering Management. The program was initially certified in 2003 and has been re-certified in 2007 and 2012.

The Department of Engineering Management and Systems Engineering provides its graduates with the necessary skills, knowledge, and abilities required to design and manage the technology-based, project-driven enterprise. Fundamentally, the engineering management discipline addresses the problems, design, and management of projects and complex operations. The programs are grounded in solid principles of systems science and systems engineering while exploiting the tools of management science and project management. The Department of Engineering Management and Systems Engineering emphasizes the concept of technological leadership. Technological leadership focuses on the development of a professional perspective that anticipates opportunities for competitive advantages technology can provide to an enterprise.

Core course work in the engineering management and systems engineering programs concentrate on developing the knowledge and skills required by graduates to provide the project and program leadership and management necessary for an organization to develop and apply technologies. Technological leadership's vision looks to the creation of new products, processes, and services which, in turn, will create new markets or enable domination of existing ones. Through design projects and exercises centered around complex system and technology, students are led through alternative ways of thinking and communicating.

The engineering management and systems engineering programs at Old Dominion University provide students opportunities in the classroom and involvement with industrial partners. This allows students to gain confidence and experience to effectively create, integrate, and apply technology in enterprise operations.

The following requirement is applicable for all Engineering Management and Systems Engineering degree programs (Master's and Doctoral): All

students admitted to Engineering Management and Systems Engineering programs must earn a grade of "C" or better in all courses required for the degree and in all Engineering Management prerequisite courses. A student may be removed from the program if he/she receives 2 (two) grades of "C" or lower.

Master's Admission Information

Master of Engineering Management/Master of Science in Engineering Management

Admission to graduate programs in Engineering Management is in accordance with the general requirements for graduate degrees as specified in the Admission section of this Catalog. Applicants must have an undergraduate degree from an ABET-accredited program in engineering or engineering technology or from an accredited program in applied science with a GPA of 3.00 (out of 4.00) or better. Students with an undergraduate GPA between 2.70 and 3.00 may be admitted provisionally based on their academic preparation and GRE scores. The Department requires university-level TOEFL scores for all international students when English is not their first language.

Master of Engineering—Systems Engineering

Admission to the graduate program in Systems Engineering is in accordance with the general requirements for graduate degrees as specified in this Catalog. Specific requirements for systems engineering include a bachelor's degree in science, engineering, mathematics, computer science, or other related field. Applicants with a bachelor's degree in a non-technical discipline with approved college-level calculus and five years experience are eligible for admission to the program. An undergraduate grade point average of 3.00 (out of 4.00) in both the major and overall is required. Students with a GPA between 2.70 and 3.00 may be admitted provisionally based upon their work record, academic preparation, and GRE scores. Students with a GPA below 2.70 must complete additional academic course work so their overall GPA is raised to the appropriate level for admission. A minimum TOEFL score of 550 is required for all international students when English is not their first language.

Master's Degree Requirements

Master of Engineering Management/Master of Science in Engineering Management

The M.E.M and M.S. programs are oriented toward the design and management of technical projects, complex operations, and technology-based organizations. The Master of Science (M.S.) program requires thesis research, and the student is expected to identify an advisor and work with him/her starting from the first semester. Courses are scheduled in the evenings and at off-campus sites, including the Peninsula Higher Education Center in Hampton and the Virginia Beach Higher Education Center. A complete M.E.M. program is available through Old Dominion University's TELETECHNET distance learning program and through the Commonwealth Graduate Engineering Program. Both systems transmit courses to educational, industrial, and government locations throughout Virginia.

The master's degree programs in the Department of Engineering Management and Systems Engineering are in accordance with the general requirements for master's degrees as specified in the Requirements for Graduate Degrees section of this Catalog. Specific requirements for the Master of Engineering Management and Master of Science in engineering management are as follows:

The Engineering Management and Systems Engineering Department requires 31 credit hours of course work (10 three-credit courses plus a one-credit capstone course) for the M.E.M. The M.S. degree requires 24 credit hours of course work and six credit hours of thesis research for a total of 30 credit hours.

M.E.M. Courses:

Prerequisite *

Core

15

ENMA 600	Cost Estimating and Financial Analysis	
ENMA 601	Analysis of Organizational Systems	
ENMA 603	Operations Research	
ENMA 604	Project Management	
ENMA 614	Quality Systems Design	
Select one of the following:		3
ENMA 640	Integrated Systems Engineering I	
ENMA 715	Systems Analysis	
ENMA 724	Risk Analysis	
Electives **		12
Capstone		1
ENMA 605	Program Capstone (required final semester)	
Total Hours		31

M.S. Courses:

Prerequisite *		
Core		18
ENMA 600	Cost Estimating and Financial Analysis	
ENMA 601	Analysis of Organizational Systems	
ENMA 603	Operations Research	
ENMA 604	Project Management	
ENMA 614	Quality Systems Design	
ENMA 715	Systems Analysis	
ENMA 721	Foundations of Research	
Electives *		6
Thesis Research ***		6
Total Hours		30

* All students must have mathematics course work through the level of integral calculus; matrix algebra or differential equations; and a course in calculus-based statistics (ENMA 420/ENMA 520 or equivalent).

** ENMA 711 or ENMA 721 may be an elective required by the thesis advisor. At least three-fifths (3/5) of course work must be at the 600 or 700 level for the M.E.M. and M.S. degrees. Students must select twelve credit hours of elective coursework for the M.E.M. and six credit hours of elective course work for the M.S. degree. The electives may be selected from the ENMA courses (and/or from courses in other departments with the approval of the Graduate Program Director). All electives must be at the graduate level.

*** M.S. students take six credits of thesis research, which must be spread over a minimum of two semesters.

Exceptions to these requirements must be approved by the Graduate Program Director.

Master of Engineering—Systems Engineering

The focus of this degree program is to provide students with in-depth, real-world practitioner expertise in engineering and the integration of complex systems for government and commercial clients. Students in the program are introduced to core competencies for systems engineering, complex systems, modeling, systems analysis, complex problem solving, and the engineering disciplines needed for successful delivery of system solutions.

The Master of Engineering degree program in systems engineering is in accordance with the general requirements for master's degrees as specified in this Catalog. Specific requirements for the Master in Engineering with a concentration in systems engineering include the following:

The Engineering Management and Systems Engineering Department requires 31 graduate credit hours of course work (10 courses plus a one-credit capstone course) for the M.E. with a concentration in systems engineering program.

Prerequisite/Corequisite *		
Core		18
ENMA 602	Systems Engineering Management	
ENMA 640	Integrated Systems Engineering I	
ENMA 641	Requirements Management, Verification and Validation	
ENMA 660	Systems Architecture and Modeling	
ENMA 715	Systems Analysis	
ENMA 771	Risk and Vulnerability Management of Complex Interdependent Systems	
Capstone **		1
ENMA 605 or ENMA 690	Program Capstone Preparation Seminar for Systems Engineering Certification	
Electives ***		12
Select four of the following:		
ENMA 702	Methods for Rational Decision Making	
ENMA 703	Optimization Methods	
ENMA 710	Modeling and Analysis of Systems	
ENMA 712	Multi-Criteria Decision Analysis and Decision Support Systems	
ENMA 716	Complex Adaptive Situations Environment	
ENMA 717	Cost Engineering	
ENMA 723	Enterprise and Complex System Dynamics	
ENMA 750	System of Systems Engineering	
ENMA 751	Complexity, Engineering and Management	
ENMA 763	Robust Engineering Design	
Total Hours		31

* All students must have mathematics course work through the level of integral calculus, matrix algebra or differential equations, and ENMA 520 or equivalent calculus-based probability and statistics. Students who have not had a calculus-based probability and statistics course will be required to include ENMA 520, or equivalent, as part of their plan of study.

** Required for the Master of Engineering in systems engineering, is to be taken near the final semester of study.

*** Or others approved by the Graduate Program Director.

**** All students are expected to communicate effectively both orally and in written documents, that are correct in grammar, style, and mechanics. Those deemed insufficient may be required to take remedial speech or writing courses.

Doctor of Philosophy in Engineering Management

The Doctor of Philosophy (Ph.D.) focuses on developing the necessary skills to perform and evaluate rigorous research in areas related to the design and management of projects, programs, and complex human-technological systems. The goal of the Ph.D. program is to prepare graduates for careers in teaching and research at academic institutions as well as in other public and private organizations characterized by innovation and technological leadership.

Ph.D. Admission Requirements

Admission to graduate programs in engineering management and systems engineering is in accordance with the general requirements for graduate degrees as specified in the Graduate Admission section of this catalog. Specific requirements for the Department of Engineering Management and Systems Engineering include the following: applicants for the Ph.D. must have a bachelor's or master's degree from an accredited institution in engineering, engineering technology, applied science or applied mathematics, and at least 24 semester hours of graduate study approved by the graduate program director. An undergraduate GPA of at least 3.00

and a graduate GPA of at least 3.50 (on a 4.00 basis) and GRE general aptitude scores are required. Students lacking adequate academic preparation may be required to complete coursework in addition to the graduate admission requirements. A minimum TOEFL score of 550 is required for all international students when English is not their first language. As part of the admission process, all applicants will go through an interview process. The applicant will be contacted by the Graduate Program Director once the application and credentials are received to initiate the interview process. Students must also secure a faculty advisor prior to admission.

Ph.D. Degree Requirements

Curriculum requirements in engineering management are in accordance with the general requirements for Ph.D. degrees as specified in the Requirements for Graduate Degrees section of this catalog.

Requirements in preparing for the Ph.D. program in engineering management include:

1. Satisfactory completion of 51 credit hours of postmaster's degree credit or equivalent level of performance course work, including 24 credit hours of dissertation credit, and a minimum of 27 credit hours of course work.
2. Passing a written and oral candidacy examination at the end of the program of study course work.
3. The successful defense of a written dissertation proposal before the completion of nine hours of dissertation research.
4. The completion of a dissertation representing independent original research worthy of publication in a refereed scholarly journal.
5. The successful public defense of the dissertation before an audience which includes an appropriately selected committee of faculty knowledgeable in the field of the project.

Master's-Level Courses: As part of master's-level course work, all students must have completed the following engineering management leveling courses or their equivalent: ENMA 600, ENMA 603, and ENMA 604. Students may be admitted to the Ph.D. program deficient in these leveling courses, but as part of their plan of study, the student must take and successfully complete these courses at the earliest possible opportunity.

Plan of Study: The Ph.D. program is governed by a Plan of Study that is established by the student in conjunction with his/her advisor and guidance committee within the first nine credit hours of course work and will follow the established course requirements (below) unless a substitution to one or more courses is agreed upon between the advisor and student and approved by the Graduate Program Director.

Prerequisite *

Master's-Level **		
Plan of Study ***		
Core ****		15
ENMA 711	Methodology for Advanced Engineering Projects (required)	
ENMA 821	Foundations of Research (required)	
Select one from the each of the following methods		
Empirical Methods +		
ENMA 863	Robust Engineering Design	
Equivalent Course (with GPD authorization)		
Analytic Methods ++		
ENMA 803	Optimization Methods	
ENMA 823	Enterprise and Complex System Dynamics	
ENMA 810	Modeling and Analysis of Systems	
ENMA 802	Methods for Rational Decision Making	
Social Research Methods +++		
ENMA 815	Systems Analysis	
ENMA 816	Complex Adaptive Situations Environment	
Equivalent course (with GPD authorization)		

Electives #	12
Dissertation Research ##	24
Exams ###	
Total Hours	51

- * All students must have mathematics course work through the level of integral calculus matrix algebra or differential equations and a course in statistics (ENMA 420/ENMA 520 or equivalent).
- ** As part of master's-level course work, all students must have completed the following engineering management leveling courses or their equivalent: ENMA 600, ENMA 603, and ENMA 604. Students may be admitted to the Ph.D. program deficient in these leveling courses, but as part of their plan of study, the student must take and successfully complete these courses at the earliest possible opportunity.
- *** The Ph.D. program is governed by a Plan of Study that is established by the student in conjunction with his/her advisor and guidance committee within the first nine credit hours of course work and will follow the established course requirements (below) unless a substitution to one or more courses is agreed upon between the advisor and student and approved by the Graduate Program Director.
- **** At least three-fifths (3/5) of course work must be at the 800 level for the Ph.D. and D.Eng. degrees.
- + Statistical techniques and research approaches. The course should cover statistical techniques up to (at least) multivariate statistics covering techniques such as multivariate regression analysis, principal component factor analysis, cluster analysis, and canonical correlation analysis. If possible an introduction to structural equation modeling and non-parametric statistical analysis should be included.
- ++ Mathematical and other quantitative analytic techniques including modeling, analysis, and simulation approaches, and how they are applied within research. Methods such as system dynamics, agent based modeling, formal logic, and optimization methods should be addressed.
- +++ Approaches common in the social sciences and humanities. Methods may include grounded theory (as used in social sciences), coding techniques, social (quasi-) experimentation, and fuzzy logic. Diverse data collection methods should be addressed including focus groups, interviews, surveys and questionnaires.
- # Engineering Management courses or courses from other departments in the Colleges of Engineering and Technology, Sciences, and Business and Public Administration. All electives must be at the graduate level and must be approved by the Ph.D. Guidance Committee and Graduate Program Director as part of the student's plan of study.
- ## Minimum of 24 credit hours
- ### A candidacy exam, dissertation proposal defense, and a public dissertation defense are required after completing all course work.

Doctor of Engineering

The Department offers a Doctor of Engineering (D.Eng.) program with concentration in Engineering Management and Systems Engineering in accordance with the D.Eng. program requirements specified for the Batten College of Engineering and Technology in this catalog. Additional information on the admission procedure and criteria can be found at <http://eng.odu.edu/enma/academics/dengapply.shtml>.

Certificate Programs

Advanced Engineering Certificate

The Advanced Engineering Certificate Program consists of 12 credit hours of graduate level course work. The four courses comprising the certificate program are offered on a regular schedule to enable the completion of the program in two years. The program provides the opportunity for practicing

engineers to further their knowledge and become more competent in their profession.

Program Requirements

Admission to the program requires a Bachelor of Science degree in engineering (or equivalent). The certificate consists of four pre-approved graduate level courses contributing to an emphasis area that can be interdisciplinary. A grade point average of 3.0 or better is required to earn the certificate. Please refer to Frank Batten College of Engineering and Technology (<http://catalog.odu.edu/graduate/frankbattencollegeofengineeringandtechnology>) for more information.

Department of Mechanical and Aerospace Engineering

238 Kaufman Hall
757-683-6363

Sebastian Bawab, Chair
Colin Britcher, Associate Chair

Han Bao, Graduate Program Director

Degree Programs:

The department offers the following graduate degrees:

- Master of Science in Mechanical Engineering
- Master of Science in Aerospace Engineering
- Master of Engineering in Mechanical Engineering
- Master of Engineering in Aerospace Engineering
- Ph.D. in Mechanical Engineering
- Ph.D. in Aerospace Engineering
- Doctor of Engineering in Mechanical Engineering
- Doctor of Engineering in Aerospace Engineering

Degree Descriptions

The Department of Mechanical and Aerospace Engineering strives to provide the highest quality engineering education at the undergraduate and graduate levels, to engage in scholarly research at the forefront of mechanical and aerospace engineering, and to serve the professions of mechanical and aerospace engineering. Graduate degrees in mechanical engineering and aerospace engineering include the Master of Engineering, Master of Science, Doctor of Philosophy, and Doctor of Engineering degrees and are designed to prepare graduates for professional practice in teaching, research and development, design, and consulting. Graduates are prepared for challenging and rewarding employment in high-technology industries, research organizations, consulting firms and government agencies. These programs are also designed to serve both full-time and part-time graduate students. The department is closely associated with area industries, consulting firms, government agencies and research laboratories, which add relevance to the graduate engineering curricula, creating a stimulating environment for the pursuit of graduate studies. The students also benefit from the University's affiliation with NASA Langley Research Center, the Jefferson National Laboratory, the National Institute of Aerospace, and the Virginia Modeling Analysis and Simulation Center. All degree programs offered by the department can be utilized as components within the accelerated Baccalaureate-Master's and Baccalaureate-Doctoral degree programs offered through the Batten College of Engineering and Technology. For additional information about the educational and research opportunities available please visit our website at eng.odu.edu/mae.

Master's Admission Information

To qualify as a candidate for a Master of Science or a Master of Engineering program, applicants must meet the general University admission requirements and have completed undergraduate-level coursework that includes subject matter equivalent to a bachelor's degree in mechanical engineering, aerospace engineering, engineering mechanics, or a closely related discipline such as physics or mathematics. An applicant with an

overall grade point average (GPA) of 3.0 and a GPA in the major of 3.0 (4.0 scale) is eligible for regular admission. Applicants with a GPA below 3.0 may be eligible for provisional admission. Students are typically required to submit their Graduate Record Examination (GRE) scores, although the Graduate Program Director (GPD) may waive the GRE requirement for applicants with excellent academic credentials. For those applicants with non-engineering degrees, or with engineering degrees other than mechanical engineering, aerospace engineering, or engineering mechanics, successful completion of remedial graduate coursework may be required as a condition of admission. The Master of Science programs requires a minimum of 24 semester credit hours of coursework beyond the bachelor's degree with at least a B (3.0) average and a minimum of 6 semester credit hours of thesis research. The Master of Engineering program requires a minimum of 30 semester credit hours of course work with at least a B (3.0) average.

Master's Program Requirements

Students pursuing traditional Mechanical or Aerospace programs are required to take:

Core Courses:

MAE 601	Engineering Mathematics	3
or MAE 608	Applied Mathematics for Engineers	
or MATH 691	Engineering Analysis I	
Select three from the following:		9
MAE 602	Fluid Dynamics and Aerodynamics	3
MAE 603	Advanced Mechanics of Solids	3
MAE 604	Analytical Dynamics	3
MAE 605	Advanced Classical Thermodynamics	3
MAE 607	Continuum Mechanics	3
MAE 620	Heat Transfer I	3
MAE 640	Modern Control Theory	3
MAE 672	Design of Experiments	3
MAE 682	Concurrent Engineering	3
Total credit hours		12

In all programs, a maximum of 6 semester credit hours may be derived from 500-level courses.

Master of Science (Thesis) Programs

The Master of Science degree is a research degree requiring a written thesis. The thesis constitutes 6 semester credit hours within the 30 semester credit hour requirement. Students are given a verbal examination, administered as the student's thesis defense, under the direction of the faculty advisor with support from the Thesis Advisory Committee. The examination consists of two parts, a student presentation of their thesis research followed by a closed session where the Thesis Advisory Committee further questions the student. The committee concentrates on research presented in both oral and written formats, but may expand questioning to include related course work. The thesis should be formatted with guidelines established by the College.

Master of Engineering (Non-Thesis) Programs

The Master of Engineering is a non-research degree. The 30 semester credit hours is thus met entirely by course work. During their final semester, students are required to either pass a comprehensive examination covering their course work or successfully complete a 3 hour project course, which includes written and oral presentations. The master's comprehensive examination is administered by the Graduate Program Director, and the rules for the comprehensive exam are identical to the Preliminary Diagnostic Examination for the Ph.D. program.

Doctor of Philosophy Programs

The Doctor of Philosophy programs in Mechanical or Aerospace Engineering are advanced research degrees requiring a written dissertation offering new and unique contributions of a fundamental nature. Graduates

are prepared for leadership roles in the many facets of engineering including teaching, research and development, design, and consulting. Doctoral students may select specializations in such technical areas as:

- aerodynamics and fluids
- thermodynamics and energy
- dynamics and controls
- materials and structures
- design and manufacturing

Students are also encouraged to select complementary courses in other engineering or science disciplines. The University's close associations with area industries, consulting firms, government agencies, and research laboratories create a stimulating environment for the pursuit of graduate studies.

Doctor of Philosophy Admission Requirements

To qualify for admission to a Doctor of Philosophy degree in Mechanical or Aerospace Engineering, a student must have earned a master's degree from an accredited institution of higher learning in engineering, physics, or mathematics, including graduate-level course work equivalent to the corresponding master's programs in Mechanical and Aerospace Engineering. Applicants with an overall grade point average (GPA) of 3.5 on a 4.0 scale at the master's level are eligible for regular admission. Applicants with a GPA below 3.5 who present evidence and potential for improvement may be eligible for provisional admission. Students are typically required to submit their Graduate Record Examination (GRE) scores, although the Graduate Program Director (GPD) may waive the GRE requirement for applicants with excellent academic credentials.

Doctor of Philosophy Degree Requirements

A minimum of 24 credit hours of course work beyond the master's degree and a minimum of 24 semester credit hours of dissertation research must be included in the doctoral degree program. At least 60% of the course work for the doctoral degree should be at the 800-level and the student should maintain at least a B (3.0) average. All doctoral students should satisfy either a foreign language or research skill requirement.

Preliminary Diagnostic Examination

Ph.D. students must take the diagnostic exam no later than the end of their first academic year. Diagnostic exams are scheduled annually in October and February and the exam dates are announced by the Graduate Program Director (GPD). Students who received their Master of Science degrees from ODU with a GPA of 3.5 or above are exempt from the diagnostic exam.

Students must fill the Ph.D. Diagnostic Exam form to notify the GPD of their desire to take the diagnostic exam. The form must be approved by the student's advisor. The diagnostic exam is a three hour long written exam containing four equally weighted questions from the core courses. It is conducted without any reference books or notes. Use of electronic devices with internet connection is not permitted. Only non-programmable scientific calculators are allowed. The questions might contain useful formulae to guide the students. Diagnostic exam questions will be prepared and graded by the faculty who taught these courses in the past five years. Students must pass each core topic area with a minimum passing grade of B. Students who pass at least two of the four subject areas in their first attempt can take the exam for a second time, where they will be tested on the failed areas. Students who fail their diagnostic exam can consider pursuing other MAE degrees. Students who fail their first attempt do not receive priority for departmental support as graduate teaching assistants or graders until they pass their diagnostic exam. However support as a graduate research assistant is within the discretion of the student's advisor. Part time or special status students attending ODU for joint foreign-institution/ODU degrees must also take their diagnostic exam within the first year of their Ph.D. studies at ODU.

Candidacy Examination

The candidacy exam is taken once the students finish their course work. The exam consists of written and oral parts. Written part of the exam can consist of a critical review report on a subject area determined by the

student's advising committee. Written candidacy exam will be reviewed by the student's committee members for its technical content as well as for evaluation of the student's writing proficiency and research skills. Oral part of the candidacy exam is based on the defense of the written part, and will include extensive examination of the student's fundamental knowledge in his/her research area.

Dissertation Proposal

After the student passes the written and oral candidacy examinations, for advancement to candidacy, he/she must pass the dissertation proposal stage, which is an oral presentation of the student's work containing literature survey and preliminary results sections to demonstrate feasibility of the proposed work.

Dissertation

Ph.D. candidates are expected to work with their dissertation advisors to form their Dissertation Committees. A Dissertation Committee should be composed of individuals with significant knowledge related to the candidate's dissertation research. The majority of whom must be full-time faculty members of the department.

Ph.D. candidates must submit their written dissertation to the committee members at least two weeks prior to the dissertation defense. The dissertation should be formatted in accordance with guidelines established by the college.

The dissertation defense consists of two parts; an open presentation to the general public and a closed examination conducted by the dissertation committee. The dissertation must be approved by the majority of the dissertation committee and must constitute a significant original contribution to the field. Students are permitted only two attempts to successfully complete the dissertation defense.

Doctor of Engineering

The Department offers a Doctor of Engineering (D.Eng.) program with concentrations in Mechanical Engineering or Aerospace Engineering in accordance with the D.Eng. program criteria and requirements specified for the Batten College of Engineering and Technology in this catalog.

The Department's graduate course portfolio is listed below:

Core Graduate Courses

MAE 601	Engineering Mathematics	3
MAE 602	Fluid Dynamics and Aerodynamics	3
MAE 603	Advanced Mechanics of Solids	3
MAE 604	Analytical Dynamics	3
MAE 605	Advanced Classical Thermodynamics	3
MAE 607	Continuum Mechanics	3
MAE 620	Heat Transfer I	3
MAE 640	Modern Control Theory	3
MAE 672	Design of Experiments	3
MAE 682	Concurrent Engineering	3

Aerodynamics and Fluids Graduate Courses

MAE 503	Flight Mechanics	3
MAE 506	Flight Vehicle Aerodynamics	3
MAE 507	Ground Vehicle Aerodynamics	3
MAE 517	Propulsion Systems	3
MAE 557	Motorsports Vehicle Dynamics	3
MAE 560	Introduction to Space Systems Engineering	3
MAE 567	Racecar Performance	3
MAE 606	Real-Time Signals and Systems	3
MAE 610	Supersonic Flow	3
MAE 611	Computational Fluid Dynamics I	3
MAE 612	Experimental Aerodynamics	3
MAE 613	Aerospace Test Facilities	3

MAE 711/811	Hypersonic Aerodynamics	3
MAE 713/813	Turbulent Flow	3
MAE 714/814	Aerodynamic Flow Control	3
MAE 715/815	Boundary Layer Theory	3
MAE 772/872	Response Surface Methodology	3

Thermodynamics and Energy Graduate Courses

MAE 511	Mechanical Engineering Power Systems Theory and Design	3
MAE 512	Environmental Control	3
MAE 513	Energy Conversion	3
MAE 514	Introduction to Gas Dynamics	3
MAE 622	Theory and Design of Turbomachines	3
MAE 623	Nuclear Engineering	3
MAE 624	Energy Utilization and Conservation	3
MAE 720/820	Heat Transfer II	3
MAE 721/821	Fundamentals of Combustion	3

Materials and Structures Graduate Courses

MAE 522	Modern Engineering Materials	3
MAE 630	Finite Element Analysis I	3
MAE 631	Experimental Structural Dynamics	3
MAE 634	Theory of Vibrations	3
MAE 650	Composite Materials	3
MAE 652	Mechanical Behavior of Materials	3
MAE 730/830	Finite Element Analysis II	3
MAE 731/831	Mechanics of Composite Structures	3
MAE 733/833	Nonlinear Aerospace Structures	3
MAE 734/834	Structural Vibrations II	3
MAE 750/850	Nanoscale Mechanical and Structural Properties of Materials	3
MAE 751/851	Fatigue and Fracture	3

Dynamics and Controls Graduate Courses

MAE 504	Vibrations	3
MAE 531	Mechanisms Analysis and Design	3
MAE 538	Applied Analog and Digital Control	3
MAE 641	Aerospace Vehicle Performance	3
MAE 740/840	Autonomous and Robotic Systems Analysis and Control	3
MAE 741/841	Optimal Control Theory	3
MAE 742/842	Multibody Dynamics: Theories and Applications	3
MAE 743/843	Kinematic Synthesis of Mechanisms	3
MAE 744/844	Atmospheric Flight Dynamics and Control	3
MAE 745/845	Space Flight Dynamics and Control	3
MAE 746/846	Advanced Control Methodologies	3

Materials and Structures Graduate Courses

MAE 522	Modern Engineering Materials	3
MAE 630	Finite Element Analysis I	3
MAE 631	Experimental Structural Dynamics	3
MAE 634	Theory of Vibrations	3
MAE 650	Composite Materials	3
MAE 652	Mechanical Behavior of Materials	3
MAE 654	Thermomechanical Processing of Materials	3
MAE 730/830	Finite Element Analysis II	3
MAE 731/831	Mechanics of Composite Structures	3
MAE 734/834	Structural Vibrations II	3

MAE 750/850	Nanoscale Mechanical and Structural Properties of Materials	3
MAE 751/851	Fatigue and Fracture	3

Design/Manufacturing Graduate Courses

MAE 680	Engineering Software for Computer-Aided Analysis and Design	3
MAE 681	Robots and Manufacturing Automation	3
MAE 686	Engineering Design with Uncertainties	3
MAE 688	Computational Intelligence for Engineering Design Optimization Problems	3
MAE 780/880	Engineering Optimization	3
MAE 781/881	Advanced Design	3
MAE 785/885	Advanced Manufacturing Technology	3
MAE 787/887	Life Cycle Engineering	3

Naval Architecture and Marine Engineering Certificate

In order to provide the opportunity for practicing engineers to further their knowledge and to become more competent in the fields of Naval Architecture and Marine Engineering, the Department of Mechanical and Aerospace Engineering offers a non-degree graduate level certificate program in Naval Architecture and Marine Engineering. Admission to the program requires a Bachelor of Science degree (or equivalent) in Mechanical Engineering, Aerospace Engineering, Naval Architecture and Marine Engineering, or a related field. The students must complete four 3-credit graduate-level courses to earn a certificate. The certificate program credits will be transferable to the Master's degree programs in Mechanical and Aerospace Engineering. The certificate program offers two tracks:

1. Naval Architecture
2. Marine Engineering

To meet the requirements of either track, students must complete a common required course, Engineering Mathematics or MAE 608, Applied Mathematics for Engineers and three 3-credit courses described below.

Naval Architecture Track:

Required

MAE 450/550	Principles of Naval Architecture	3
Select two from the following:		6

MAE 688	Computational Intelligence for Engineering Design Optimization Problems	
MAE 695	Topics in Mechanical and Aerospace Engineering (Numerical Marine Hydrodynamics)	
MAE 695	Topics in Mechanical and Aerospace Engineering (Ship Resistance and Propulsion)	
MAE 695	Topics in Mechanical and Aerospace Engineering (Ship Production and Maintenance)	
MAE 695	Topics in Mechanical and Aerospace Engineering (Dynamics of Marine Crafts)	
MAE 695	Topics in Mechanical and Aerospace Engineering (Marine Structures)	

Marine Engineering Track:

Required

MAE 511	Mechanical Engineering Power Systems Theory and Design	3
Select two from the following:		6

MAE 512	Environmental Control	
MAE 517	Propulsion Systems	

Department of Modeling, Simulation and Visualization Engineering

1300 Engineering and Computational Sciences Building
757-683-3720

www.eng.odu.edu/msve

Frederic (Rick) D. McKenzie, Chair
Yuzhong Shen, Graduate Program Director

Degree Programs:

The department offers the following graduate degrees:

- Ph.D. in Modeling and Simulation
- Doctor of Engineering in Modeling and Simulation
- Master of Science in Modeling and Simulation
- Master of Engineering in Modeling and Simulation
- Graduate Certificate in Modeling and Simulation Engineering

Description of Master's Degree

The master's degree in modeling and simulation (M&S) emphasizes a strong, common subject core while providing the student with the flexibility to design a plan of study to meet each individual's study objectives and needs. The purpose of the program's subject core is to provide a common academic foundation for all simulation students. Thus, all students in this program will have grounding in the same methods, principles, and philosophy of simulation. This provides the mechanisms for the simulationist to work across disciplines and domains while maintaining a common frame of reference for communication, technical specialization, and advanced study and research. The master's degree is available as a thesis option (MS) or non-thesis option (ME); both require 30 hours of graduate credit. The Master of Science (MS) in Modeling and Simulation requires six hours of thesis credit and 24 hours of course credit. The Master of Engineering (ME) in Modeling and Simulation requires 30 hours of course credit. The MS program is directed primarily at full-time students who are preparing for a career in advanced M&S research and/or academic positions, while the ME program is focused on developing the practical skills and knowledge needed to solve problems requiring applications of modeling and simulation.

The program's subject core consists of:

1. an overview of modeling and simulation;
2. an in-depth exploration of specific simulation methodological approaches;
3. simulation system modeling principles and techniques;
4. an introduction to computer visualization and visual simulation; and,
5. principles of stochastic analysis.

Most courses are offered in distance learning format. They are delivered to Old Dominion University's higher education centers and are available synchronously using video conferencing software. Additionally, the MSVE department is offering a Master of Engineering Online program.

A significant resource to the program is the Virginia Modeling, Analysis and Simulation Center (VMASC). The primary purposes of VMASC include the advancement of state-of-the-art modeling and simulation through research and development and the transfer of modeling and simulation technology to industry, education, and government. Constituent interest in this center is shared by numerous industrial partners as well as local Department of Defense organizations.

Master's Admission Requirements

The Master's Degree in Modeling and Simulation is designed for students having bachelor's degrees in Engineering, Science or Mathematics, although students from other educational backgrounds may apply with appropriate leveling courses. Prerequisites for admission include: mathematics – two courses in differential and integral calculus and one course in calculus-based probability and statistics; and computer science – algorithmic problem solving using a high-level object-oriented programming language such as C++.

A minimum GPA of 2.80 overall and a minimum GPA of 3.0 in the undergraduate major are required. Students with notable deficiencies may be considered for provisional admission and will be required to complete prerequisite course requirements in addition to the graduate degree requirements. Job experience and training may be considered in evaluating prerequisite requirements.

Applicants should plan to submit a completed application form, transcripts from all colleges and universities attended, GRE scores (verbal, quantitative, and analytical writing), a resume and personal statement of objectives, two letters of recommendation from former university instructors, and TOEFL scores if an international applicant.

Potential prerequisite courses for the master's degrees in modeling and simulation include the following:

1. Introductory differential and integral calculus equivalent to MATH 211 (Calculus I) and MATH 212 (Calculus II).
2. Calculus-based probability and statistics; this material is available for graduate credit in ENMA 520, PSYC 727, or PSYC 728.
3. Computer science fundamentals including an object-oriented programming language such as C++, algorithmic problem solving, and data structures.

Master of Science Degree Requirements

The Master of Science program requires 12 hours of course credit in modeling and simulation foundation courses. These foundation courses include:

MSIM 741	Principles of Visualization	3
MSIM 551	Analysis for Modeling and Simulation	3
or MSIM 751	Advanced Analysis for Modeling and Simulation	
	Advanced Modeling Course (see list below)	3
	Advanced Simulation Course (see list below)	3

Advanced Modeling Course Examples (3 credits)

MSIM 607	Machine Learning I
MSIM 660	System Architecture and Modeling
MSIM 702	Methods of Rational Decision Making
MSIM 730	Simulation Formalisms
MSIM 772	Modeling Global Events
MSIM 774	Transportation Network Flow Models
	Other courses with graduate program director's approval.

Advanced Simulation Course Examples (3 credits)

MSIM 711	Finite Element Analysis
MSIM 722	Cluster Parallel Computing
MSIM 725	Principles of Combat Modeling and Simulation
MSIM 742	Synthetic Environments
MSIM 776	Simulation Modeling in Transportation Networks
	Other courses with graduate program director's approval.

The remaining course credits (12 credits) are elective course credits. These courses are selected to achieve one or more program objectives or themes and must be approved by the student's advisor and/or graduate program

director. Elective courses outside the MSVE Department must be approved by the graduate program director. The program concludes with 6 credit hours of thesis credit (MSIM 699) and a thesis defense.

Certain students will need to take pre-requisite leveling courses that will count towards the 12 credit hour elective course requirement. These courses are: MSIM 510 Model Engineering; MSIM 541 Computer Graphics and Visualization; MSIM 602 Simulation Fundamentals; and, MSIM 603 Simulation Design.

Master of Engineering Degree Requirements

The Master of Engineering program requires completion of 10 three-credit courses; four core courses and six elective courses are required to complete the degree program.

MSIM 741	Principles of Visualization	3
MSIM 551	Analysis for Modeling and Simulation	3
or MSIM 751	Advanced Analysis for Modeling and Simulation	
Advanced Modeling Course (see list below)		3
Advanced Simulation Course (see list below)		3

Advanced Modeling Course Examples (3 credits)

MSIM 607	Machine Learning I
MSIM 660	System Architecture and Modeling
MSIM 702	Methods of Rational Decision Making
MSIM 730	Simulation Formalisms
MSIM 772	Modeling Global Events
MSIM 774	Transportation Network Flow Models
Other courses with graduate program director's approval.	

Advanced Simulation Course Examples (3 credits)

MSIM 711	Finite Element Analysis
MSIM 722	Cluster Parallel Computing
MSIM 725	Principles of Combat Modeling and Simulation
MSIM 742	Synthetic Environments
MSIM 776	Simulation Modeling in Transportation Networks
Other courses with graduate program director's approval.	

Students must take six electives, 3 credit hours each, in addition to the core courses. Several electives are available covering topics such as system dynamics, social networks, graduate level statistics, and combat modeling. Other courses must be approved by the graduate program director.

Certain students will need to take pre-requisite leveling courses that will count towards the six elective course requirement. These courses are: MSIM 510 Model Engineering; MSIM 541 Computer Graphics and Visualization; MSIM 602 Simulation Fundamentals; and, MSIM 603 Simulation Design.

Master of Engineering Online Program

The MSVE department also offers an ME online degree in Modeling and Simulation via the Blackboard Academic Suite that provides online lectures, homework submissions, examinations, discussion boards, wikis, video/audio collaboration sessions and grading. Students having access to reliable high speed internet service can connect and participate in engaging discussion and distributed asynchronous learning with the instructor and other students. All course materials are distributed and collected electronically. Students located in the Hampton Roads region may utilize live courses to fulfill the elective course requirement with approval from the MSVE graduate program director.

Master of Engineering Online Admission Requirements

Most students in this program would have limited or no knowledge of modeling and simulation before starting the program. Their objective

would be to develop knowledge and credentials needed for employment or advancement in a modeling and simulation company or organization. The Master of Engineering degree program offers courses that develop the practical skills and knowledge needed to solve problems requiring the application of modeling and simulation. Applicants are expected to have earned a bachelor's degree and have successfully taken previous courses in calculus and statistics, and programming skills in C++.

The GPA in the student's undergraduate major, student's performance in prerequisite courses, and GRE scores (verbal, quantitative, and analytical) are used to determine eligibility for admission into the program. Job experience and training may also be considered in evaluating prerequisite requirements.

Description of Doctor of Philosophy Degree

The Ph.D. in Modeling and Simulation program focuses on developing the necessary skills and knowledge to enable the graduate to conduct and evaluate independent, original research in an area of modeling and simulation. The goal of the program is to prepare students for careers in teaching and research at academic institutions, as well as the conduct or leadership of research and development in public and private organizations.

Doctor of Philosophy Admission Requirements

Admission to the Ph.D. in M&S program is made in accordance with Old Dominion University and Batten College of Engineering and Technology requirements for doctoral programs as specified in this Catalog. Specific requirements for the modeling and simulation degree include the following:

1. Completion of a master's degree in an appropriate and closely related field is expected. However, students who have completed 24 credits of graduate courses in an appropriate field from an accredited institution may apply.
2. A minimum GPA in graduate course work of 3.50 (out of 4.0) is required of most students. A student with a GPA greater than 3.25 and with evidence of a high level of professional capability in the field of modeling and simulation may be eligible for admission to the program upon submission of a petition to the graduate program director.
3. Recent scores (typically, not more than five years old) on the Graduate Record Examination's (GRE) verbal, quantitative, and analytical writing sections must be submitted by all applicants.
4. Three letters of recommendation (typically at least two of which are from faculty in the highest degree program completed when the application is within five years of graduation from that degree program) are required.
5. The applicant must submit a statement of purpose, goals, and objectives related to the program and a resume.

Applicants are expected to have the following foundation knowledge:

1. Mathematics fundamentals including differential and integral calculus, ordinary differential equations, calculus-based probability and statistics, and linear algebra.
2. Computer science fundamentals including an object-oriented programming language such as C++, algorithmic problem solving, and data structures.
3. Knowledge of the content of the foundation courses required in the Modeling and Simulation Master's Program.

Doctor of Philosophy Degree Requirements

The Ph.D. in modeling and simulation is offered in accordance with the general requirements for doctoral degrees as specified in the Requirements for Graduate Degrees Section of this Catalog. Specific program of study requirements for the concentration in modeling and simulation include the following:

1. Completion of a minimum of 24 credits of course work beyond the master's degree; and a minimum of 24 credits of dissertation research.
2. Successful completion of a written diagnostic examination before completion of nine credits of advanced course work.

3. Successful completion of a written and oral qualifying (candidacy) examination near the completion of the course work.
4. Successful presentation of a dissertation research proposal at the beginning of the dissertation research.
5. The successful completion and public defense of a dissertation representing independent, original research worthy of publication in a peer-reviewed scholarly journal.

The program of study for the Ph.D. in M&S program is developed with the approval of the graduate program director and the student's advisor. The program shall include a minimum of 24 credit hours of course work beyond the master's degree distributed as follows.

Common Core

Advanced Simulation Course (see the list below)	3
MSIM 830 Simulation Formalisms	3
MSIM 842 Synthetic Environments	3
MSIM 851 Advanced Analysis for Modeling and Simulation	3
Total Hours	12

Advanced Simulation Course Examples (3 credits)

MSIM 811 Finite Element Analysis	
MSIM 822 Cluster Parallel Computing	
MSIM 825 Principles of Combat Modeling and Simulation	
MSIM 876 Simulation Modeling in Transportation Networks	

Other courses with graduate program director's approval.

Electives - Minimum of 12 credits of elective courses that provide a basis for dissertation research. No more than six credits from course work satisfying foundation knowledge requirements may be included in the program of study for elective credit. At least three-fifths (15 credits) of non-dissertation course work must be at the 800-level. Elective courses outside the MSVE Department must be approved by the graduate program director.

Certain students entering the program will be required to complete additional pre-requisite leveling courses. These courses are: MSIM 510 Model Engineering; MSIM 541 Computer Graphics and Visualization; MSIM 602 Simulation Fundamentals; and, MSIM 603 Simulation Design.

Description of Doctor of Engineering Degree

The D. Eng. in Modeling and Simulation program focuses on developing the advanced skills and knowledge to enable the graduate to conduct and lead advanced technical M&S projects in an engineering environment. It affords engineering practitioners the opportunity to achieve advanced graduate education beyond the master's degree.

Doctor of Engineering Admission Requirements

Admission to the D. Eng. Program with a concentration in modeling and simulation is made in accordance with Old Dominion University and Batten College of Engineering and Technology requirements for doctoral programs as specified in this catalog. Specific admission requirements are identical to the admission requirements for the Doctor of Philosophy program with a concentration in modeling and simulation.

Doctor of Engineering Degree Requirements

The D. Eng. in modeling and simulation is offered in accordance with the D. Eng. degree requirements as specified for the Batten College of Engineering and Technology in this catalog. Specific program of study requirements for the concentration in modeling and simulation include the following.

1. Completion of a minimum of 18 credits of core professional courses; a minimum of 18 credits of core and elective technical courses; and a minimum of 12 credits of applied doctoral project.
2. Successful completion of a written diagnostic examination before completion of nine credits of advanced course work.

3. Successful completion of a written and oral qualifying (candidacy) examination near the completion of the course work.
4. Successful presentation of a project concept proposal.
5. Successful presentation and public defense of the completed project. The project should be worthy of publication in a peer-reviewed scholarly journal.

The program of study for the D.Eng. in M&S program is developed with the approval of the graduate program director and the student's advisor. The program shall include a minimum of 18 credits of professional course work and 18 credits of technical core course work beyond the master's degree distributed as follows:

Professional Core Courses		18
ENMA 604	Project Management	
ENGN 611	Financial Engineering	
ENGN 612	Analysis of Organizational Systems	
ENGN 811	Methodologies for Advanced Engineering Projects	
ENGN 812	Engineering Leadership	
ENGN 813	Engineering Ethics	

Technical Core Courses		18
Advanced Simulation Course from the list below		
MSIM 830	Simulation Formalisms	
MSIM 842	Synthetic Environments	
MSIM 851	Advanced Analysis for Modeling and Simulation	
Two approved technical elective courses - 6 credits		
Total Hours		36

Advanced Simulation Course Examples (3 credits)

MSIM 811	Finite Element Analysis
MSIM 822	Cluster Parallel Computing
MSIM 825	Principles of Combat Modeling and Simulation
MSIM 876	Simulation Modeling in Transportation Networks

Other courses with graduate program director's approval.

No more than three credits from course work satisfying foundation knowledge requirements may be included in the program of study for technical elective credit. At least three-fifths of the non-project coursework must be at the 800-level.

Certain students entering the program will be required to complete additional pre-requisite leveling courses. These courses are: MSIM 510 Model Engineering; MSIM 541 Computer Graphics and Visualization; MSIM 602 Simulation Fundamentals; and, MSIM 603 Simulation Design.

Graduate Certificate in Modeling and Simulation Engineering

The Graduate Certificate in Modeling and Simulation Engineering is designed for those who meet the admission requirements of the modeling and simulation master's program and wish to broaden their knowledge of modeling and simulation related principles and practices without pursuing a graduate degree. This is a 12 credit hour non-degree program offered by the Department of Modeling Simulation and Visualization Engineering. The certificate program is open to both degree-seeking and non-degree-seeking graduate students. Certain courses taken for the certificate program may later be applied to the master's degree in modeling and simulation.

Graduate Certificate Admission Requirements

Students should have either an undergraduate degree from a regionally accredited institution and should have a mathematical background through calculus, along with a calculus based probability and statistics course. Students should submit a graduate non-degree application through the

Office of Admissions, and then submit a departmental application with copies of unofficial transcripts from all previous coursework to the MSVE Department. Departmental applications are available online on the MSVE Department's website – <http://eng.odu.edu/msve> - and should be sent to:

Academic Advisor and Program Manager
 MSVE Department
 Old Dominion University
 1300 Engineering and Computational Sciences Building
 Norfolk, VA 23529

Graduate Certificate Requirements

The Graduate Certificate in Modeling and Simulation Engineering requires the completion of 12 credit hours at the graduate level. The course requirements are:

MSIM 601	Introduction to Modeling and Simulation (required of all students)	3
MSIM 602	Simulation Fundamentals	3
One course from the following below:		3
MSIM 510	Model Engineering	
MSIM 541	Computer Graphics and Visualization	
MSIM 551	Analysis for Modeling and Simulation	
MSIM 603	Simulation Design	
MSIM ELE - MSIM Elective *		3
<hr/> Total Hours		12

* A graduate level elective approved by the graduate program director. This elective may be an MSIM course or from another discipline outside of modeling and simulation. It is possible that this course may be outside the discipline of modeling and simulation, but approved because it complements the field of M&S and the student's interests.

An overall GPA of 3.00 or better is required to earn the graduate certificate in modeling and simulation engineering.

College of Health Sciences

Shelley C. Mishoe, Dean
 Richardean Benjamin, Associate Dean
 Deborah B. Bauman, Assistant Dean

2114 Health Sciences Building
 Norfolk, VA 23529
 757-683-4960
 www.hs.odu.edu

Doctorate:

- Health Services Research (Ph.D.)
- Physical Therapy (D.P.T.)
- Doctor of Nursing Practice (D.N.P.)

Master's:

- Athletic Training (M.S.A.T.)
- Community Health (M.S.)
 - Emphasis area: Environmental Health
- Dental Hygiene (M.S.)
- Nursing (M.S.N.)
- Public Health (M.P.H.)
 - Tracts: Environmental Health & Health Promotion

Accelerated Programs:

- B.S. in Health Sciences to Master of Public Health
- B.S. in Dental Hygiene to M.S. in Dental Hygiene
- B.S. in Environmental Health to M.S. in Community Health
- B.S. in Environmental Health to Master of Public Health
- B.S. in Nursing to DNP – Nurse Executive
- B.S. in Nursing to DNP – FNP Program
- B.S. in Nursing to DNP – WHNP Program

Graduate Certificate Programs:

- Modeling and Simulation in Health Sciences
- Molecular Diagnostics
- Nurse Educator
- Nurse Executive
- Occupational Safety

College Mission

The college mission is to improve individual and community health by advanced professional education, influential research, and responsive service. The vision of the College of Health Sciences is to be an internationally recognized leader in advancing health care by educating competent practitioners, generating practically significant scientific knowledge and innovative technologies, fostering scholarly collaborations, and promoting positive public health policies.

The college consists of the School of Community and Environmental Health, the Gene W. Hirschfeld School of Dental Hygiene, the School of Medical Laboratory and Radiation Sciences, the School of Nursing, and the School of Physical Therapy and Athletic Training. These schools offer a variety of master's and doctoral degrees, and non-degree certificate programs, accelerated and degree completion programs, and professional continuing education programs. In addition, many of these programs are offered off-campus and in a variety of distance learning formats. The degree programs are competitive, fully accredited, and nationally recognized for their quality graduates.

Program Application, Acceptance, and Continuance

A separate application must be submitted to be considered for acceptance into the health sciences majors. Application information, qualifications, deadlines, and advisors are listed in the specific program sections of this catalog and on the web site.

Acceptance to the University does not constitute or guarantee acceptance into a health sciences major. Students are notified by the program director of their acceptance and any other program specific requirements such as physicals, immunizations, technical standards, etc. Continuance in the health sciences majors requires strong academic achievement, including successful demonstration of knowledge and use of practical and critical thinking skills in laboratory and in clinical rotations. Criminal background checks may be required as specified in course syllabi. Any student deemed unacceptable for clinical rotation due to results from a criminal background check will not be allowed to complete the program of study.

The College of Health Sciences has developed graduate programs in the health-related professions that prepare individuals for practice, teaching, research, or administration in health-care delivery to meet the needs of the region, the state, and the nation. These programs include Master of Science degrees in community health and dental hygiene, the Master of Science in Nursing degree, the Master of Public Health degree, the Doctor of Physical Therapy degree, the Doctor of Nursing Practice degree, and the Ph.D. in health services research.

Certificate in Global Health

<https://www.odu.edu/hs/centers/globalhealth>

Muge Akpınar-Elci, MD, MPH, Program Director

Global Health aims to show us the big picture. Mistakenly, people assume that the target of "Global Health" involves mainly tackling problems in the developing world. Diseases and health problems do not recognize borders. All countries can learn from the experiences of other countries. Neglecting to address health problems in a global scale may affect people's health, well-being and national security around the world including in developed countries such as the United States.

This competency-based certificate program aims to provide comprehensive training on Global Health. Additionally, this certification program embraces a multidisciplinary focus. The Global Health Certificate is designed as an online program for professionals who are practicing or who plan to practice in a worldwide setting. Graduates of the Global Health Certificate can expect to find employment in a variety of fields including health-related governmental/non-governmental organizations, university research programs, international healthcare consultancies, and multinational corporations (Education Advisory Board, 2013). The certificate requires three core courses (3 credit hours each), two electives (2 credit hours each) and a practicum or a research paper (2 credit hours) for a total fifteen (15) credits. A maximum of 6 credit hours from graduate level courses may be transferred. Admission to the certificate program requires a bachelor's degree (or the equivalent).

Required Core Courses		9
HLSC 746	Epidemiology	
HLSC 776	Global Health	
HLSC 702	Health Management	
Electives (Select two)		4
HLSC 778	Global Environmental Health	
HLSC 780	Monitoring & Evaluating Global Health Programs	
HLSC 782	One Health, One Medicine	
HLSC 784	Key Competencies for Co-creating Sustainable Futures	
HLSC 785	Issues and Opportunities in Global Health Research	
Research paper or Practicum (Select one)		2
HLSC 798	Supervised Research	
HLSC 768	Practicum in Global Health	

NOTE: A maximum of 6 credit hours from graduate level courses may be transferred.

Total Hours 15

PhD in Health Services Research

757-683-6953

www.hs.odu.edu/commhealth/academics/PhD/

Dr. Deanne Shuman, Program Director

The primary mission of the Ph.D. in health services research is to develop leaders and problem solvers whose professional services will improve the health of the population not only in Eastern Virginia but also statewide, nationally, and internationally. Health services researchers examine health care quality and effectiveness, patient outcomes, access to care, health care costs and financing, primary and managed care, new technologies, and other critical topics. Health services researchers pursue careers in many settings, including academia, professional organizations, research centers, health policy groups, clinical settings, and in federal, state, and local agencies.

The goals of the program are to enable students to conduct and interpret health services research, to formulate and analyze public health policy, to lead programs and organizations that address the health care needs of populations and to work directly with community members to empower them to be a part of the policy formulation process. In accomplishing these goals students in the program will develop the critical skills necessary to assemble and integrate qualitative and quantitative evidence applicable to problem formulation and policy analysis. They will be able to design viable programs, manage resources, and measure the effectiveness of service delivery to populations. Students will be awarded the Ph.D. in health services research after the completion of all University and program requirements for graduate degrees.

Requirements for Admission

Students are admitted to the Ph.D. program during the fall term only. Applications for admission are reviewed by the Ph.D. in Health Services Research Program admissions committee which includes the graduate program director. To qualify for admission, an applicant must meet the general University admission requirements at the graduate level as well as specific program requirements, including:

1. A completed master's degree from a program that is accredited by an appropriate specialized accrediting agency or from an institution of higher education that is regionally or nationally accredited; degrees such as M.D., J.D., and D.D.S. are also acceptable;
2. A minimum acceptable grade point average of 3.0 overall for the master's degree;
3. Acceptable total scores on the Graduate Record Exam (GRE); Verbal and Quantitative sections examined separately.
4. For those whose native language is not English a TOEFL score of at least 550 (213 for online version);
5. Official transcripts from all institutions of higher education attended;
6. A current curriculum vitae or resume;
7. Three letters of reference from sources capable of commenting on the applicant's readiness and commitment for doctoral studies. At least one, and preferably all letters should be from academic sources; other, letters must be from professional supervisors;
8. A 1500 word essay discussing the applicant's academic and professional goals. This essay should discuss how the Ph.D. in Health Services Research program will contribute towards meeting these goals.
9. A personal interview to discuss applicant's research focus and fit with the program faculty's expertise.

Prerequisite courses are necessary for students who do not have graduate preparation in basic statistics, research design, and basic computer literacy. Prerequisite courses in health delivery systems and community health may be required for students without academic preparation or experience in these areas.

Complete the application form and submit all required materials to the Office of Admissions, Old Dominion University.

Degree Requirements

1. Satisfactory completion of at least 60 semester hours of graduate level coursework, including all required courses as listed below. (Students who receive two or more grades of C+ or one grade of F may not continue in the program).
2. Two semesters of full-time residency. These do not have to be consecutive.
3. A health services research internship.
4. Acceptable performance on written and oral candidacy examinations in the major field of study at the end of the program coursework. Students may re-take the candidacy exams only once.
5. Successful defense of a dissertation proposal.
6. Completion of a dissertation representing the candidate's ability to conduct scholarly, original research. The quality of the research must be suitable for publication in an academic, peer-reviewed journal.
7. Successful oral defense of the dissertation.
8. Submission of the approved final copy of the dissertation.

Time frames for completion of degree requirement are as follows:

1. The entire process (from admission to dissertation defense) must be completed within eight years. Exceptions to this time limit require the approval of the graduate program director, the department chair, and the college dean.
2. Academic credit which is more than eight years old at the time of graduation must be re-validated by an examination before the work can be applied to a doctoral degree.
3. The dissertation must be completed within five years after the candidacy exams are passed.
4. Dissertations should be defended at least six weeks prior to the end of the semester in which the student expects to graduate.

Each student is required to have an advisory faculty member who will meet with the student after the first nine hours of coursework are complete. The faculty member, with the Graduate Program Director, approves the student's planned coursework (plan of study) and conducts the written and oral competency exams at the end of the coursework. Students must maintain a 3.0 grade point average.

Curriculum

The coursework consists of 12 credits of health services core courses, 18 credits of research core courses, six credits of health policy core courses and a six credit cognate area. A 1-credit colloquium is required each semester along with coursework (6 course series). Additionally students complete an internship (3 credits), a dissertation seminar (3 credits), and 12 dissertation credits. Up to 9 credit hours of coursework may be at the 600 level. Up to 12 hours of graduate credit may be transferred from another university and applied towards the Ph.D. degree. Transfer of credit is approved at the discretion of the guidance committee and the graduate program director.

The Health Services Core		12
HLSC 801	Introduction to Health Services	
HLSC 809	Multidisciplinary Approaches to Health Services Research	
HLSC 814	Theory in the Health Sciences	
HLSC 864	Health Economics	
Research Core		18
HLSC 810	Research Design and Application	
HLSC 811	Quantitative Research Methods in Health Care	
HLSC 812	Qualitative Research Methods	
HLSC 813	Measurement of Health Phenomena	
HLSC 846	Epidemiology	
HLSC 804	Methods of Program Evaluation	
Health Policy Core		6

HLSC 815	Decision Analysis in Health Care	
HLSC 872	Policy and Politics of Health	
Culminating Courses		6
HLSC 868	Internship in Health Sciences	
HLSC 881	Dissertation Seminar	
Dissertation		12
Cognate Courses *		6
Total Hours		60

* Cognate areas offer choices for students to specialize in an area inside and outside of the health arena. Students choose their cognate courses with the approval of their guidance committee. Some examples are:

- Epidemiology
- Education of Health Professionals
- Environmental Health
- Engineering Management
- Global Health
- Health Psychology
- Industrial and Organizational Psychology
- Modeling and Simulation
- Demography/GIS
- Other areas to be determined by students and faculty

Candidacy Exams (Written and Oral)

The candidacy examination is normally taken during the spring or fall semester of registration in the last formal graduate credits. Through the candidacy examination, the student's Advisory and Examination Committee in conjunction with the graduate program director shall ensure that the student has demonstrated a mastery of the subject matter in all fields of the program, has an adequate knowledge of relevant literature, and has the ability to identify, utilize, and apply research skills and techniques. To be eligible to take the examination, the student must meet the program requirements, must have completed or be in the semester of completing all coursework and the internship, must be recommended by his/her Advisory and Examination Committee, and must achieve at least a 3.0 GPA on all coursework taken within the program. Students need to apply to take the candidacy exam to the graduate program director by the specified deadline each semester. The application form must be submitted by February 10 to take the exam in the spring semester and by September 10 to take the exam in the fall semester.

Questions for the candidacy examination are based on coursework taken in the core, cognate and culminating areas and require a sophisticated demonstration of skills. The examination is comprehensive in nature and consists of written and oral components. The written section of the exam is taken over a two-day period. Questions for the written exam consist of the problem, case study, or scenario variety and require approximately twelve hours of writing time. The oral examination is taken only after all of the components of the written exam are passed, and must be taken in the same semester as the written exam. The oral examination is approximately one and one-half hours in length and permits an in-depth discussion of the written topics and other related materials. All parts of the examination are graded pass/fail. Students may retake the exam only once. Parts of the written exam that are not passed on the first attempt need to be re-taken when the exam is offered again. The oral exam can be re-taken in the same semester.

Dissertation (12 credits)

The candidate's program of study culminates in a dissertation representing an original research project which makes a real and significant contribution to health services knowledge and practice. The dissertation provides a demonstration of the student's ability to conduct independent scholarly research in health services research. The dissertation phase begins only after all other degree requirements (coursework, candidacy exams, dissertation seminar) have been completed. Towards this end, the candidate must form a dissertation committee, compose a letter of intent for the dissertation topic and have approved by the committee, and the college human subjects

committee or the ODU IRB, write and successfully defend a dissertation proposal, conduct the research necessary to complete the dissertation, write the dissertation, successfully defend the dissertation at an oral defense, make any necessary changes and submit a final approved copy. Additionally, all Ph.D. students are strongly encouraged to author at least one journal article based upon their dissertation research.

Dissertation Committee

After the candidacy exams are successfully passed, the dissertation committee is formed by the student in conjunction with, and approval by, the graduate program director. A dissertation committee must have at least three members, one of whom is from outside the department of the major field of study. The members of the dissertation committee must all hold doctorates and be graduate certified unless an exception first has been approved by the graduate program director, college dean, and appropriate VP. The committee's purpose is to supervise the entire process from proposal writing and defense through the oral defense of the dissertation. The committee supervises and approves the choosing of a topic, the choosing of a theoretical framework, the development of the research methods, the actual conduct of the research and the writing of the results.

Dissertation Letter of Intent

A dissertation starts with a letter of intent. The student will draft a 3-5 page description of the proposed study. This letter should contain the statement of purpose of the study and a brief description of why the topic is important to health services research. The letter should also identify the theoretical framework that will be employed, as well as provide an overview of the proposed methods. Where appropriate, the letter must include an addendum that indicates the student has permission to use the proposed data source and/or access the proposed population of interest. The dissertation committee needs to unanimously approve the letter of intent in order for the student to write and defend the dissertation proposal.

Dissertation Proposal

The dissertation proposal provides a detailed explanation of the research being proposed, and should address the significance of the study, provide a substantive literature review and describe, in detail, the methods that will be used to collect data. The proposal will be defended in a public forum to which are invited all faculty, staff and students in the college. The final draft of the dissertation proposal must be available for public viewing two weeks before the defense date. No formal work should begin on the dissertation until the dissertation committee and the graduate program director unanimously approve the dissertation proposal in writing. Dissertation proposals can be defended prior to IRB approval/exemption. However, no data collection or interaction with study participants can ever begin until the dissertation chair and the student have obtained IRB approval or exemption. Approval of the dissertation proposal is NOT a pro forma activity and the student is cautioned never to regard it as such.

Dissertation and Final Oral Defense

The completion of a dissertation is the cornerstone of the Ph.D. program. Through the dissertation, candidates demonstrate that they are prepared to join the company of scholars and to be leaders in health services research. The candidate should work closely with his/her dissertation committee throughout this process. Dissertations must be carefully prepared, publicly available for viewing, defended in a public forum and approved by the dissertation committee, the graduate program director and the college dean.

The dissertation committee plays a vital role in the completion of the dissertation. Candidates are expected to be in regular communication with the committee chair and members regarding the progress of the study, research results and manuscript drafts. While preparing a dissertation, candidates must be continuously enrolled for a minimum of one credit hour per semester. University resources may not be used unless a candidate is officially enrolled. Advice or assistance from committee members should not be expected unless the candidate is officially enrolled.

Dissertations must be carefully prepared according to ODU guidelines using the most current version of the Guide for the Preparation of Theses and Dissertations (obtained from the Office of Graduate Studies). The APA style

manual should be used to cover specific questions of style. However, the requirements of the Guide for the Preparation of Theses and Dissertations take precedence over all the guidelines contained in the APA manual. All proposed dissertation research which involves human subjects must be reviewed and approved by the college or University's Human Subjects Committee. The process and approval must be documented in the text of the dissertation. Once the dissertation is successfully defended and in its final form, the student should ensure that five copies of the dissertation (with all necessary signatures) are given to the Office of the University Registrar for binding and sign the microfilming and copyright agreements. Students can choose to have additional copies bound for their own personal use. All dissertations will be published in Dissertation Abstracts International.

Once the dissertation committee approves that the dissertation is ready, the student works with the dissertation committee to set a defense date and to ensure that the defense date is made public. The student should provide sufficient copies of the dissertation for public viewing at least two weeks before the defense date. The defense itself needs to be publicized two weeks in advance as well. While the defense is publicized and open to the public in general, care should be taken to ensure that all college faculty and administrators and all departmental students receive invitations to the defense. The entire dissertation committee must attend the final oral dissertation defense. After the dissertation defense, the dissertation committee meets in a closed-door meeting to discuss the dissertation defense and to vote on its approval or disapproval. If the dissertation is not approved, it can be defended only once more (no sooner than three months after the initial defense). The final dissertation must be approved through a signature process that includes the dissertation chair, all members of the dissertation committee, the graduate program director and the dean of the College of Health Sciences. Note that a dissertation may be approved orally at the final defense, but may still require some editing before the final copy is approved by the committee. The Doctor of Philosophy in Health Services Research will be awarded upon the oral defense of the dissertation, the submission of the final approved copy of the dissertation and the completion of all other program requirements for graduation.

Continuing Education Programs

Short courses, national conferences, workshops, refresher courses, certificate programs and seminars are offered by the different schools in the college on and off campus on a noncredit continuing education (CEU) basis. Professional continuing education programs cover a wide range of topics, including environmental health, dental hygiene, dental assisting, nursing, nuclear medicine technology, health-care management, medical technology, physical therapy, community health, mental health, and chemical dependency.

- Continuing education serves the following functions:
- licensure and certification for professionals and practitioners,
- credential and degree achievement and professional development to update knowledge and skills. Clientele served by the programs include nursing and allied health professionals, human service workers, managers and supervisory personnel, technicians, laboratory personnel, and health educators.

Visit the website to view current offerings.

School of Community and Environmental Health

3134 Health Sciences Building
757-683-4259
www.hs.odu.edu/commhealth/

Deanne Shuman., PhD, Interim Chair

The School of Community and Environmental Health offers graduate and certificate programs which lead to careers in health services research, public health, community health, health care administration, environmental health, and occupational safety. The Master of Science in community health offers practicing health care professionals the opportunity to complete their degrees in a distance format with emphasis areas in environmental health,

occupational safety and health, and industrial hygiene. ODU also offers a Master of Public Health degree in collaboration with Eastern Virginia Medical School.

Master of Public Health

The Master of Public Health (MPH) degree is an accredited professional degree offered by Eastern Virginia Medical School in collaboration with Old Dominion University. The program provides graduates with an understanding of the public health sciences and with knowledge and skills that can be utilized in healthcare management, population-based research and the community practice of public health.

The Program focuses upon four specialized tracks: Health Management, Epidemiology, Environmental Health, and Health Promotion. Students complete both didactic and experience-based courses. A community practicum exposes students to community organizations that support public health. The MPH degree will be granted jointly by the two sponsoring institutions. Classes are taught during three terms each year. Full-time students are expected to take six to eight credits hours per term. With this schedule, the required 42 credit hours could be completed in two years. Accommodation is made for part-time students who have up to 6 years to complete the course of study.

Eastern Virginia Medical School offers the tracks in Health Management and in Epidemiology. ODU offers the tracks in Environmental Health and in Health Promotion. All of the MPH core courses in the ODU Environmental Health and Health Promotion tracks are offered as distance learning courses, either web-based, televised, hybrid, or video streamed.

The Program will benefit health professionals who are or will be working in private, government or community organizations with the following responsibilities: assessing health status or needs in populations, designing and implementing programs, managing administrative functions, conducting program evaluation and outcomes research, developing coalitions to meet community needs, marketing health services, analyzing the epidemiology of specific diseases and measuring or assuring the quality of healthcare and public health services and products.

Accreditation

The State Council on Higher Education for Virginia approved the MPH program in 1999. The program has been fully accredited since 2000 by the Council on Education for Public Health (CEPH). This accreditation was renewed in 2012 for seven years.

Sponsoring Institutions

Old Dominion University is a publicly funded university, established as an independent college in 1962 and as a university in 1969. Eastern Virginia Medical School is an academic institution dedicated to medical and health education, biomedical research and the enhancement of healthcare in eastern Virginia. EVMS and ODU have a long history of collaboration that includes several joint degree programs. Classes are held on weekday afternoons or evenings and/or on Saturdays on the EVMS and ODU campuses in Norfolk, Virginia. Courses are taught by faculty from both institutions.

MPH core courses are held at both the EVMS and ODU campuses, and may be offered as distance courses with a classroom option for local students. The Environmental Health and Health Promotion track courses are provided at the ODU campus as distance learning courses. Health Management and Epidemiology track courses are held at EVMS.

Students in the Environmental Health or Health Promotion tracks are advised by the MPH faculty at ODU. Students in the Health Management and Epidemiology tracks are advised by MPH faculty at EVMS.

Curriculum

The educational program includes 42 total credit hours. Core courses consist of 18 credit hours in Principles of Epidemiology, Health Education & Behavioral Science, Ethics in Public Health Practice, Introduction to Biostatistics, Health Administration and Organization and Environmental Health.

In addition to the core courses, students concentrate on courses in Epidemiology, Health Management, Environmental Health, or Health Promotion for an additional 9-12 credit hours. The remaining credit hours are earned through Selectives or Electives, a Community Practicum, and a Capstone culminating experience. For more detailed information on the Joint ODU/EVMS Master of Public Health Program visit:

http://www.evms.edu/education/masters_programs/graduate_program_in_public_health/

Admission to the Program

Application to the Program

All applications for the MPH program are made through EVMS. ODU participates in the decision process for candidates for the environmental health and health promotion tracks. Admission requirements may be found at: <https://secure.visualzen.com/vzcollegeapp/evms/default.aspx>.

To start an application go to the web site at <https://secure.visualzen.com/vzcollegeapp/evms/default.aspx>.

Application Procedure

Complete the online application, including personal statement and \$60 application fee payable to EVMS;

Using the online application system, submit three letters of recommendation;

Submit official transcripts from all colleges and universities attended, from the registrar at those institutions;

Submit a Graduate Record Examination (GRE) score, taken within the last five (5) years, sent directly from the Educational Testing Service;

The EVMS Admissions Committee may request a personal interview to complement the information contained in the application materials. Potential applicants are encouraged to ask questions about the program through e-mail, telephone calls, or scheduling an appointment with the Program Director.

Application materials are considered on a rolling basis, starting September 1 (one year before desired matriculation) and are considered until all positions are filled.

Those U.S. students seeking financial assistance are advised to submit their applications as early as possible. Students may begin studies only in the fall term of each year.

Official transcripts should be mailed to the EVMS Director of Enrollment for Health Professions at the address shown below. If you experience technical difficulties or related problems in completing your online application, please contact:

Graduate Program in Public Health
Attention: Director of Enrollment for Health Professions
Eastern Virginia Medical School
P.O. Box 1980
Norfolk, Virginia 23507-1607
Tel: (757) 446-7153 or (757) 446-7096
Fax: (757) 446-8915

Prerequisite Courses:

For the Environmental Health track, students must have 8 credit hours each of biology, chemistry, and either physics (with a lab) or a geological science, and one course in either general college mathematics or statistics at the undergraduate level or graduate level.

For the Health Promotion, Health Management, and Epidemiology tracks there are no specific prerequisite courses.

For additional information about the MPH in the Environmental Health or the Health Promotion track, please contact the Track Coordinator at 757-683-4259.

Tuition

Tuition costs for Master of Public Health (MPH) students are based upon the number of credit hours taken per semester. Tuition is paid to EVMS for all courses, including ODU track courses. Tuition is due at the beginning of each term of your enrollment. There is no tuition difference for in-state and out-of-state residents. Additional costs to the student budget are fees, books, room/board and transportation. All fees are due at the beginning of the first term of each year.

The MPH student budget is available online at http://www.evms.edu/education/masters_programs/graduate_program_in_public_health/tuition_fees/. Tuition and fees are subject to change. Federal financial aid is not available to international students.

Students must show proof of major medical insurance coverage. Students who are eligible for coverage under the policy of a parent or spouse are urged to remain so. As an alternative, EVMS offers a student health insurance plan for an estimated \$2,657 per year.

Non-Matriculated Students:

Students who are not seeking the Master of Public Health degree may, on a space-available basis, take up to three courses (9 credit hours) offered by the Program. If the student is later admitted to the MPH Program, the credit hours may be applied to the degree and the total tuition for the MPH degree adjusted to reflect the amount the student has already paid as a non-matriculate student. To apply as a non-matriculate student please complete the online application by clicking the link to Apply Online at http://www.evms.edu/education/masters_programs/graduate_program_in_public_health/admission_requirements/.

Curriculum

MPH Program Requirements

This is a 42 hour curriculum including a public health related capstone project that demonstrates the knowledge and the skill set to assume increasingly responsible positions in the public health sector are required to earn the MPH in any of the specialty tracks. Information on the ODU Environmental Health and Health Promotion track courses or the EVMS Epidemiology and Health Management tracks, can be found at http://www.evms.edu/education/masters_programs/graduate_program_in_public_health/abo

Master of Science - Community Health

757-683-4594

http://hs.odu.edu/commhealth/academics/ms_commhealth/

Anna Jeng, SCD, Graduate Program Director

The School of Community and Environmental Health offers a Master of Science in Community Health with an emphasis in environmental health. The emphasis is designed to meet the needs of students seeking graduate education in the environmental health field. The goal of the program is to provide advanced understanding of human health efforts due to interactions with chemical, biological, and physical agents in natural and man-made environments. Students may shape the emphasis area to meet their needs in general environmental health, industrial hygiene, occupational safety, or hazardous materials management.

Admission

The selection of community health students is based on several criteria. To qualify for admission, an applicant must meet the general University admission requirements at the graduate level. In addition, the School of Community and Environmental Health requires:

1. Two letters of recommendation from teachers, supervisors, and/or employers.
2. Evidence of a basic foundation of undergraduate courses in the life sciences, behavioral sciences, and social sciences with a minimum 2.80 grade point average. If it is determined that a student is deficient in one of these three general foundation areas, he or she may be

required to take additional course work prior to admission or to enroll in undergraduate course work to strengthen the foundation area.

3. A satisfactory Graduate Record Examination (GRE) aptitude score.
4. Work experience or voluntary participation in a health-related agency or program will be evaluated as part of the student's admission package. Students can be admitted who do not have work or volunteer experience, however, students without experience will be required to produce a portfolio of health related volunteer or work experiences that they have acquired during their time in the program.
5. A career-goals paper. This paper asks the applicant to discuss his or her career goals and the relationship of the community health graduate program to those goals. This paper is evaluated by the faculty of the school for the applicant's ability to present a clear sense of professional purpose, as well as his or her ability to write a concise and grammatically acceptable paper.

Requirements

The curriculum includes a 24-credit hour core of environmental and community health courses that constitutes the foundation of the program complemented by a minimum of six credit hours of practicum experience or six hours of thesis research.

Core Courses

CHP 600	Principles of Community Health	3
ENVH 600	Principles of Environmental Health Science and Protection	3
CHP 640	Statistical Reasoning for the Health Professions	3
ENVH 603	Environmental Epidemiology	3
CHP 601	Research Design and Evaluation in the Health Professions	3
ENVH 602	Environmental Health Law and Policy	3
ENVH 643	Principles of Toxicology	3
ENVH 566	Environmental Risk Assessment and Decision Analysis	3
Total Hours		24

Comprehensive Examinations

All candidates for the Master of Science in community health must pass a written and an oral comprehensive examination covering the course work in the program of study. Comprehensive examinations are administered once a semester during the fall and spring sessions.

Thesis or Practicum Option. Students must complete a six credit practicum (CHP 669) or a six credit thesis (CHP 698).

Environmental Health Concentration Area

This emphasis has specific prerequisite courses at the undergraduate level that must be met. Also, admission to the program is at the discretion of the faculty. In addition to the core course requirements, there are specific course requirements for each concentration area.

Prerequisite Courses.

General Biology	8
General Chemistry	8
One of the following:	8
Introduction to Physics (with a lab)	
Ocean, Earth, and Atmospheric Sciences	
One of the following:	3
General College Mathematics	
Statistics	
Total Hours	27

Concentration Area Requirements

12 to 13 credit hours from the following courses or their equivalents must be taken in one of the following options in order to be eligible for the degree.

General Environmental Health:

ENVH 520	Communicable Diseases and Their Control	3
ENVH 521	Food Safety	3
ENVH 522	Water and Wastewater Technology	3
ENVH 523	Vector Control	3
ENVH 524	Residential and Institutional Environments	3
ENVH 545	Air Pollution and Its Control	3

Industrial Hygiene:

ENVH 526	Physical Hazards and Their Control	3
ENVH 540	Principles of Ergonomics	3
ENVH 541	Industrial Hygiene	3
ENVH 542	Sampling and Analysis Laboratory	2
ENVH 545	Air Pollution and Its Control	3
ENVH 546	Physical Hazards Laboratory	2
ENVH 570	Industrial Environmental Management	3
ENVH 822	Control of Hazards in the Workplace	3

Hazardous Materials Management:

ENVH 545	Air Pollution and Its Control	3
ENVH 546	Physical Hazards Laboratory	2
ENVH 561	Hazardous Waste Management	3
ENVH 565	Hazardous Materials Management	3
ENVH 722	Control of Hazards in the Workplace	3

Occupational Safety:

ENVH 501	Occupational Health	3
ENVH 506	Principles of Occupational Safety and Health	3
ENVH 507	Occupational Safety Standards, Laws and Regulations	3
ENVH 525	Occupational Safety and Health Program Management	3
ENVH 526	Physical Hazards and Their Control	3
ENVH 570	Industrial Environmental Management	3

Certificate in Occupational Safety

Jim English, Coordinator, jenglish@odu.edu

The certificate program in occupational safety is designed to prepare students to meet safety standards and guidelines in such areas as business, education and industry with the goal of managing operations to minimize financial losses resulting from accidents, health claims, legal actions, and property damage. It is especially attractive to students in majors such as engineering, occupational and technical studies, and business who may reasonably anticipate assignment of safety as an additional duty, or to individuals already employed in the occupational health and safety field. Course taken for the Certificate may also be used to qualify for safety positions, enhance the qualifications of Certified Safety Professional (CSP) and Certified Industrial Hygienist (CIH) candidates, and provide maintenance points for professionals holding the CSP or CIH certifications. Courses in the certificate program may be taken through degree or non-degree programs, and may be applied to degree requirements at the graduate level in environmental health. For completion of the graduate certificate program students must have a minimum cumulative grade point average of 3.00 in all courses taken toward the certificate. After successful completion of the program, a Certificate in Occupational Safety will be awarded.

A total of 15-16 semester hours is required, comprised of three core courses and six to seven hours of electives. All course, with the exception of the lab course, are provided as distance learning, either as televised or web-based courses. There are no prerequisites.

Core courses include:

Core Courses		9
ENVH 506	Principles of Occupational Safety and Health	
ENVH 525	Occupational Safety and Health Program Management	
ENVH 507	Occupational Safety Standards, Laws and Regulations	3
Select two of the following electives:		6-7
ENVH 501	Occupational Health	
ENVH 526	Physical Hazards and Their Control	
ENVH 540	Principles of Ergonomics	
ENVH 541	Industrial Hygiene	
ENVH 542	Sampling and Analysis Laboratory	
ENVH 546	Physical Hazards Laboratory	
Total Hours		18-19

Accelerated Program – Bachelor of Science in Environmental Health (B.S.E.H.) to Master of Science in Community Health

Accelerated Program – Bachelor of Science in Environmental Health (B.S.E.H.) to Master of Public Health (MPH)

Bachelor of Science in Environmental Health (B.S.E.H.) students who have a 3.00 GPA and have senior standing may apply for acceptance into the Bachelor of Science in Environmental Health to M.S. in Community Health accelerated program or to a Master of Public Health (MPH). This program allows gifted undergraduate B.S.E.H. students the opportunity to take up to 12 semester hours of graduate course work and apply them to both degrees. Other restrictions apply. Students interested in this program should contact the B.S.E.H. program director James English at 757-683-6010 for more information.

Gene W. Hirschfeld School of Dental Hygiene

2011 Health Sciences Building
757-683-3338
<http://hs.odu.edu/dental/academics/ms/about.shtml>

Master of Science - Dental Hygiene

757-683-5150
<http://www.odu.edu/dental>

Gayle McCombs, Graduate Program Director

The challenge of effecting change in the scope and direction of dental hygiene and health care requires competencies in collaborative problem solving, evidence-based and ethical decision making, and leadership.

Recipients of the Master of Science degree in dental hygiene develop skills to meet complex national and global health challenges in interprofessional education, knowledge-generation, information transfer, and health care for all members of society. Within a multidisciplinary, multicultural curricular framework that integrates theory, research, and practical experience, the competency-based program links the goals and career aspirations of the student with relevant learning experiences, technologies, and resources to facilitate career advancement. Through specialized skills training, graduates are prepared to assume leadership roles necessary for quality professional dental hygiene care and advancing knowledge and practice.

Solutions to complex health problems need the participation of dental hygienists educated in community health, research, management, education, public policy, and advocacy, just to name a few. Therefore, the program offers distinct specialty areas in which students may specialize: education, administration/management, research, marketing, community health, global health and modeling and simulation.. Although graduate education focuses

on developing a specialty, such specialization is viewed as secondary to generating evidence-based knowledge and theory through research. Demand for master's level dental hygienists in these key areas of specialization continues to be strong and students are able to develop competencies essential in today's employment market.

Applicants are encouraged to contact the graduate program director to obtain additional information regarding requirements, experiential credit, cognate offerings, travel abroad, practica and externship opportunities. The program is available on campus, online, or as a hybrid of the two. Up to 12 approved graduate credit hours also can be taken at another university and applied toward degree requirements, making this program one of the most flexible in the nation. Other advantages of graduate study at Old Dominion University include the opportunity to engage in learning within the state-of-the-art Dental Hygiene Care Facility and Dental Hygiene Research Center, the hub for independent investigations with other scholars both within and external to the University; the student-focused, nationally and internationally recognized faculty committed to the educational preparation of dental hygienists leading to degrees at advanced levels; and the opportunity to segue to doctoral education in health services research within the College of Health Sciences.

Competencies for the Master of Science in dental hygiene program are found at <http://www.hs.odu.edu/dental/academics/ms/msdhcompetencies.pdf>.

Admission Information

To qualify for admission, the applicant must possess a certificate or associate degree from an accredited dental hygiene program and a baccalaureate degree in dental hygiene or a related field. The applicant must have an overall grade point average (GPA) of at least 2.80 (on a 4.00 scale) in undergraduate education and a minimum of 3.00 in the undergraduate dental hygiene major.

For consideration, the following documents must be submitted to Graduate Admissions, Old Dominion University, 220 Rollins Hall, Norfolk, VA. International Students must submit their documents for consideration to the Office of International Admissions, Old Dominion University, 2101 Dragas Hall, Norfolk, VA 23529.

1. Graduate Application.
2. Scores from the National Board Dental Hygiene Examination Note: International dental hygiene students who have not graduated from an CODA accredited dental hygiene program and who do not have National Board Dental Hygiene scores, will be considered for admission.
3. Recommendation forms from previous clinical supervisor and dental hygiene program director (form provided).
4. Two letters of recommendation from academic sources (form provided).
5. Formal written statement of personal goals and objectives.
6. Self-evaluation form.
7. Clinical self- assessment.
8. International applicants must present satisfactory evidence of competence in English by submitting score of at least 550 on the TOEFL or 79 on the TOEFL iBT.
9. GRE or Millers Analogy scores (only if you are interested in competing for a University Fellowship).
10. Bachelor's degree in dental hygiene or a related field and, in the latter case, have completed an accredited certificate or associate degree program in dental hygiene.
11. Evidence of an undergraduate overall quality point average of at least 2.8 and an average in the dental hygiene major of 3.0 (on a 4.0 scale).
12. Official transcripts of all college work.

Students can apply online at the Office of Admissions (<http://www.odu.edu/admission/apply>) website.

Visit: International Admissions at: <http://www.odu.edu/internationaladm>.
Visit: International Student and Scholar Services at: <http://www.odu.edu/iss>.

Applicants whose qualifications are slightly below the required level will be considered for admission to provisional status and may be required to take additional course work. The master's degree program is available under the Southern Regional Education Board's (SREB) Academic Common Market. Applicants who are legal residents of Delaware, Kentucky, Mississippi, or South Carolina may enroll, if accepted, as Academic Common Market students at in-state tuition rates. Students also may be required to take undergraduate courses or non-credit courses to make-up deficiencies in other areas.

For additional information, visit <http://www.schev.edu/students/Acmvainstable.asp>.

Degree Requirements

Students must complete all courses within a six-year time period with a minimum GPA of a 3.0 on a 4.0 scale. Students must also successfully present and defend a thesis research or non-thesis project and pass an oral comprehensive examination. Students not graduating from the BSDH program at Old Dominion University must also pass a writing examination.

Competencies for the Master of Science in dental hygiene program are found at <http://www.hs.odu.edu/dental/academics/ms/msdhcompetencies.pdf>.

Thesis degree requirements include a minimum of 34 semester hours
Non-Thesis degree requirements require 37 semester hours

Curriculum Core Requirements. All core requirements may be taken on campus, online or hybrid. Candidates are required to fulfill a 22 credit hour core requirement to include:

Core Courses	22
DNTH 514 Educational Concepts for the Health Professional I	
DNTH 515 Research Methods in the Health Sciences	
DNTH 516 Administrative Leadership and Professional Development	
DNTH 604 Clinical Administration and Teaching	
DNTH 660 Educational Concepts for the Health Professional II	
DNTH 668 Internship	
MPHO 612 Statistical Reasoning for Public Health	
or FOUN 722 Introduction to Applied Statistics and Data Analysis	
or HLSC 746 Epidemiology	

Specialty Areas (Sample Courses; others may apply) "Courses Subject to Change" 6-12

Education	
COUN 601 Principles of Professional Counseling and Ethics	
COUN 633 Counseling and Psychotherapy Techniques	
TLED 616 Design for Effective Instruction	
TLED 640 The Management of Learning and Instruction	
IDT 617 Foundations of Instructional Technology	
IDT 746 Foundations of Distance Education	
IDT 756 Instructional Gaming: Theories and Practice	
IDT 763 Instructional Design Theory	

Administration/Management	
MGMT 602 Organizational Management	
MGMT 618 Issues in Human Resource Management	
PADM 733 Legal and Ethical Foundations of Public Administration	
PADM 724 Administration of Human Services	

Research	
HLSC 712 Qualitative Research Methods	
HLSC 713 Measurement of Health Phenomena	
CHP 601 Research Design and Evaluation in the Health Professions	

CHP 715 Decision Analysis in Health Care	
CHP 773 Developing Grants and Contracts in Health Professions	

Marketing	
MKTG 603 Marketing Management	
MKTG 640 Global Marketing Management	
CHP 630 Health Care Marketing	
MPHO 630 Social Marketing for Health Populations	

Community/Public Health	
HLSC 864 Health Economics	
HLSC 872 Policy and Politics of Health	
HLSC 701 Introduction to Health Services	
ELS 610 School Community Relations and Politics	
HPRO 670 Cultural Issues in Health Promotion and Education	
MPHO 615 Health Services Administration in Public Health	
MPHO 613 Environmental Sciences for Public Health Practice	
MPHO 610 Introduction to Public Health Practice	
MPHO 611 Social and Behavioral Sciences for Public Health	
MPHO 614 Epidemiology for Public Health Practice	
MPHO 672 Policy and Politics in Public Health	
MPHO 691 Grant Writing for Public Health Practice	
HLSC 772 Policy and Politics of Health	
CHP 646 Epidemiology	

Modeling and Simulation (Certificate Option) 12 hrs (2 core courses)

MSIM 601 Introduction to Modeling and Simulation	
HLSC 815 Decision Analysis in Health Care	
Two additional electives as determined by Modeling and Simulation Program Coordinator	

Global Health (Certificate Option) 15 hrs

HLSC 746 Epidemiology	
HLSC 702 Health Management	
HLSC 776 Global Health	
Elective courses (4 credit hrs) As determined by Director of Global Health	
Practicum (2 credit hours) As determined by Director of Global Health	

Non-Thesis and Thesis Option

DNTH 698 Research	3
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Thesis Option requires the addition of DNTH 699

DNTH 699 Thesis	3
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Total Hours 34-37

Thesis Option. (34 credit hours). This option requires original thesis research and writing for a total minimum program requirement of 34 credit hours and is considered essential for students interested in developing investigative and data management skills. The student is encouraged to become familiar with possible research areas soon after admission and contact the graduate program director to discuss the research proposal, funding options and the selection of the thesis committee. The student will be provided with a committee consisting of the thesis advisor and two other faculty members selected by the graduate program director and the student. Prior to beginning the research, the student will present a written proposal to the thesis committee for approval. Candidates choosing the thesis option must satisfactorily complete the thesis at least four weeks prior to graduation with copies delivered to the thesis committee. An oral comprehensive examination and thesis defense will be conducted by the student's thesis committee during the last four weeks of the semester prior to graduation.

The cost of the thesis is a student expense. The thesis option is not available to distance learning (on-line) students.

Non-Thesis Option. (37 credit hours). Candidates are required to complete: DNTH 698 (3 credits) and a minimum of three (3) additional credits of approved elective course work. This option is designed for students pursuing a less research-oriented program of study. A student in this program is required to complete an in-depth term paper or execute a modest project as approved by the faculty. An oral comprehensive examination and project defense will be conducted prior to graduation.

Writing Proficiency. Students who do not hold an undergraduate degree from Old Dominion University are required to participate in diagnostic writing exercises for evaluation by the staff of the Testing Center. Each student is responsible for making an appointment with the Testing Center to complete this requirement early in the first semester of graduate studies. Students deemed deficient in writing skills will be required to remedy their deficiency through the services of the Writing Center prior to the completion of 15 graduate credits. Students who fail to participate in the diagnostic writing exercise or to complete recommended developmental work through the Testing Center will not be allowed to register for subsequent semesters.

All faculty members in the school require written assignments, which will be evaluated on the basis of form and content. If needed, resources are available through the Writing Center. Graduate students and faculty employ the current edition of the Publication Manual of the American Psychological Association as the standard reference text for written assignments within the School of Dental Hygiene.

Dental Hygiene Research Center

The ODU Dental Hygiene Research Center (DHRC) is dedicated to conducting quality, multidisciplinary, clinical, and population-based research to explore diagnosis, pathogenesis, and treatment of conditions that are related to overall health and dental hygiene. The DHRC, officially sanctioned by the University in 2000, is the first facility in the world dedicated solely to dental hygiene research. The DHRC strives to advance oral and general health through interdisciplinary and multidisciplinary research in collaboration with other academic institutions, medical facilities, private industry, and the community. The DHRC represents a research paradigm unique for graduate education in that no other dental hygiene program has such a facility. Research is an integral and essential component of the School of Dental Hygiene's mission. Students experience the link between theory and practice, and collaborate with faculty to create new knowledge via discovery, apply evidence-based findings, and disseminate information through professional publications and presentations.

Accelerated Bachelor's to Master's Program

Dental hygiene students who have a 3.25 grade point average from each institution attended and who have senior standing may apply to the bachelor's to master's accelerated program. This program allows gifted undergraduate students the opportunity to take up to 12 semester hours of graduate coursework and apply them to both degrees. Consult with the graduate program director for more information.

International Dental Hygiene

The School of Dental Hygiene, committed to solving global oral health problems, offers a variety of service learning programs in partnership with non-governmental agencies, academic institutions, and private organizations worldwide. Faculty-led experiences offer unique opportunities for students to travel abroad, develop cross-cultural competence, experience global health challenges, and engage in projects that advance oral health worldwide. International locations are determined by the School of Dental Hygiene in conjunction with the Office of Study Abroad. Program participation requires approval from the School of Dental Hygiene and the Office of Study Abroad. A certificate in Global Health is available, administered through the Center for Global Health and the School of Dental Hygiene.

School of Medical Diagnostic and Translational Sciences

Modeling and Simulation Certificate in Health Sciences

Gianluca DeLeo, PhD, MBA, Program Coordinator

The Modeling and Simulation in Health Sciences certificate program is designed for students to develop competency in the use of modeling and simulation theory, methods and technologies to support health sciences research, policy-making, and training in the health care domain. The core course of this program covers the basic knowledge of Modeling and Simulation while the other three courses focus on the applications of M&S in health care related fields.

This program is targeted to graduate students interested in pursuing a career in modeling and simulation in health care or graduate students enrolled in the PhD program at the College of Health Science who desire to focus their research and/or course of study in modeling and simulation. The expected time to complete the certificate is four semesters.

Admission to this certificate program requires a bachelor's degree (or equivalent) and a previous knowledge of calculus and statistics. The basic certificate requirements are four three-hour courses for a total of twelve required credits. The basic simulation core class called Introduction to Modeling and Simulation of three credits is required, plus nine credits of discipline specific classes. A 3.00 GPA for the four-course sequence is required for successful completion. Total amount of credit: 12

MSIM 601	Introduction to Modeling and Simulation	3
HLSC 815	Decision Analysis in Health Care	3
	Discipline Specific Class	3
	Discipline Specific Class	3
Total Hours		12

Since Modeling and Simulation is a highly multidisciplinary science, other colleges can offer discipline specific classes, such as:

BIOL 772	Modeling and Simulation in the Life Sciences	4
PSYC 731	Human Cognition	3
BIOL 732	GIS in the Life Sciences	3
BNAL 722	Agent-Based Simulation and Modeling	3

Molecular Diagnostics Certificate Program

www.hs.odu.edu/medlab/academics/mdiag/

Robert Bruno, PhD, Program Director

The discipline of molecular diagnostics includes all tests and methods to identify disease, a predisposition for a disease, diagnosis and prognosis of disease, and potential responses to drug therapy by analysis of an individual's DNA, RNA, and proteins. Molecular technology is now widely applied to infectious disease, genetics testing, identification of methicillin-resistant *Staph aureus* (MRSA), cancer diagnosis and metastasis, forensic science, and personalized medicine.

The post-baccalaureate molecular diagnostics certificate program is designed to provide fundamental principles, advanced applications and laboratory skills needed for molecular diagnostic and molecular biology procedures conducted in clinical and research environments.

The Certificate is awarded upon completion of 12 credit hours in a coherent sequence with a 3.0 GPA.

Required Courses		12
MDTS 500	Principles of Molecular Pathology and Clinical Diagnostics	3
MDTS 501	Molecular Diagnostics Laboratory	3

MDTS 600	Advanced Clinical Applications of Molecular Diagnostics	3
MDTS 601	Advanced Molecular Diagnostics Laboratory	3
Optional Course		3
MDTS 668	Clinical Laboratory Internship	3
Total Hours		30

School of Nursing

www.hs.odu.edu/nursing

3009 Health Sciences Building
757-683-4298

Karen Karlowicz, Chair

The program leading to the Master of Science in Nursing is designed to prepare graduates with expertise in theory, research, and advanced nursing practice. Through academic courses and clinical experiences, graduate students are prepared to meet the present nationwide demand for nurses in advanced practice, leadership and education as well as to pursue doctoral study. The master's program in nursing is fully accredited by the Commission on Collegiate Nursing Education.

Students in the program may specialize in a variety of roles. All specialties emphasize development of the nursing role through advanced theory and research. The program strives to instill in its graduates leadership responsibility, professional commitment, and a holistic approach to health and nursing care.

The number of credits required for the Master of Science in Nursing degree varies and reflects the number of hours in the core plus the hours required for certification in a specialty. The nurse anesthesia role option requires 82 credits. The family nurse practitioner role option requires 47 credit hours. There is a joint program with Shenandoah University in nurse midwifery that is 47 credits. Adult-Gerontology Clinical Nurse Specialist/Educator program is 46 credits.

Post-master's certificate programs for M.S.N. educated nurses to complete coursework leading to certification as a family nurse practitioner, adult gerontology clinical nurse specialist, nurse educator or nurse executive are available.

Admission to the Graduate Program

- In addition to meeting University and college requirements, applicants must have:
- Completed a baccalaureate degree with an upper-division major in nursing from a National League for Nursing accredited college or university program, or Commission on Collegiate Nursing Education accredited college or university program or the equivalent.
- Demonstrated graduate potential by satisfactory scholastic achievement in the baccalaureate nursing program (grade point average of 3.00 on a 4.00 scale).
- Completed an undergraduate course in statistics.
- Completed a health assessment component (undergraduate)
- Attained a satisfactory score on the Miller Analogies Test (MAT) or the Graduate Record Examination (GRE), taken within the past five years.
- A current license as a registered nurse.
- At least one year of recent clinical nursing experience. Applicants for the nurse anesthesia role must have at least a minimum of one year (2080 hours) of full time nursing experience in an intensive care unit within the 2 years prior to application.
- Presented three letters of professional reference, including one from the dean or a member of the nursing faculty in the baccalaureate program in nursing and two from the most recent employer.
- Completed the Supplementary Application for Admission to the Master of Science in Nursing Program, including the short essay (500 to 700 words) describing professional and academic goals, and how graduate study in nursing will contribute to the fulfillment of these goals.

An interview may be advised for prospective students. Students applying to the nurse anesthesia program should contact the director of the nurse anesthesia program at (757) 368-4171. For full consideration, applications for the nurse anesthesia program must be submitted by December 1 of the year prior to the August starting date.

Degree Requirements

In addition to general University requirements, the following apply to candidates for the Master of Science in Nursing degree:

- Only degree-seeking students may take graduate nursing courses.
- Full-time or part-time study is available for most roles. Part-time students are required to complete all program requirements within a six-year period. Some roles have only full-time programs. Contact the graduate nursing office regarding study options for each program at (757) 683-4298.
- A written comprehensive examination covering the program of study is required by the final semester of study for students not electing to complete a thesis. A comprehensive examination in the role specialty is required for all postmaster's students. A student must be registered in the semester the comprehensive exam is taken.
- The student must make arrangements three months in advance to take a nursing course with a laboratory or practicum component to assure appropriate and available placement for the learning experience. Arrangements are made through the Student Clinical Services Coordinator.
- The B grade (3.00) is the minimal acceptable grade for all courses with a NURS or NURA prefix or any course required for the degree for continuation in the master's program. Satisfactory performance in the laboratory or practicum component of a nursing course is required. Students achieving less than a B grade (3.00) in a nursing course may request an opportunity from the role graduate program director to repeat the course once. Two course failures will result in termination from the nursing program. Students may not progress with an incomplete in prerequisite courses as listed in the curriculum plan.

Additional requirements such as physical exams, CPR certification, immunization requirements, professional liability insurance, computer competencies and technical standards and background checks for the School of Nursing are also available in the Nursing Student Handbook and on the School of Nursing web page.

Master of Science in Nursing – Family Nurse Practitioner Role

Micah Scott, Graduate Program Director

The family nurse practitioner (FNP) role prepares graduate students to provide a full range of primary care services to individuals and families throughout the life span. In collaboration with other health care professionals, graduate students provide health promotion, health maintenance and restorative care to well, at-risk, and chronically ill clients and their families. Student clinical experiences are provided in a variety of primary care settings. Successful completion of the program qualifies students to register for the AANP or ANCC examination for certification as a family nurse practitioner.

Degree Requirements

Full-time curricula are available. No FNP course may be taken unless admitted to the FNP program. Unless specifically stated, all courses in the previous semester must be completed before taking courses in the subsequent semesters. Course work must be completed according to the full-time curriculum. The following courses are prerequisites to all FNP content course and clinical courses.

NURS 661	Pharmacotherapeutics for Primary Health Care Providers	3
NURS 670	Advanced Pathophysiology	3

NURS 671	Advanced Physical Assessment	1
NURS 672	Advanced Physical Assessment Laboratory	1

FNP Full Time Curriculum

First Semester (Fall)

NURS 610	Theoretical Foundations for Nursing Practice	3
NURS 661	Pharmacotherapeutics for Primary Health Care Providers	3
NURS 670	Advanced Pathophysiology	3
NURS 671	Advanced Physical Assessment	1
NURS 672	Advanced Physical Assessment Laboratory	1
NURS 719	Family and Community Primary Care Assessment	1

Second Semester (Spring)

NURS 611	Research Design	3
NURS 663	Health Promotion and Maintenance	2
NURS 664	Primary Care for Women	3
NURS 665	Advanced Family Nursing I Practicum	2
NURS 762	Advanced Family Nursing I: Management of Acute Illnesses	3

Third Semester (Summer)

NURS 613	Issues in Advanced Nursing Practice	3
NURS 621	Aging in the 21st Century	3
NURS 705	Primary Care Approaches for Children	3
NURS 764	Advanced Family Nursing II Practicum	4

Fourth Semester (Fall)

NURS 765	Advanced Family Nursing II: Management of Chronic Illnesses	3
NURS 767	Advanced Family Nursing III Practicum	5
NURS 768	Nursing Seminar in Complex Health Problems	1
NURS 690	M.S.N. Comprehensive Examination	0

Total Hours		47
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Master of Science in Nursing – Nurse Anesthesia Role

Nathaniel Apatov, Graduate Program Director

The Master of Science in Nursing program in nurse anesthesia is an 82-credit, 28-month program beginning in late August. During the first year, the program is designed to introduce students to the basic theoretical knowledge and skills necessary for advanced nursing practice in nurse anesthesia. The first 12 months of the program are primarily didactic. The last 16 months of the program are the clinical component comprised of both general and regional anesthesia techniques for surgery and clinical specialties such as eyes, ears, nose and throat, neurosurgery, vascular surgery, open heart, obstetrics, trauma, and organ transplants. During this phase of the program, the student returns to the classroom on a weekly basis for extensive clinically related study.

Upon successful completion of the 28-month program, the graduate receives the M.S.N. degree, and becomes eligible to write the National Certifying Examination for Nurse Anesthetists given by the Council on Certification of Nurse Anesthetists. Graduates successfully completing this exam become Certified Registered Nurse Anesthetists (CRNAs).

A prerequisite for enrollment in the first year first semester is degree seeking status and admission to the MSN-Nurse Anesthesia track. Successful completion of courses in the previous semester is a prerequisite for enrollment in the next semester. All courses within a semester are corequisites and must be taken together.

Nurse Anesthesia Full Time Curriculum

First Semester (Fall)

NURS 611	Research Design	3
NURS 646	Structure and Function for Advanced Nursing Practice I	3
NURA 660	Pharmacotherapeutics for the Nurse Anesthetist	3
NURA 650	Medical Physical Sciences	3
NURA 654	Professional Aspects of Anesthesia	3

Second Semester (Spring)

NURS 610	Theoretical Foundations for Nursing Practice	3
NURS 647	Structure and Function for Advanced Nursing Practice II	3
NURA 651	Pharmacology of Anesthesia Drugs	4
NURA 652	Principles of Anesthesia Practice I	4

Third Semester (Summer)

NURA 653	Principles of Anesthesia Practice II	4
NURA 754	Anesthesia Practicum	4
NURS 648	Disease Processes for Advanced Practice	3
NURS 671	Advanced Physical Assessment	1
NURS 672	Advanced Physical Assessment Laboratory	1

Fourth Semester (Fall)

NURA 655	Principles of Anesthesia Practice III	4
NURA 755	Clinical Practicum A	6

Fifth Semester (Spring)

NURA 756	Clinical Practicum B	10
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Sixth Semester (Summer)

NURA 757	Clinical Practicum C	10
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Seventh Semester (Fall)

NURA 758	Clinical Practicum D	10
NURS 690	M.S.N. Comprehensive Examination	0

Total Hours		82
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Master of Science in Nursing - Adult Gerontology Clinical Nurse Specialist/Educator Role

Debra Murray, Graduate Program Director

The School of Nursing offers a curriculum leading to the degree of Master of Science in Nursing with an advanced practice area of Adult Gerontology Clinical Nurse Specialist/Educator. The program of study prepares students as expert clinicians in the application of evidence-based knowledge within the realms of nursing interventions, teaching and research. Students also receive preparation as nurse educators, and are therefore dually prepared for clinical and academic roles.

The program requires course content in theory, research, education, Adult Gerontology CNS professional and clinical cores, and the advanced practice area with a selected secondary focus. Applicants are admitted for either full-time or part-time study and can begin in fall. The curriculum is designed to prepare nurses as Adult Gerontology Clinical Nurse Specialists with a secondary clinical focus in an area of their choice. Graduates of this program are eligible to sit for the American Nurses' Association (ANCC) Adult Gerontology Clinical Nurse Specialist Certification Exam.

Adult Gerontology Clinical Nurse Specialist/Educator Full Time Curriculum

First Semester (Fall)

NURS 610	Theoretical Foundations for Nursing Practice	3
NURS 670	Advanced Pathophysiology	3
NURS 671	Advanced Physical Assessment	1

NURS 661	Pharmacotherapeutics for Primary Health Care Providers	3
Credit Hours		10
Second Semester (Spring)		
NURS 611	Research Design	3
NURS 638	Adult-Gerontology Clinical Nurse Specialist I: Introduction to Practice	2
NURS 639	Adult-Gerontology Clinical Nurse Specialist Practicum I: Role Socialization	3
NURS 615	Ethical Concepts and Issues in Advanced Practice Nursing	2
NURS 630	Nursing Curriculum Design and Program Evaluation	3
Credit Hours		13
Third Semester (Summer)		
NURS 656	Adult-Gerontology Clinical Nurse Specialist II: Transition to Practice	2
NURS 657	Adult-Gerontology Clinical Nurse Specialist Practicum II: Role Transition	3
NURS 676	Professional, Ethical and Legal Concepts of Nursing Education	3
NURS 621	Aging in the 21st Century	3
Credit Hours		11
Fourth Semester (Fall)		
NURS 732	Health Care Populations, Diversity and Outcomes	3
NURS 632	Instructional Delivery Methods and Learner Assessment	3
NURS 634	Nurse Educator/Faculty Internship I Classroom Instruction	2
NURS 703	Adult-Gerontology Clinical Nurse Specialist Practicum III: Role Synthesis	3
NURS 690	M.S.N. Comprehensive Examination	0
Credit Hours		11
Total Credit Hours		45

Master of Science in Nursing - Nurse Midwifery (cooperative program with Shenandoah University)

Kathleen Putnam, ODU Graduate Program Director

Julianna Fehr, Shenandoah University Coordinator

Due to the limited availability of clinical placements for Certified Nurse Midwifery students, Shenandoah University has decided not to accept any new students to this program until 2016. Contact the ODU Graduate Program Director for this track for additional information.

The Master's in Nursing, with specialization in nurse midwifery, is a joint program with Shenandoah University. The two-year program includes advanced practice nursing content offered by Old Dominion University in the Hampton Roads region at eight distance sites in Virginia during the first year. The second year in the midwifery program is at Shenandoah University. The Master of Science in Nursing is awarded by Old Dominion University and a certificate of midwifery specialty is awarded by Shenandoah University. Graduates are eligible to take the national midwifery certification examination. The program may be completed as a full-time or part-time program.

Nurse Midwifery Full Time Curriculum

First Semester (Fall) (ODU)		
NURS 610	Theoretical Foundations for Nursing Practice	3
NURS 661	Pharmacotherapeutics for Primary Health Care Providers	3

NURS 670	Advanced Pathophysiology	3
NURS 671	Advanced Physical Assessment	1
NURS 672	Advanced Physical Assessment Laboratory	1
NURS 719	Family and Community Primary Care Assessment	1
Second Semester (Spring) (ODU)		
NURS 611	Research Design	3
NURS 663	Health Promotion and Maintenance	2
NURS 664	Primary Care for Women	3
NURS 658	Advanced Nursing Practice in Women's Health I	2
Third Semester (Summer) (ODU)		
NURS 613	Issues in Advanced Nursing Practice	3
NURS 621	Aging in the 21st Century	3
Fourth Semester (Fall) (SU)		
NURS 695	SU Nursing (Primary Care of Women)	
NURS 695	SU Nursing (Comprehensive Antepartal Care)	
Fifth Semester (Spring) (SU)		
NURS 695	SU Nursing (Midwifery Practicum)	
NURS 695	SU Nursing (Comprehensive Perinatal Care)	
Sixth Semester (Summer) (SU)		
NURS 695	SU Nursing (Integrated Midwifery Program)	
NURS 695	SU Nursing (Advanced Nurse-Midwifery Role Development)	
Total Hours		47

BS-MSN-DNP: Nurse Executive

Carolyn Rutledge, Graduate Program Director

The BS-MSN-DNP program prepares students with the knowledge and skills to move into leadership positions within hospitals and healthcare organizations. The program focuses on the American Organization of Nurse Executive (AONE) guidelines for executive practice as well as the AACN DNP Essentials. The course content focuses on leadership skills, fiscal and human resource management, working with vulnerable populations, magnet achievement, organizational research, and emerging technologies. Students participate in practicum experiences throughout the program. Students are eligible to take the national AONE certifying exam upon completion.

BS-MSN-DNP Full Time Curriculum

First Semester (Spring)		
NURS 780	Financial Issues in Nursing Administration	3
NURS 740	Strategic Leadership	3
NURS 717	Strategic Leadership Practicum	3
Second Semester (Summer)		
NURS 735	Organizational and Management Theory	3
NURS 716	Organizational Leadership Practicum	3
NURS 709	Evidence-Based Research and Theories for Nursing Practice	3
Third Semester (Fall)		
NURS 718	Practicum Immersion for Novice Nurse Executives	3
NURS 615	Ethical Concepts and Issues in Advanced Practice Nursing	2
MPHO 612	Statistical Reasoning for Public Health	3
Fourth Semester (Spring)		
NURS 810	Leadership in Complex Systems and Organizations	3
NURS 800	DNP I: Introduction to Healthcare Disparities, Vulnerable Populations, and Epidemiology	2

NURS 805	Application of Practice-Based Research Methods	2
NURS 816	DNP Executive Practicum I	2-3
Fifth Semester (Summer)		
NURS 812	Evidence-Based Management for Quality Healthcare	3
NURS 806	Proposal Development and Database Management	4
NURS 817	DNP Executive Practicum II	3-5
Sixth Semester (Fall)		
NURS 807	Informatics and Healthcare Technology	3
NURS 814	Competitive Resource Design and Utilization	3
NURS 818	DNP Executive Practicum III	3-5
Seventh Semester (Spring)		
NURS 809	Advocacy for Healthcare Public Policy for Advanced Practice	3
NURS 890	DNP Nursing Capstone	3
NURS 819	DNP Executive Practicum IV	3-5
Total Hours		63-70

Post-Master's Certificate Programs

Certificate programs are designed to provide Master of Science in Nursing educated registered nurses with the knowledge and skills needed to register for an examination to certify as a family nurse practitioner or adult gerontology clinical nurse specialist. Individual programs of study are developed based upon the applicant's previous advanced practice education. A Nurse Educator certificate program is also available for individuals with a graduate degree in nursing who desire to develop their knowledge and skill for teaching in a nursing education program. A written comprehensive examination in the role specialty is required for all postmaster's students. A student must be registered in the semester the comprehensive exam is taken.

Nurse Educator Certificate

The Nurse Educator Certificate program is designed to offer nurses with at least one graduate degree in nursing the opportunity to earn academic credit while gaining valuable knowledge and practical experience related to teaching in entry-level or graduate nursing education programs.

Nurse Educator Certificate Full Time Curriculum

NURS 632	Instructional Delivery Methods and Learner Assessment	3
NURS 630	Nursing Curriculum Design and Program Evaluation	3
NURS 634	Nurse Educator/Faculty Internship I Classroom Instruction	2
NURS 676	Professional, Ethical and Legal Concepts of Nursing Education	3
Total Hours		11

Nurse Executive Certificate/Health Science Executive Certificate

Carolyn Rutledge, Graduate Program Director

This program is designed for students to develop competency in serving in a nurse executive or MBA role with a health science focus within healthcare organizations, hospitals and ambulatory care settings. The core courses in this program cover the basic knowledge of Informatics, Leadership, Evidence-Based Management, and Competitive Resources Design and Utilization.

Nurse Executive/Health Science Executive Certificate Full Time Curriculum

NURS 710/810	Leadership in Complex Systems and Organizations	3
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NURS 712/812	Evidence based Management for Quality Healthcare	3
NURS 707/807	Informatics and Healthcare Technology	3
NURS 714/814	Competitive Resource Design and Utilization	3
Total Hours		12

Doctor of Nursing Practice (DNP) - Advanced Practice (Post Master's)

Carolyn Rutledge, Graduate Program Director

The Doctor of Nursing Practice (DNP) degree will provide additional education for advanced practice nurses in:

1. Advanced diagnostics and practice skills;
2. Care of the underserved and increasingly diverse population; and
3. Incorporation of emerging care technologies. The program may be completed as a full-time or part-time student and is distance friendly.

In order to graduate from Old Dominion University's DNP Program, a student must have successfully completed all 36 post-masters credit hours of required course work, including an evidence-based capstone project and all clinical practica. It will take a full-time student four semesters (spring, summer, fall and spring) to complete the program. A part-time student will complete the DNP program in seven semesters (spring, summer, fall, spring, summer, fall, and spring.)

DNP Advanced Practice Full Time Curriculum

First Semester (Spring)

NURS 800	DNP I: Introduction to Healthcare Disparities, Vulnerable Populations, and Epidemiology	2
NURS 802	The Business of Advanced Nursing Practice	3
NURS 805	Application of Practice-Based Research Methods	2
NURS 865	DNP Clinical Practicum I	2

Second Semester (Summer)

NURS 801	DNP II: Roles and Responsibilities for Transforming Practice	3
NURS 806	Proposal Development and Database Management	4
NURS 866	DNP Clinical Practicum II	2

Third Semester (Fall)

NURS 803	Leadership and Interprofessional Practice in Healthcare	3
NURS 807	Informatics and Healthcare Technology	3
NURS 867	DNP Clinical Practicum III	3

Fourth Semester (Spring)

NURS 809	Advocacy for Healthcare Public Policy for Advanced Practice	3
NURS 868	DNP Clinical Practicum IV	3
NURS 890	DNP Nursing Capstone (DNP Capstone)	3

Total Hours		36
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Doctor of Nursing Practice (DNP) – Nurse Executive (Post-Master's)

Carolyn Rutledge, Graduate Program Director

The Nurse Executive role prepares top level nurse executives for leadership positions in a health system. The program outcomes are consistent with the American Organization of Nurse Executive guidelines for nurse executive practice. Content focuses on executive leadership skills, working with vulnerable populations, fiscal and human resource management, quality magnet achievement, emerging technology, and organizational research in clinical issues. Students participate in executive internships throughout

the program in their home area. Upon program completion, graduates are eligible to take the national certification examination.

DNP Nurse Executive Full Time Curriculum

First Semester (Spring)		
NURS 800	DNP I: Introduction to Healthcare Disparities, Vulnerable Populations, and Epidemiology	2
NURS 805	Application of Practice-Based Research Methods	2
NURS 810	Leadership in Complex Systems and Organizations	3
NURS 816	DNP Executive Practicum I	2-3
Second Semester (Summer)		
NURS 806	Proposal Development and Database Management	4
NURS 812	Evidence-Based Management for Quality Healthcare	3
NURS 817	DNP Executive Practicum II	3-5
Third Semester (Fall)		
NURS 807	Informatics and Healthcare Technology	3
NURS 814	Competitive Resource Design and Utilization	3
NURS 818	DNP Executive Practicum III	3-5
Fourth Semester (Spring)		
NURS 809	Advocacy for Healthcare Public Policy for Advanced Practice	3
NURS 819	DNP Executive Practicum IV	3-5
NURS 890	DNP Nursing Capstone (DNP Capstone)	3
Total Hours		37-44

School of Physical Therapy and Athletic Training

3118 Health Sciences Building
757- 683-4519
www.hs.odu.edu/physther/

Martha Walker, Chair
George Maihafer, Graduate Program Director

Doctor of Physical Therapy Degree

The Doctor of Physical Therapy (<http://hs.odu.edu/physther>) program is designed to professionally prepare students with the knowledge and clinical experiences to become licensed physical therapists who will enter general physical therapy practice. Upon graduation, students will be prepared to sit for licensure in any United States jurisdiction and practice in any health care setting where physical therapy is offered. The curriculum consists of 117 credit hours over a three-year period of time including summers. There are five full-time clinical internships totaling 40 weeks. The first three are completed over the second and third summers, with the final 16 weeks of clinical education occurring in the spring semester preceding graduation. A variety of clinical facilities locally, throughout Virginia, and the United States are used for internship experiences. Students are responsible for providing their own transportation to these off-campus clinical sites.

Requirements for Admission

Students are admitted to the program after completion of a bachelor's degree and prerequisite course work. The application deadline is November 1 of each year, and the program begins the last week in June. Specific procedures for admission must be followed including the verification of meeting the technical standards. Admission into the program is competitive.

An application to the University and a separate application to the Physical Therapy Centralized Application Service (PTCAS) must be submitted. The PTCAS website will be open to applicants August 1 each year at www.PTCAS.org (<http://www.PTCAS.org>). Deadline for application

submission is November 1 each year. Please follow the directions for application found at the PTCAS site.

A competitive admission process is used for determining acceptance. Excellent ODU students may qualify for guaranteed entry into the Doctor of Physical Therapy program. For criteria and additional information, please contact the Pre-Health Undergraduate Advisor from Exercise Science (757) 683-4995 or College of Health Sciences advisor at (757) 683-5137.

Degree Requirements

Prerequisite courses include the following:

STAT 130M	Elementary Statistics	3
BIOL 121N	General Biology I	3
BIOL 122N	General Biology I Lab	1
BIOL 123N	General Biology II	3
BIOL 124N	General Biology II Lab	1
BIOL 250	Human Anatomy and Physiology I	4
BIOL 251	Human Anatomy and Physiology II	4
Two semesters of Chemistry, including labs		8
Two semesters of Physics, including labs		8
Psychology		3
An introductory course in Biomechanics or Kinesiology recommended but not required		
Total Hours		38

Students are required to pass written and oral comprehensive examinations prior to graduation. Comprehensive examinations take place in the final academic semester prior to the terminal two clinical internships.

Curriculum Schedule

Year 1		
Summer		
PT 621	Introduction to Physical Therapy	2
BIOL 889	Gross Anatomy	6
Fall		
PT 627	Theory and Practice I	4
PT 630	Concepts in Histology for Physical Therapy	1
PT 634	Clinical Sciences I	3
PT 640	Patient Evaluation I	3
PT 655	Clinical Problem Solving I	2
PT 665	Biomechanics/Kinesiology I	3
PT 792	Neuroscience I	3
Spring		
PT 628	Theory and Practice II	4
PT 635	Clinical Sciences II	3
PT 641	Patient Evaluation II	3
PT 656	Clinical Problem Solving II	2
PT 666	Biomechanics/Kinesiology II	2
PT 638	Exercise Physiology	2
PT 793	Neuroscience II	3
Year 2		
Summer		
PT 669	Clinical Internship I	4
Fall		
PT 810	Scientific Inquiry I	3
PT 826	Theory and Practice III	4
PT 836	Clinical Sciences III	3
PT 842	Patient Evaluation III	3
PT 857	Clinical Problem Solving III	2
PT 884	Clinical Teaching and Professional Communication	3
Spring		

PT 822	Scientific Inquiry II	2
PT 827	Theory and Practice IV	4
PT 837	Clinical Sciences IV	3
PT 858	Clinical Problem Solving IV	2
PT 865	Prosthetics and Orthotics	3
PT 881	Management of Special Populations	2
PT 895	Topics in Physical Therapy I	1
Year Three		
Summer		
PT 871	Clinical Internship II	4
PT 872	Clinical Internship III	4
Fall		
PT 892	Scientific Inquiry Seminar	2
PT 880	Psychosocial Aspects of Patient Care	2
PT 882	Practice Management	3
PT 890	Differential Diagnosis Seminar	3
PT 883	Professional Issues in Physical Therapy	2
PT 891	Seminar in Integrative Case Reports	3
PT 896	Topics in Physical Therapy II	1
Spring		
PT 873	Clinical Internship IV	4
PT 874	Clinical Internship V	4
Total Hours		117

Athletic Training - Master of Science in Athletic Training

Bonnie Van Lunen, Graduate Program Director of Athletic Training
School of Physical Therapy and Athletic Training
3118B Health Sciences Building
757-683-3516

This degree is designed to prepare athletic trainers for advanced study in the areas of research, clinical application, and education. The associated course work will involve exploration of lower extremity injury management strategies, advanced clinical practice techniques, and preparation of the entry level educator.

Admission and Entrance Requirements

Students must have:

1. a bachelor's degree from an accredited institution with a cumulative undergraduate GPA of 3.0 and a GPA of 3.0 in the undergraduate major courses;
2. the Board of Certification credential for certification as an Athletic Trainer, OR eligibility to take the Board of Certification examination; and
3. a score of at least 291 (900 by former scoring standard) between quantitative and verbal on the Graduate Record Examination (GRE) for admission to regular status.

Acceptance into the graduate school does not imply automatic acceptance into the athletic training program. All applicants must complete the application materials for the Office of Graduate Admissions, and the Athletic Training Selection Committee will then invite qualified candidates for an on campus interview. If the applicant is unable to interview on campus, then a phone interview will be scheduled. The application deadline is **January 1**, however applications will be reviewed as soon as they are complete. Applications will also be accepted after the deadline until all positions are filled.

Continuance and Exit Requirements

Students must meet all requirements for continuance as outlined in the graduate continuance policy for the University. Students completing the program of study must:

1. have an overall grade point average of 3.0;
2. have a GPA of 3.0 in the major;
3. demonstrate writing proficiency;
4. satisfy all course competencies;
5. pass a comprehensive examination;
6. complete a research project or thesis;
7. have an exit interview with the program director; and
8. file the necessary paperwork for graduation.

Curriculum

Core courses

AT 628	The Spine: Evaluation and Rehabilitation	3
AT 756	Education in Athletic Training	4
AT 657	Lower Extremity Injury Management Strategies	3
AT 691	Gross Anatomy for Sports Medicine Clinicians	4
AT 626	Advanced Orthopaedic Evaluation and Rehabilitation	3

Research Core

AT 650	Integration of Evidence for Clinical Decision Making in Sports Medicine	6
AT 651	Statistical Techniques for Clinical Decision Making in Sports Medicine	

Requirements for different tracks are as follows:

		18
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Thesis Track

Includes 6 credit hours for Thesis and 12 credit hours for electives.

HMS 698 Thesis

HMS 699 Thesis

Electives (12 credit hours)

Research-Problem Track

AT 670 Athletic Training Research I

AT 671 Athletic Training Research II

AT 672 Athletic Training Research III

Electives (12 credit hours)

Total Hours		41
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Center for Brain Research and Rehabilitation

The School of Physical Therapy and Athletic Training has opened a 3,800 square foot research facility (<http://hs.odu.edu/physther/resources/lab.shtml>) with a large gait/movement assessment area, a room for virtual reality and rehabilitation studies, a multipurpose room for neurologic testing, and office space for faculty and graduate students. A primary research focus relates to neuromechanical basis of human movement under healthy and pathological conditions, with more clinically oriented studies on methods to improve gait and function in people with neurologic impairments. Lab Director Dr. Steven Morrison is a leading researcher in identifying risks for falling and testing interventions to prevent falls. This research laboratory is designed for multidisciplinary use by faculty and graduate students in Physical Therapy, Human Movement Sciences, and Electrical and Computer Engineering. Collaboration among disciplines and with the Virginia Modeling and Simulation Center (VMASC) allows us to participate in exciting research projects exploring new technology in rehabilitation.

ODU Monarch Physical Therapy

The School of Physical Therapy and Athletic Training, with support from the College of Health Sciences and Old Dominion University, operates a physical therapy clinic on the ODU campus. It is located at 1015 West 47th Street. To contact them, call (757) 683-7041. The clinic provides service to ODU faculty, staff and students as well as the neighboring community. It also serves as a site for students to learn to apply assessment,

decision-making, and treatment skills. In addition, clinical research studies coordinated with the Center for Brain Research and Rehabilitation are conducted at the clinic.

College of Sciences

www.sci.odu.edu/

143 Oceanography & Physics Building
Norfolk, VA 23529
757-683-3274

Chris Platsoucas, Dean
Ravi Mukkamala, Associate Dean
Terri M. Mathews, Associate Dean

Ph.D.

- Applied Experimental Psychology
- Biomedical Sciences
- Chemistry
- Clinical Psychology
- Computational and Applied Mathematics
- Computer Science
- Ecological Sciences
- Human Factors Psychology
- Industrial/Organizational Psychology
- Oceanography
- Physics

Master's

- Biology
- Chemistry
- Computational and Applied Mathematics
- Computer Science
- Ocean and Earth Science
- Physics
- Psychology

Overview

The College of Sciences' degree programs are designed to prepare students for careers in the sciences and to lay broad foundations for specialized training in these fields of knowledge.

The college is comprised of the Departments of Biological Sciences, Chemistry and Biochemistry, Computer Science, Mathematics and Statistics, Ocean, Earth and Atmospheric Sciences, Physics, and Psychology. The Departments of Biological Sciences, Chemistry and Biochemistry, Mathematics and Statistics, Ocean, Earth and Atmospheric Sciences, and Physics cooperate with the Darden College of Education to provide the necessary courses for a Masters of Science in Education in the respective field.

Programs

The College of Sciences has developed graduate programs in the basic and applied sciences that meet the needs of the Eastern Virginia region, the state, the nation and the world. These programs address a variety of challenges, ranging from basic research to the quest for solutions to contemporary problems in science. The importance of these challenges is reflected by the more than \$18 million in research and training grants currently generated by the college. The college provides the nation with much-needed graduate programs in broad fields of concentration leading to both master's and doctoral degrees. Related program emphases within the major areas of study are designed to meet the professional needs of the students and communities served.

The college's faculty of 190 highly skilled professional educators is devoted to guiding students toward an assimilation of the most current scientific theories, research, and practices.

College Financial Aid

The College of Sciences has established teaching and research assistantship stipends that range from \$6,400 to \$20,500. The responsibility for distributing these assistantship stipends lies in each department. In addition, each department has fellowship and tuition exemption funds available for competitive distribution.

Dominion Graduate Scholars

Programs in the College of Sciences offer a number of very competitive awards for graduate students newly admitted into Ph.D. programs. Some of these are Dominion Graduate Scholar appointments that carry a stipend of \$18,000 for a 12-month period and full tuition exemptions. These Scholars must be enrolled in at least nine hours of graduate courses each semester, and three graduate credits during the summer to meet institutional eligibility requirements. These students are expected to be scholars in residence and spend full time in pursuit of their studies. Since the teaching or research experience will be more limited than for other awards, the Scholars will have sufficient time to devote to their academic studies.

All admission materials are considered as a part of the evaluation process. Students apply to specific graduate programs and may inquire about the Dominion Graduate Scholarship. After a student has been appointed to a Dominion Scholarship, the Graduate program director will submit a copy of their letter-of-offer, letter-of-acceptance and the awardee's credential summary.

Minimum criteria for eligibility are as follows:

1. GRE scores: 310 combined verbal and quantitative, and at least a 4.0 on the analytical writing section.
2. GRE scores (older version): 1200 combined verbal and quantitative, or 1300 in any two of verbal, quantitative, or analytical.
3. Undergraduate GPA of 3.20 overall and 3.50 in the major, out of 4.00 maximum.
4. Evidence of research aptitude by undergraduate thesis/research, publications, M.S. thesis and/or letters of reference.
5. Information concerning the Dominion Graduate Scholar Program may be obtained from the graduate program director for the program of interest.
6. Written acknowledgment from a faculty member agreeing to serve as the student's major advisor, if the student is accepted.

Doctor of Philosophy - Biomedical Sciences

Robert E. Ratzlaff, Graduate Program Director

In this interdisciplinary program all students are required to master a broad knowledge of the basic biomedical sciences. Integration of the basic courses is reinforced by a rotation of laboratory experiences and by special seminars that highlight disciplinary interrelationships and approaches to biomedical research. The student progresses from a core of basic courses to in-depth study of specific biomedical problems. This includes advanced doctoral courses and the doctoral research project. Under the guidance of the graduate faculty, the student will integrate knowledge from the broad spectrum of biomedical disciplines into his or her focus on an area of specialization.

The program graduate will be a scientist with a broad biomedical education and a demonstrated ability to carry out original and creative research, cognizant of the disciplinary interfaces and implications and capable of pursuing and/or recommending continuing lines of study. He/she will be prepared to bridge the gap between practice and discovery in the art of medicine and the practice of science. The graduate is capable of serving in an industrial, governmental, or academic teaching or research setting, either independently or as a member of a team.

Admission

The requirements for admission to the biomedical sciences Ph.D. program are as follows:

1. A bachelor's degree from an accredited college or university with a B (3.00) average. Students with advanced degrees are encouraged to apply.

- GRE scores: 300 combined verbal and quantitative, and at least a 3.5 on the analytical writing section.
- GRE scores (older version): 1000 combined verbal and quantitative.
- Prior training in biology (two years), calculus and/or statistics, and organic chemistry (one year). Additional courses in biology, chemistry, and physics are recommended.

Curriculum and Requirements

To accomplish the objectives of the program, the student:

- Enrolls in the basic biomedical sciences courses to develop a broad foundation for more advanced course work and dissertation research;
- Selects appropriate advanced course work approved by the guidance committee;
- Completes at least 79 credit hours beyond the bachelor's degree or 48 credit hours beyond the master's degree;
- Presents two seminars;
- Passes either
 - written and oral qualifying examinations on course work or
 - an NIH-style grant proposal written on a research question in an area not specific to the planned research in the mentor's laboratory and an oral exam on the grant proposal and on coursework;
- Develops an interdisciplinary research proposal in NSF or NIH format that is accepted by the guidance committee;
- Performs publishable research to demonstrate the ability to complete original and creative research projects; and
- Prepares and successfully defends a dissertation.

Application Procedures

The completed application for the biomedical sciences Ph.D. program will include the following items:

Transcripts of all college course work. Transcripts will be official transcripts sent by the registrars of the colleges attended.

- Graduate Record Examination (GRE) test scores, sent directly from the Educational Testing Service to the Old Dominion University Graduate Admissions Office. The Medical College Admissions Test (MCAT) can substitute for the GRE (minimum score 26).
- A statement of personal goals and academic objectives.
- Three letters of recommendation, preferably from faculty members at colleges attended who are familiar with the applicant's academic and research capabilities.
- A completed application form.
- Receipt of the application fee. Checks should be made payable to Old Dominion University.
- Test of English as a Foreign Language (TOEFL) test scores, sent directly from the ETS to ODU International Graduate Admission Office must accompany international applications for applicants with a degree issued outside of the United States.

Applications to Old Dominion University can be completed on-line <http://www.odu.edu/admission/graduate>.

The applicant is responsible to ensure that all application materials are received and the application is complete in all respects.

Financial Aid

Sources of financial aid available to biomedical sciences Ph.D. students include

- waivers of tuition,
- research and teaching assistantships and
- loans.

Department of Biological Sciences

110 Mills Godwin Building
Norfolk, Virginia 23529-0266

(757) 683-3595
<http://sci.odu.edu/biology/>

Wayne L. Hynes, Chair
Ian K. Bartol, Ecological Sciences Ph.D. Graduate Program Director
Robert E. Ratzlaff, Biology Master's Graduate Program Director
Robert E. Ratzlaff, Biomedical Sciences Ph.D. Graduate Program Director

The Department of Biological Sciences provides a broad selection of course offerings. The degree program in biology allows for the selection of elective subjects most suited to the individual's vocational interests.

Master of Science—Biology

Robert E. Ratzlaff, Graduate Program Director

The Department of Biological Sciences provides a broad selection of course offerings. The degree program in biology allows for the selection of elective subjects most suited to the individual's vocational interests.

The curriculum for the Master of Science program is developed around one's interests such as:

- botany,
- ecology,
- immunology,
- infectious diseases,
- marine biology,
- microbiology,
- physiology,
- reproductive biology,
- systematic biology, and
- zoology.

In addition, there are two specially designed concentration areas in:

- biotechnology and
- wetland ecology.

Facilities in the Department of Biological Sciences include:

- electron microscopy,
- terrestrial and aquatic animal care facilities,
- biomechanics,
- environmental pollution,
- marine benthic ecology,
- biotechnology,
- spectroscopy,
- cell culture,
- protein separation,
- DNA sequencing,
- GIS (Geographic Information System),
- digital imaging,
- a greenhouse,
- herbarium,
- zoological museum,
- animal facilities, and
- field science wet laboratories.

In addition, excellent opportunities exist for research and instruction off-campus at field research sites including:

- Blackwater Ecological Preserve,
- Virginia Coast Reserve-Long Term Ecological Research Site,
- Virginia Institute of Marine Sciences Eastern Shore Marine Laboratory, and
- other regional agencies and facilities.

Admission Information

Students who wish to enter this program should apply to the Master of Science in biology program and indicate their proposed field of study in the Statement of Interest, a required component of the application. Applications for admission can be obtained via the Internet at <http://www.odu.edu/admission/graduate> or from:

Office of Graduate Admissions
Old Dominion University
Norfolk, VA 23529-0050
(757) 683-3685

Requirements for regular admission to the master's program in biology are:

1. a bachelor's degree in biology or a related field from an accredited college or university;
2. a grade point average of at least 3.00 on a 4.00 scale;
3. Satisfactory scores on the General portion of the Graduate Record Examination (Verbal+Quantitative 1000 or 300 on the new GRE) or at least a 24 on the Medical College Admission Test
4. two letters of recommendation;
5. an essay describing the area of biology of interest for graduate study, professional goals and motivation for graduate study in biology; and
6. written acknowledgment from a Department of Biological Sciences faculty member agreeing to serve as the student's major advisor, if the student is accepted.

The Test of English as a Foreign Language (TOEFL) is required of all applicants whose native language is not English: minimum scores are 550 for the paper-based test, 213 for the computer-based or 79 on internet-based test.

Deadlines for application to the program are:

- February 1 for summer admission, early fall admission and consideration for a graduate teaching assistantship;
- June 1 for fall semester admission; and
- October 1 for spring semester admission.

Degree Requirements

Two degree options are available — thesis and non-thesis. A minimum of 31 semester hours of graduate credit is required of thesis students and 37 of non-thesis students; three-fifths of these credits must be at the 600-level or above. Research (BIOL 698) is required of all students. All students must deliver a scientific presentation in an appropriate public forum. For thesis students, the presentation should be at a scientific meeting. Course work, including any required courses, is selected according to the interest of the student, with the guidance and approval of the student's faculty advisory committee. All students will complete a comprehensive exam (written or oral) that covers the student's program of study. A substantial research project and a defense of the written thesis (BIOL 699) are required of students selecting the thesis option.

Master of Science - Biology

Many pertinent graduate courses are offered for the Master of Science in Biology programs that can be applied toward the degree requirements. A program of study is developed by the student with approval of advisory committee and the Graduate Program Director.

Master of Science - Wetland Biology Concentration

The wetland biology concentration has been structured to contain essential clusters in the following disciplines: plant identification, wetland and aquatic ecology, soils and hydrology, regulation, technical application, topical seminars, internships, and research and/or thesis. Recommended course are:

BIOL 519	Wetland Plants	5
BIOL 550	Principles of Plant Ecology	4
OEAS 508	Introductory Soils	4
OEAS 622	Wetland Hydrology	3

Master of Science - Biotechnology Concentration

The biotechnology program is designed to enable the student to learn basic skills in cell and molecular biology, with the flexibility to develop a curriculum in the areas of infectious diseases, immunology, physiology, or environmental molecular biology.

Biotechnology students are required to take five core courses (below) in addition to the research and presentation requirements.

BIOL 523	Cellular and Molecular Biology	3
CHEM 541	Biochemistry Lecture	3
CHEM 543	Intermediate Biochemistry	3
BIOL 671	Molecular and Immunological Techniques	4
BIOL 755	Molecular Genetics	3

The remaining coursework is selected according to the interest of the student, with the guidance and approval of the student's faculty advisory committee.

Master of Science in Education - Biology

Refer to the Darden College of Education section of this catalog (p. 100).

Doctor of Philosophy - Biomedical Sciences

Robert E. Ratzlaff, Graduate Program Director

In this interdisciplinary program all students are required to master a broad knowledge of the basic biomedical sciences. Refer to the College of Sciences (<http://catalog.odu.edu/graduate/collegeofsciences>) section of this catalog for details.

Doctor of Philosophy - Ecological Sciences

Dr. Ian K. Bartol, Graduate Program Director

Program Description

The primary goal of the doctoral program in ecological sciences is to provide advanced training in ecological, evolutionary and integrative biology.

The program has notable strengths in a broad range of biological sub-disciplines, including:

- ecosystem studies,
- experimental ecology,
- community ecology,
- behavioral ecology,
- marine biology,
- molecular genetics,
- conservation biology,
- systematics,
- modeling,
- evolutionary biology,
- biomechanics,
- parasitology, and
- functional morphology.

Program faculty conduct studies in a variety of terrestrial, freshwater, and marine environments on several continents, and their research focuses on a broad spectrum of taxa, including, but not limited to:

- vascular plants,
- polychaetes,
- mollusks,
- crustaceans,
- insects,
- arachnids,
- birds,
- fishes, and

- amphibians.

Many faculty combine active field research with parallel laboratory studies. Quantitative approaches are encouraged and the opportunity exists to obtain a master's degree in statistics while pursuing a doctorate in ecological sciences. The program is enhanced by excellent on-campus resources that include a scanning electron microscopy lab, genetic sequencing facilities, herbarium, aquatics laboratory, water tunnel and flow quantification facility, GIS facilities, greenhouse, and digital imaging facilities. Field research sites have been established in:

- the Virginia Coastal Reserve,
- Blackwater Ecologic Preserve,
- Great Dismal Swamp,
- Atlantic Ocean,
- Chesapeake Bay, and
- other areas.

Admission

Application forms for admission to the Ph.D. program in ecological sciences are available from the Office of Admissions and online (<http://www.odu.edu/admission/graduate>). The following should be sent to the Admissions Office:

1. the completed application form;
2. official transcripts from all universities attended;
3. Graduate Record Examination (GRE) scores;
4. test of English as a Foreign Language (TOEFL) score (from students whose native language is not English);
5. three letters of recommendation, including one from the applicant's major advisor; and,
6. a statement of professional goals that includes specific research interests.

If an applicant is interested in requesting financial aid, an application for institutional graduate financial assistance should be completed during the application process (see Office of Admissions web page for form). The deadline for application to the program is February 1 for the subsequent fall semester. Students may be admitted during the spring and summer semesters as well, provided they obtain permission from the Graduate Program Director.

To qualify for admission, a student needs:

1. a satisfactory academic average (overall GPA score of at least 3.0 on a 4.0 scale, and overall GPA in the sciences of at least 3.0);
2. GRE scores near the 70th percentile on each of the examination sections (verbal, quantitative, and analytical) with a combined total of at least 1,000 to 1,200 preferred on the verbal and quantitative sections;
3. a TOEFL score of at least 550 (paper-based test), 213 (computer-based test), or 79 (internet-based test) for applicants whose native language is not English;
4. satisfactory letters of recommendation; and
5. a statement of professional goals as stated above.

A master's degree is desirable but not required. The applicant is expected to have a background in the sciences, with an appropriate undergraduate degree and substantial course work in biology, chemistry or geology.

Applicants are strongly advised to contact the ODU faculty member closest to their area of interest prior to submitting an application to determine whether that faculty member is accepting new graduate students. No student, regardless of qualifications, is admitted to the Ecological Sciences Program without the approval of a specific faculty advisor. Potential applicants therefore should initiate a dialogue, preferably by email, with an appropriate member of the program faculty. Applicants should consult the list of faculty in the Department of Biological Sciences, which includes a brief description of their research interests. Applicants may also find it desirable to visit the campus for an interview with a potential advisor and the Graduate Program Director.

It is important for potential applicants to realize that many considerations enter into the decision to accept a student into the program. In addition to the strength of an applicant's credentials (GRE scores, transcripts, and letters of recommendation), the availability of space in the appropriate faculty advisor's lab and availability of adequate financial aid may influence the decision. Of these, space in an appropriate advisor's lab is the most important consideration after an applicant's academic qualifications. For this reason, applicants are strongly encouraged to contact a potential advisor directly.

Program Requirements

Program requirements are designed to provide a firm foundation in conceptual elements of ecological, evolutionary, and integrative biology, while moving students expeditiously toward their own research. In general, students must complete:

- 48 hours beyond the master's degree, or
- in the absence of a master's, 70 hours beyond the bachelor's degree.

The student's program of study should be broad and balanced. Coursework varies with each student, depending on background and goals. Enrollment in a weekly ecology seminar is required, on average, one semester each year. Professional experience (environmental management or teaching) is encouraged. A five-member advisory committee of faculty is selected to guide the student through his or her course of study and to provide initial approval of the dissertation research. This committee also administers the comprehensive written and oral candidacy examinations, which are taken after all required coursework is completed and the research skill requirement (proficiency on one foreign language or computer programming) is satisfied. The written exam must be passed before the oral exam may be taken. Once the candidacy exams are completed and a dissertation committee approves a written dissertation prospectus, the student advances to candidacy. At least three of the members of the original advisory committee, including the committee chair (student's major advisor), will compose the dissertation committee. This committee approves a written dissertation prospectus and will supervise the research. At this time, the student's attention turns almost exclusively to his or her own research. However, students continue to participate in seminar courses on a variety of topics, and an average of one seminar course per year of residency on campus is required. At the conclusion of their research, the student submits a dissertation to the committee and presents a public defense of this work.

Department of Chemistry and Biochemistry

110 Alfriend Chemistry Building
Norfolk, VA 23529-0126
(757) 683-4078

Patricia Pleban, Interim Chair (through June 24, 2014)
After June 24, 2014
TBA, Chair

Craig A. Bayse, Graduate Program Director (through August 31, 2014)
After August 31, 2014
TBA., Graduate Program Director

Master of Science – Chemistry

The Department of Chemistry and Biochemistry offers a program of study leading to the degree of Master of Science in Chemistry. This program offers a sound academic background of coursework and research to prepare the student for further graduate study or employment in fields requiring an advanced degree. Areas of specialization within the program include: analytical chemistry, biochemistry, environmental chemistry, inorganic chemistry, materials chemistry, organic chemistry, and physical chemistry.

Admission

An application (www.admissions.odu.edu), transcripts, two letters of recommendation from former college instructors, a resume, a writing sample, an essay about career goals, and Graduate Record Examination

(GRE) scores (general only) are required for consideration of admission to the program. Admission to regular status requires a grade point average of 3.00 in the major and 2.80 overall (on a 4.00 scale). General university admission requirements also apply. In addition, a Bachelor of Science degree (or equivalent) with a major in chemistry (or another science) is required, although applications from majors in all science disciplines are encouraged. Undergraduate courses in organic chemistry, inorganic chemistry, analytical chemistry (quantitative and instrumental analysis), physical chemistry, and calculus are required for regular admission. Deficiencies in any of these areas will be identified and must be rectified by taking undergraduate coursework.

Program Requirements

Writing Proficiency Policy

The departmental graduate committee will request a writing sample from each new student. The graduate committee will refer students in need of remedial assistance to the Writing Center.

Options

Candidates for the master's degree have two options in their program: the Research/Thesis option and the Non-Thesis option.

Courses

Thesis option, 30 hours minimum, including:	24
Research and Thesis	6
<hr/>	<hr/>
Total Hours	30
Non-thesis option, 33 hours minimum, including:	30
Independent study	3
<hr/>	<hr/>
Total Hours	33

Up to 15 hours may be taken in related courses given by other departments pending approval from the Graduate Studies Committee of the Department of Chemistry and Biochemistry. At least 60 percent of the credit hours must be from 600-level courses or higher.

Students who earn grades of C+ or lower in any two graduate courses will not be allowed to continue in the M.S. program.

Core Courses

There are six core areas. These are:

- analytical chemistry,
- biochemistry,
- environmental chemistry,
- inorganic chemistry,
- organic chemistry, and
- physical chemistry.

Students enrolled in the research/thesis option must take one course from three different core areas; non-thesis option students must take one course from five of the core areas.

Seminar

All students are required to register for seminar (CHEM 690, one credit, pass/fail) and attend departmental seminars for one semester.

Research and Thesis

During their first semester (and not later than the end of their first academic year), students electing the Research/Thesis Option are required to interview the chemistry graduate faculty, choose a graduate faculty research advisor, and select a research committee in consultation with their advisor and the Graduate Program Director. Upon completion of their research, students must write a formal thesis describing their research, present their work in a public seminar, and pass an oral examination by their research committee.

Non-Thesis Option

Not later than the end of their first academic year, students electing the Non-Thesis Option are required to interview the chemistry graduate faculty

and choose an independent study advisor. Non-thesis students and their independent study advisor will then agree upon an independent study project. Upon completion of their independent study project, non-thesis students must write a formal Independent Study Report acceptable to their independent study advisor and the Graduate Studies Committee and pass an oral exam on their project.

Master of Science in Education - Chemistry Major

Refer to the Darden College of Education section of this catalog (p. 100).

Doctor of Philosophy – Chemistry

The Ph.D. program in Chemistry prepares students in the application of chemical principles to address many of society's technical, environmental, and biomedical problems. Students will be able to provide leadership in industrial, governmental, and educational institutions in directing research and/or development to solve these problems. The Ph.D. degree in Chemistry is granted to students who have:

1. mastered advanced knowledge of definite sub-fields of chemistry
2. become familiar with research in these specific fields and developed perceptions of opportunities for further scientific advances
3. demonstrated the capacity to perform original, independent, and scholarly scientific investigation in their specific field and interpret their results.

All students admitted to the program must read and understand the regulations and policies described here and elsewhere throughout this catalog relevant to Old Dominion University's requirements for Ph.D. degrees. The essential credit requirements for the Chemistry Ph.D. are:

A minimum of 78 credit hours beyond the Bachelor's degree, and 48 credit hours beyond the Master's degree.

Admission

An application (www.admissions.odu.edu), transcripts, three letters of recommendation from former college instructors, an essay about career goals and Graduate Record Examination (GRE) scores (aptitude section) are required for consideration of admission to the program. Admission to regular status requires a grade point average of 3.00 in the major and 3.00 overall (based on a 4.00 scale). General university admission requirements apply. In addition, a bachelor's degree (or equivalent) with a major in chemistry (or another science) is required, although applications from majors in all science disciplines are encouraged. Undergraduate courses in inorganic chemistry, organic chemistry, analytical chemistry (quantitative and instrumental analysis), physical chemistry, and calculus are required for regular admission. Deficiencies in any of these areas will be identified and must be rectified by taking undergraduate coursework in these areas.

Program Requirements

Writing Proficiency Policy

The departmental graduate committee will request a writing sample from each new student. If the graduate committee feels that remedial assistance in writing is needed, the student will be referred to the Writing Center.

Courses

A minimum of 78 semester hours beyond the undergraduate degree or 48 hours past the master's degree is required by this program. The broad requirements for granting the Ph.D. are as follows:

- satisfactory performance in core and elective courses,
- successful completion of both written and oral portions of the Candidacy Examination,
- completion of the dissertation prospectus,
- and completion of a satisfactory dissertation and defense of the dissertation.

Students who earn grades of C+ or lower in any two graduate courses will not be allowed to continue in the Ph.D. program.

Core Courses

Students must choose one course from three different core areas. The core areas are:

- analytical chemistry,
- biochemistry,
- environmental chemistry,
- inorganic chemistry,
- organic chemistry, and
- physical chemistry.

Classes from each area are listed on the following pages.

Elective Courses

Students are required to take nine credit hours of elective courses. The courses are to be chosen upon consultation with their advisor and/or their guidance committee.

Teaching

Students are required to spend at least one semester as a teaching assistant.

Seminar

All students are required to register for seminar CHEM 890 (one credit, graded pass/fail) and attend departmental seminars throughout their graduate career. Twice during their career, students will register for CHEM 891 (two credits) and present a seminar, which will receive a letter grade. In the second year, students will give a background literature talk on their research. The second semester of CHEM 891 may not be taken in the same semester as graduation.

Advisor Selection

During their first semester (and not later than the end of their first semester), students are required to interview the chemistry graduate faculty (a signed sheet of at least three faculty members is required), choose a graduate faculty research advisor, and select a guidance committee in consultation with their advisor and the Graduate Program Director.

Candidacy Examination

A student admitted to the Ph.D. program in chemistry becomes a candidate for the Ph.D. degree by passing the Ph.D. Candidacy Examination. This examination consists of a written portion and oral portion. The student is required to submit a written description of a novel research idea in the form of a grant proposal, and then present and defend the idea to his or her guidance committee.

Dissertation

The dissertation is the final and most important part of the work required for the Doctor of Philosophy degree in chemistry. The dissertation must be based on original research and make a contribution to existing knowledge of sufficient interest to warrant publication in a refereed journal. The candidate normally works closely with the research advisor, who is chair of the dissertation committee.

Dissertation Defense

The final examination of the candidate consists of the oral defense of the dissertation. This public examination is conducted by the dissertation committee with the research advisor serving as chair.

Doctor of Philosophy - Biomedical Sciences

Robert E. Ratzlaff, Graduate Program Director

In this interdisciplinary program all students are required to master a broad knowledge of the basic biomedical sciences. Refer to the College of Sciences (<http://catalog.odu.edu/graduate/collegeofsciences>) section of this catalog for details.

Department of Computer Science

Engineering & Computational Sciences Bldg.
4700 Elkhorn Ave, Suite 3300
Norfolk, VA 23529-0162

Desh Ranjan, Chair

Michele Weigle, Graduate Program Director (MS Program)

Mohammad Zubair, Graduate Program Director (Ph.D. Program)

Programs

The Department of Computer Science offers programs leading to the Master of Science with a major in computer science, an accelerated five year combined B.S.C.S. and M.S. with a major in computer science and the Doctor of Philosophy in computer science. The Department of Computer Science also offers a Master of Science in computer science with a computer information sciences emphasis (jointly with the Information Technology Department in the Strome College of Business).

Computer science traces its foundation to mathematics, logic and engineering. Studies in computer science encompass theory, experimental techniques, and engineering methodology. The computer science curriculum exposes students to aspects of each of these disciplines and fosters an appreciation and understanding of them. Students are exposed to the broad theoretical basis of computer science through lecture and laboratory experience. The Computer Science Department has a unique curricular model that applies computer science education to the real world. In addition, the Computer Science Department offers a set of courses to professionals who need supplementary experience. A graduate of the computer science program will have a broad fundamental knowledge of the field and in-depth knowledge in a particular subject area. To acquire breadth, graduate students in the department are required to take core courses which together with the undergraduate core courses cover major aspects of computers and computation. At the master's level, the department supports in-depth study in the following areas:

- bioinformatics,
- data mining,
- digital libraries,
- high performance computing,
- networking,
- cybersecurity,
- software engineering, and
- computational foundations.

At the Ph.D. level, areas of specialization are limited only by the interests of the available faculty. The department has an excellent state of the art computing facility. Please visit the department's home page for details: <http://www.cs.odu.edu>.

Master of Science - Computer Science

Entrance Requirements

Students entering the Master of Science program in computer science should meet the minimum university graduate admission requirements (<http://www.odu.edu/admission/graduate>). In addition, an applicant must have a strong background in computer science. Students who do not have a sufficient background in computer science may enter the graduate program as provisional students and make up for their deficiencies by taking appropriate courses. Applicants are required to take the GRE aptitude test; for the computer information sciences emphasis area (described below), the GMAT aptitude test may be used. Two letters of recommendation from faculty members of academic institutions are required in addition to all transcripts at the postsecondary level. For students whose native language is not English, either a TOEFL score of 550 (paper-based) and 79 (internet-based) or IELTS score of 6.5 is also required.

Requirements

The departmental requirements for the master's degree are described below. All these requirements must be satisfied in addition to the University

requirements outlined under the Academic Information section of this Catalog.

Core courses

As approved by the GPD from a list of courses such as:

CS 550	Database Concepts	3
CS 555	Introduction to Networks and Communications	3
CS 517	Computational Methods and Software	3
CS 600	Algorithms and Data Structures	3
CS 665	Computer Architecture	3

Colloquium

Each student is required to take a one-credit CS 690 (Computer Science Colloquium) and attend at least 10 departmental colloquiums during their MS study.

Course options

Three options are available for candidates for master's degrees:

- thesis option,
- project option, and
- course-only option.

Thesis Option

Course work	24
Thesis research	6
Colloquium	1
Total Hours	31

A minimum of 31 credit hours is required. The candidate is required to write a thesis and make an oral presentation of the results.

Project Option

Course work	30
Project work	3
Colloquium	1
Total Hours	34

A minimum of 34 credit hours is required. The candidate is required to prepare a written report on the project and to present it orally.

Course-only Option

Course work	33
Colloquium	1
Total Hours	34

A minimum of 34 credit hours is required. In addition, the candidate is required to appear for an exit examination that requires a comprehensive written report and an oral examination.

Course restrictions

No more than six credits of the following courses may be counted towards the degree:

CS 697	Independent Study in Computer Science	
CS 791	Graduate Seminar	
CS 796	Topics in Computer Science	
Total Hours		0

A maximum of four 500-level courses can be applied to the program.

At least three credits counted toward the computer science degree must be taken at the 700-level from courses other than CS 791 and CS 796.

Time Limit

All requirements for the master's degree must be completed within six years.

Master of Science - Computer Information Systems Emphasis

Requirements

This area, offered jointly with the Information Systems and Technology Department of the Strome College of Business, is appropriate for students with either a bachelor's degree in business administration with a major in information systems and a computer science minor or with a bachelor's degree in computer science with a business administration minor.

Colloquium

Each student is required to take a one-credit CS 690 (Computer Science Colloquium) and attend at least 10 departmental colloquiums during their MS study.

Course options

Same as described above in the M.S. in computer science, with the following conditions:

- Project option: 15 credits (5 courses) must be CS graduate courses, and 15 credits (5 courses) must be IT graduate courses.
- Course-only option: 18 credits (6 courses) must be CS graduate courses, and 15 credits (5 courses) must be IT graduate courses.

Course restrictions

Same as described above in the M.S. in computer science.

In addition, at least two of the CS graduate courses (6 credits) must be taken at the 600-level or 700-level from courses other than CS 697, CS 791, and CS 796.

Time Limit

All requirements for the master's degree must be completed within six years.

Accelerated B.S. and M.S. in Computer Science

This program allows for exceptionally successful students to earn both a B.S. and M.S. in Computer Science within five years by allowing them to count up to 12 credits of graduate coursework toward both their bachelor's and master's degree in Computer Science. All options available under the MS program are available under this program.

Graduate Certificate Program in Cyber Security (On-line)

This on-line certificate program, which may be completed in one year, is designed to train working professionals (in computer science and related fields) in cyber security. The courses offered under this program may be taken by current students or new students. A student must first apply to the certificate program and be admitted to the program to be eligible to receive the certificate. A student admitted to this program may subsequently apply for MS in CS. If admitted, the courses taken during the certificate program may be considered towards the MS program.

Candidates for the program must at least have a 4-year Bachelor's degree from an accredited academic institution. The program requires a student to take four (or 12 credits) of the following courses. Each course has a normal letter grade and a student is expected to obtain a C or better in each course and maintain a 3.0 GPA. Following are the current offerings. Additional electives may be added in future.

CS 562	Cybersecurity Fundamentals	3
CS 563	Cryptography for Cybersecurity	3
CS 564	Networked Systems Security	3
CS 565	Information Assurance	3
Total Hours		12

Graduate Modeling and Simulation Certificate in Computing and Informatics

This certificate program has a focus on computational science and informatics disciplines. The required coursework includes introductory topics in fundamental theories and approaches in computer modeling and simulation. The elective courses enable students to develop deeper understanding in computer modeling and simulation and/or to make use of their knowledge to disciplines where modeling and simulation play a critical role.

Candidates for the program must have a 4-year Bachelor's degree from an accredited academic institution. The program requires a student to take four of the following courses. The student is required to take the **core course**, at most two foundation elective courses, and **at least one** advanced elective course. Each course has a normal letter grade. The student is expected to obtain a C or better in each course and maintain a 3.0 GPA.

Core Course

MSIM 601	Introduction to Modeling and Simulation	3
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Foundation Elective Courses (select up to 2 from the following):

CS 712	Stochastic Modeling	6
CS 713	Modeling and Simulation in Computational Biology	
CS 714	Monte Carlo Simulation	6
CS 715	Medical Image Computing and Simulation	
CS 716	Communication Networks Simulation and Evaluation	6
CS 722	Machine Learning	
CS 723	Introduction to Bioinformatics	6

Advanced Elective Courses (select at least 1 of the following at 700/800 level):

CS 712	Stochastic Modeling	3
CS 713	Modeling and Simulation in Computational Biology	
CS 714	Monte Carlo Simulation	3
CS 715	Medical Image Computing and Simulation	
CS 716	Communication Networks Simulation and Evaluation	3
CS 722	Machine Learning	
CS 723	Introduction to Bioinformatics	3
CS 724	High Performance Computing with GPU for Large Scale Simulation	
CS 725	Information Visualization	3
CS 726	Application of Graphs in Bioinformatics	

Total Hours		12
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Doctor of Philosophy - Computer Science

Admission

Students entering the Ph.D. program in the Computer Science Department should meet the minimum university graduate admission requirements (<http://www.odu.edu/admission/graduate>). Students may be admitted directly to the Ph.D. program with either a bachelor's or a master's degree. Prior to applying for admission, students are encouraged to visit the department's website and ensure that their research interests match with that of a faculty member. Students are expected to show proficiency in Problem Solving and Programming, Introduction to Computer Architecture, Advanced Data Structures and Algorithms, Introduction to Theoretical Computer Science, and Operating Systems at an undergraduate level. Those entering the Ph.D. program with deficiencies in these areas will have to make them up.

Requirements

A candidate for the doctoral degree in computer science must meet all of the following requirements in addition to the university requirements outlined under the Academic Information section in this Catalog:

1. Pass the Ph.D. qualifying process that consists of breadth oral examination, research ability oral examination, and advanced course requirement.
2. Complete a minimum of 72 credit hours beyond the bachelor's degree and 48 credit hours beyond the master's degree.
3. Pass the candidacy examination.
4. Attend at least 10 colloquia as detailed below.
5. Successfully defend the dissertation.

The above must be completed within eight years after admission to the Ph.D. program. Note that students with a degree in a discipline outside of computer science will be required to take prerequisite undergraduate courses that will not be counted towards the 72 credit hours requirement.

Advisor

Upon admission to the Ph.D. program, a faculty advisor will be assigned to the student for general guidance. The student, however, is expected to find a dissertation advisor by the time he or she completes the qualifying process.

Course Requirements

Students with a master's degree in computer science must complete coursework as specified below:

1. A minimum of 24 hours of post-master's coursework at 800-level.
2. Complete the dissertation work of 24 credit hours or more.
3. A maximum of six hours may be transferred into the Ph.D. program from post-master's coursework done elsewhere.

Students with an undergraduate degree in computer science must complete coursework as specified below:

1. 12 credit hours of core coursework approved by the GPD from a list of courses such as: CS 550, CS 555, CS 517, CS 600, and CS 665.
2. A minimum of 36 hours of coursework at 600-level or above, of which at least 24 credit hours must be at 800-level.
3. Complete the dissertation work of 24 credit hours or more.

Students with an undergraduate or master's degree in a discipline outside computer science must complete the 72 credit hours of coursework as specified above. Additionally, these students need to demonstrate proficiency in Problem Solving & Programming, Introduction to Computer Architecture, Advanced Data Structures and Algorithms, Introduction to Theoretical Computer Science and Operating Systems at an undergraduate level.

Research Guidance Committee

A Research Guidance Committee will be formed after the student has passed the breadth oral examination of the PhD qualifying process. The duties of a Research Guidance Committee are:

1. To advise the student on the course preparation, in particular to help prepare a plan of study.
2. To help define the research area of the student.
3. To prepare and administer the candidacy exam.

A Research Guidance Committee is formed according to the following procedure:

1. The student finds a regular faculty advisor. Note that a regular faculty advisor can be different from the temporary faculty advisor assigned to the student upon admission to the Ph.D. program.
2. The advisor selects the members of the Research Guidance Committee in cooperation with the student and the Graduate Studies Committee.
3. The Research Guidance Committee consists of *at least* three ODU faculty members. At least two of these must be from the Computer Science Department and one *may* be from outside of the Computer

Science Department. All committee members must be certified for graduate instruction. The current research interests of the computer science members of the committee should be related to the research goals of the student.

4. Additional members may be appointed to the committee.
5. The committee must complete a Ph.D. Guidance Committee Form. This form is submitted to the Graduate Program Director by the Graduate Studies Committee and to the Dean of the College of Sciences for approval.

Candidacy Examination

Upon completing coursework, before becoming heavily involved in dissertation work, and no later than three years after acceptance into the Ph.D. program (preferably during the first 18 months after admission into the program), the student must pass a candidacy examination. This examination is designed to test the student's knowledge of background material related to the dissertation topic and to determine if the student has identified a significant problem, has a plan of attack, and is ready to proceed with the dissertation research.

At least one week before the scheduled examination time (and preferably two weeks before), the student must provide the examination committee with a dissertation research proposal. The proposal should contain the following items (not necessarily in this order):

- a comprehensive literature review on the dissertation topic that should in particular discuss limitations of current approaches and open problems in the topic area
- a description of the research problem
- a discussion of how the problem relates to other work in the field
- a detailed research plan, including proposed tasks and a timeline for completion
- a list of expected contributions.

During the examination, the student will give a 45-minute presentation of the dissertation proposal to be followed by questions from the committee. The exam is expected to last no more than 2 hours.

The presentations of the dissertation proposal is open to the public and will be publicized by the GPD at least one week in advance of the exam. Once the presentation has concluded and the audience has asked general questions, the audience will be excused. The examination by the committee will be held in private, but graduate faculty members are welcome to observe the exam.

Dissertation Committee

After the candidacy exam has been passed and dissertation topic approved, the Research Guidance Committee's responsibilities are completed. A new committee, the Dissertation Committee, is formed to supervise the dissertation research.

A Dissertation Committee is formed according to the following procedure:

1. The faculty advisor selects the members of the Dissertation Committee in cooperation with the student and the Graduate Studies Committee.
2. The Dissertation Committee consists of *at least* three ODU faculty members. At least two of these must be from the Computer Science Department and one *must* be from outside of the Computer Science Department. All committee members must be certified for graduate instruction. The current research interests of the computer science members of the committee should be related to the research goals of the student.
3. Additional members may be appointed to the committee. Adjuncts (approved for graduate instruction) and non-university members may be added with approval of the GPD.
4. The committee must complete a Ph.D. Dissertation Committee Form. This form is submitted to the Graduate Program Director by the Graduate Studies Committee and to the Dean of the College of Sciences for approval.
5. The Associate Vice President for Graduate Studies is an ex-officio member of all Dissertation Committees.

Dissertation

A minimum of 24 credit hours of dissertation work is required. The work must represent an achievement in research and must be a significant contribution in the field. Students are required to publish (or have in the revision process) at least one paper in a refereed journal or refereed conference proceedings based on their dissertation work.

Dissertation Defense

The examination will be oral and the examination committee must have the completed dissertation at least two weeks before the examination date. In addition to the examination, students are required to give a public oral presentation on their dissertation results.

Time Requirement

Ph.D. students should normally be full-time. A full-time student can be expected to satisfy all the Ph.D. requirements in three to four years when entering with an M.S. degree or four to five years with a bachelor's degree. No student (full-time or part-time) will be allowed to study for the Ph.D. degree beyond eight years from the date of admission into the program.

Colloquium

Students are expected to actively participate in the colloquium activities of their research area for at least four semesters.

Ph.D. Qualifying Process

Students who have been admitted to study toward the doctoral degree in computer science must complete the qualifying process which may take up to 18 months after a student has been admitted in the Ph.D. program. The Ph.D. qualifying process consists of three components.

1. Breadth Oral Examination
2. Research Ability Oral Examination
3. Advanced Course Requirement

Breadth Oral Examination

The examination should be passed no later than 12 months after admission into the Ph.D. program (preferably during the first 6 months after admission into the program). In case a student fails the examination, it is still expected that the student will pass the examination within 12 months of admission. The examination may be repeated at most once.

The scheduling of this examination will be on-demand. A student wanting to take the breadth examination will contact the GPD at least six weeks before the suggested date of the examination. Once a student has requested an examination, a committee of four faculty members will be formed that will be responsible for evaluating the student.

The examination will last for two hours. On the day of the examination, the student will be given an initial list of questions two hours before the oral examination. Note that this list will not contain follow-on questions which the committee is free to ask. Students will be evaluated on their familiarity with core computer science topics. We have organized these topics under the undergraduate computer science course categories. The list of courses is given below. For the most recent syllabi for these courses, please visit: <http://www.cs.odu.edu>.

- Problem Solving & Programming (CS 250)
- Introduction to Computer Architecture (CS 270)
- Advanced Data Structures and Algorithms (CS 361)
- Introduction to Theoretical Computer Science (CS 390)
- Operating Systems (CS 471)

Research Ability Oral Examination

The examination should be passed no later than 18 months after admission into the Ph.D. program (preferably during the first 12 months after admission into the program). In case a student fails the examination, it is still expected that the student will pass the examination within 18 months of admission. The examination may be repeated at most once.

The scheduling of this examination will be on-demand. A student wanting to take the research ability examination will select one of the department

approved areas and contact the GPD at least six weeks before the desired date of the examination. Once a student has requested an examination, the selected area committee members will be responsible for evaluating the student.

A student who has completed a master's thesis and/or has publications accepted in referenced conferences/journals can apply to the GPD for exemption from the research ability examination. The exemption also requires an endorsement form an ODU CS faculty member who is willing to be the student's Ph.D. advisor. Please contact the GPD for details.

The examination will last two hours. On the day of the examination, the student will be given an initial list of questions two hours before the oral examination. Not that this list will not contain follow-on questions, which the committee is free to ask. Students will be evaluated on their understanding of the reading list (list of papers, book chapters, etc.) maintained by each area committee.

Advanced-level Course Requirement

Ph. D. students are expected to take at least four 800-level regular courses. These four courses should be taught by at least three different faculty members. Ph.D. students are expected to maintain a minimum grade of B in each of these courses. If you have any doubt whether a course is a regular 800-level course and will be counted toward this requirement, please check with your GPD. This requirement should be completed no later than 18 months after admission into the program. Note that these courses will be counted toward the minimum 800-level credit hour requirement for Ph.D. students.

Department of Mathematics and Statistics

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Norfolk, VA 23529
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Hideko Kineko, Chair
Raymond Cheng, Graduate Program Director
N. Rao Chaganty, Statistics Program Director

Graduate Study in Computational and Applied Mathematics

The master's and doctoral programs in computational and applied mathematics offered by the Department of Mathematics and Statistics are designed to produce applied mathematicians and statisticians who can meet the growing demand for analytical and computational skills in traditional scientific and multi-disciplinary fields. Students in the program can choose to pursue an option in either applied mathematics, statistics, or biostatistics.

Applied mathematics is the application of mathematics to the solution of non-mathematical problems. Such problems may originate in math-oriented fields (physics, chemistry, and engineering) as well as in such areas such as geology, oceanography, meteorology, biology, ecology, environmental health, economics, actuarial science, business (operations and market research), banking, and medicine. Students will learn to use methods of applied mathematics, probability, statistics, biostatistics, numerical analysis, and scientific computing in seeking solutions to such problems. For work in computational and applied mathematics, training in an additional field of application is a necessity.

The desire and ability to use mathematics to bring together various disciplines is the unique characteristic of an applied mathematician. Not only has mathematical modeling and solving of societal and scientific problems increased the demand for applied mathematicians, but the flexibility and breadth of knowledge inherent in this discipline make it attractive for those who do not want to become irreversibly specialized.

Old Dominion University is one of the few American institutions offering a program expressly in applied mathematics. There are approximately 22 graduate program faculty members in the Department of Mathematics

and Statistics, and current enrollment in the program is about 50 students. Areas of faculty research include analytical and numerical modeling in oceanography and meteorology, computational fluid dynamics and stability theory, elasticity and fracture mechanics, combustion theory, magnetohydrodynamics, mathematical biology, numerical analysis and approximation, optimization, applied probability, statistical inference, reliability, multivariate statistics, generalized linear models, estimating equations, biostatistics, nonparametric statistics, bioinformatics, and high performance computing.

Facilities within the metropolitan area include the NASA/Langley Research Center, the Virginia Modeling, Analysis and Simulation Center (VMASC), and the Eastern Virginia Medical School.

Program Financial Aid. Graduate assistantships in the Department of Mathematics and Statistics offer stipends ranging from \$15,000 to \$18,000. The level of award is determined on the basis of previous experience and performance as a graduate assistant and on the student's academic achievement and potential in applied mathematics or statistics. In addition, a number of teaching and research positions are available for financial support of graduate assistants during the summer months (June and July).

Writing Proficiency. All students in the graduate program are expected to demonstrate an acceptable level of writing ability. Students needing help to remedy their writing deficiencies will be referred to the Writing Center for diagnosis and assistance. All M.S. candidates will enroll in MATH 632 or in STAT 632 for a master's project.

Master of Science - Computational and Applied Mathematics

Admission

An applicant to the master's program in computational and applied mathematics should have a bachelor's degree in mathematics, statistics, computer science, or an application area with a strong mathematics component (e.g., physics or engineering). Undergraduate mathematics preparation should include course work in linear algebra, advanced calculus, differential equations, probability, and numerical methods. Undergraduate averages of 2.80 overall (4.00 scale) and 3.00 in the major and related mathematics courses are required.

A student who does not fully meet all requirements for admission as a regular graduate student may be allowed, with permission of the program director, to enroll as a provisional graduate student. Students lacking adequate preparation will be required to make up their deficiencies by taking appropriate undergraduate courses in addition to those specified for the master's program.

A formal application form, official transcripts, and two letters of recommendation should be forwarded to the Office of Admissions. It is recommended that applicants supply Graduate Record Examination aptitude scores.

The following material should be mailed directly to the director of the graduate program in computational and applied mathematics, Department of Mathematics and Statistics: a list of all mathematics courses taken and other courses closely allied to the applicant's primary interests in applied math or statistics along with the texts used (titles and authors), chapters studied or topics covered, and grades. This information should be enclosed with the financial aid application (if the applicant is submitting one).

Students may enroll in the program on either a full-time or part-time basis. Courses are offered on a regular basis during the late afternoon and early evening hours which allows part-time students to obtain master's degrees or post-master's graduate credit.

Requirements

The M.S. candidate must complete a minimum of 31 normal credit hours of course work designed to fulfill an option in either applied mathematics, statistics or biostatistics. With approval of the graduate program director, up to six of these credits may be chosen from a field of application (e.g., geology, oceanography, ecosystem analysis, computer science, economics, health sciences, operations research, physics and engineering mechanics)

in which the student applies analytical and numerical techniques to another discipline. All programs of study must be approved by the graduate program director, and substitutions may be made only with his or her approval.

Master's Project Requirement

The M.S. candidate will be assigned to a faculty advisor for a master's project. Each student will enroll in MATH 632 or STAT 632 to complete his/her project. The master's project is designed not only to broaden students' analytical competency but also to enhance students' writing and reporting skills on a technical subject.

Colloquium Requirement

In order to develop an appreciation for the breadth of contemporary research in applied mathematics and statistics, all M.S. candidates will attend and succinctly summarize and evaluate in writing at least eight professional seminars given by research faculty or external seminar visitors. The Richard F. Barry Colloquium Series is run by the department throughout the academic year. The department also conducts seminars jointly with other departments.

Prerequisites

Prerequisite courses for the applied mathematics option are:

At most, three from the following can be applied towards the 31-credit degree requirement:

MATH 501	Partial Differential Equations	3
MATH 508	Applied Numerical Methods I	3
MATH 509	Applied Numerical Methods II	3
MATH 517	Intermediate Real Analysis I	3
MATH 518	Intermediate Real Analysis II	3
MATH 522	Applied Complex Variables	3

Prerequisite courses for the Statistics and Biostatistics options are:

MATH 316	Introductory Linear Algebra	3
STAT 331	Theory of Probability	3
STAT 431/531	Theory of Statistics	3
STAT 532	Sampling Theory *	3
STAT 535	Design and Analysis of Experiments *	3
STAT 537	Applied Regression Analysis *	3

* Only these courses can be applied towards the 31-credit degree requirement.

Applied Mathematics Option

MATH 617	Measure and Integration	3
MATH 618	Applied Functional Analysis	3
MATH 632	Master's Project	3
MATH 637	Tensor Calculus and Differential Geometry	3
MATH 693	Engineering Analysis III	3
MATH 622	Numerical Solutions to Differential Equations	3
or MATH 721	Advanced Applied Numerical Methods I	

And at least 15 additional credit hours of approved graduate course work

Total Hours	33
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Statistics Option

STAT 505	Introduction to Data Handling	3
STAT 535	Design and Analysis of Experiments	3
STAT 537	Applied Regression Analysis	3
STAT 625	Mathematical Statistics I	3
STAT 626	Mathematical Statistics II	3
STAT 627	Linear Statistical Models	3

or STAT 628	Applied Multivariate Analysis	
STAT 632	Master's Project	3
STAT 640	Survival Analysis	3
At least 6 additional credits of approved graduate course work		6
Total Hours		30

Biostatistics Option

STAT 505	Introduction to Data Handling	3
STAT 535	Design and Analysis of Experiments	3
STAT 537	Applied Regression Analysis	3
STAT 540	Clinical Trials	3
STAT 550	Categorical Data Analysis	3
STAT 625	Mathematical Statistics I	3
STAT 626	Mathematical Statistics II	3
STAT 627	Linear Statistical Models	3
or STAT 628	Applied Multivariate Analysis	
STAT 640	Survival Analysis	3
Total Hours		27

And two 600-level courses from either the College of Health Sciences or the Eastern Virginia Medical School offerings in epidemiology, community health, or history of diseases. Also required is the master's project, STAT 632, involving the use of statistical techniques in medical or health related real-life settings.

Certificate in Modeling and Simulation

The Department of Mathematics and Statistics at Old Dominion University plays an integral part in the University's campus-wide initiative to promote its research in Modeling and Simulation. The Department of Mathematics and Statistics offers a certificate in Modeling and Simulation. In order to obtain a certificate in Modeling and Simulation, a student must complete four graduate courses that include MSIM 601 (Introduction to Modeling and Simulation). MSIM 601 is offered by the Department of Engineering Management and System Engineering. Students may select three other simulation courses from the following Modeling and Simulation courses.

Modeling and Simulation courses in Computational Mathematics

Required Course		3
MSIM 601	Introduction to Modeling and Simulation	
Select three from the following:		9
MATH 508	Applied Numerical Methods I	
MATH 509	Applied Numerical Methods II	
MATH 622	Numerical Solutions to Differential Equations	
MATH 632	Master's Project	
MATH 721/821	Advanced Applied Numerical Methods I	
MATH 722/822	Advanced Applied Numerical Methods II	
Total Hours		12

Modeling and Simulation courses in Statistics

Required Course		3
MSIM 601	Introduction to Modeling and Simulation	
Select three from the following:		9
STAT 535	Design and Analysis of Experiments	
STAT 537	Applied Regression Analysis	
STAT 560	Statistical Simulation/Programming Using Statistical Software Packages	
STAT 597/697	Topics in Statistics	
STAT 630	Time Series Models	
STAT 632	Master's Project	

STAT 640	Survival Analysis	
Total Hours		12

Master of Science in Education - Mathematics

Refer to the Darden College of Education section of this Catalog (p. 100).

Doctor of Philosophy - Computational and Applied Mathematics

Admission

Applicants who appear to be qualified for study at an advanced graduate level may be admitted to the doctoral program in computational and applied mathematics. These will be students with very strong backgrounds in mathematics, statistics, computer science, or application areas with a mathematics component (e.g. physics or engineering).

Students may be admitted directly to the Ph.D. program with either a bachelor's or a master's degree. A grade point average of 3.00 (4.00 scale) in the major and related mathematics courses is required.

Students are required to submit three letters of recommendation, and GRE aptitude scores, if the student will not have completed a master's degree in the mathematical sciences by the intended date of admission.

Requirements

Course Requirements

A minimum of 55 normal credit hours of course work beyond the bachelor's degree (24 credit hours beyond the master's degree) and exclusive of doctoral dissertation work is required. Each student will be assigned a guidance committee, and together they will plan a complete program of course work designed to meet the student's objectives and to fulfill an option in applied mathematics, statistics or biostatistics. The student is strongly encouraged to select courses in more than one of these option areas and in a field of application whenever such courses contribute appropriately to his or her program. Each program, however, must be directed and approved by the student's guidance committee. A student receiving a grade of C+ or lower in any graduate course may be dropped from the program.

While the individual program will depend on the nature of the student's preparation prior to entering, each participant will ordinarily be required to complete one of the following options:

Applied Mathematics Option

MATH 605	Complex Variables I	3
MATH 617	Measure and Integration	3
MATH 618	Applied Functional Analysis	3
MATH 622	Numerical Solutions to Differential Equations	3
MATH 637	Tensor Calculus and Differential Geometry	3
MATH 638	Mathematical Theories of Continua	3
MATH 693	Engineering Analysis III	3
MATH 801 & MATH 802	Asymptotic and Perturbation Methods and Integral Equations	6
MATH 821 & MATH 822	Advanced Applied Numerical Methods I and Advanced Applied Numerical Methods II	6
MATH 803 or MATH 825	Advanced Applied Mathematics I Computational Fluid Dynamics and Solid Mechanics	3
Total Hours		36

Statistics or Biostatistics Option

MATH 517	Intermediate Real Analysis I	3
STAT 547	Analysis of Longitudinal Data	3
STAT 550	Categorical Data Analysis	3
STAT 625	Mathematical Statistics I	3

STAT 626	Mathematical Statistics II	3
STAT 627	Linear Statistical Models	3
STAT 628	Applied Multivariate Analysis	3
STAT 630	Time Series Models	3
STAT 640	Survival Analysis	3
STAT 827	Statistical Inference I	3
STAT 828	Statistical Inference II	3
Total Hours		33

Students who wish to concentrate in Biostatistics must take STAT 540 and at least six credits at the 700-level from either the College of Health Sciences or the Eastern Virginia Medical School offerings in epidemiology, community health, or history of diseases.

Colloquium Requirement

In order to develop an appreciation for the breadth of contemporary research in applied mathematics and statistics, all Ph.D. candidates will attend and succinctly summarize and evaluate in writing at least 16 professional seminars given by research faculty or external seminar visitors. The Richard F. Barry Colloquium Series is run by the department throughout the academic year. The department also conducts seminars jointly with other departments.

Foreign Language

A foreign language is not required.

Residency Requirement

An essential feature of doctoral study is the provision of total concentration on the field of study for significant periods of time. Students who wish to pursue a part of their doctoral study on a part-time basis may do so, but all doctoral students shall spend at least two academic years engaged in full-time graduate study.

Admission to Candidacy Examination

At the end of the core mathematics or statistics course work and prior to selecting a dissertation advisor, the student must pass an Admission to Candidacy Examination designed to test scholarly competence and knowledge and to give the examiners a basis for constructive recommendations on subsequent study. The written portion of this examination will be based upon an examination syllabus that will be provided to each student. The outcome of this examination will be reported to the vice provost for graduate studies and research as passed, failed, additional work to be completed, or to be re-examined. In the event of a re-examination, the outcome must be reported as passed or failed. This decision is final. The examination must be passed at least eight months prior to the granting of the degree.

Dissertation

A doctoral dissertation representing an achievement in research and a significant contribution to the field is required. Students must register for MATH 898 or MATH 899 each semester in which they are doing substantial work on their dissertations. A minimum of 24 hours of such research credit is required.

Defense of Dissertation

This examination will be oral and must be completed at least four weeks before the date on which the degree is to be conferred. The dissertation committee members must have the completed dissertation at least two weeks before the date of the oral examination. Under normal circumstances, it is expected that the student will have had a research paper accepted for publication prior to the dissertation defense.

Department of Ocean, Earth and Atmospheric Sciences

406 Oceanography and Physics Building
Norfolk, VA 23529
757.683.4285

H. Rodger Harvey, Chair
 Peter N. Sedwick, Graduate Program Director

Mission

The Department of Ocean, Earth and Atmospheric Sciences acquires and disseminates knowledge of the earth system, including the relationships among the biological, chemical, geological, and physical components of our planet. It is critical that we understand both natural and human-induced processes that change this system so we are prepared to meet present and future challenges to our society. With curiosity, creativity, scholarship, and respect as cornerstones of our philosophy, we strive to increase scientific knowledge and literacy through excellence in research, education, and service to the Commonwealth of Virginia and society in general.

General Description of Graduate Degrees

Two graduate programs are offered:

- Master of Science in Ocean and Earth Sciences
- Doctor of Philosophy in Oceanography

The Master of Science degree has both thesis and non-thesis options. Areas of emphasis are biological, chemical, and physical oceanography and geological sciences. Interdisciplinary studies are encouraged and often an integral part of the student experience. The curriculum is designed to prepare graduates for professional practice in their area of interest. Official transcripts, letters of recommendation, TOEFL scores (international students), and a statement of goals and interest for graduate study should all be submitted to the Office of Admissions by February 1 for full consideration. Scores on the GRE verbal, analytical, and quantitative sections are required

The department receives considerable support from the Commonwealth and local philanthropic sources, as well as from private industry and federal agencies. Establishment of the Virginia Graduate Marine Science consortium by the General Assembly in 1979 demonstrated the Commonwealth's determination to achieve excellence in marine science. The purpose of the consortium is to advance marine science instruction, research, training, and advisory services and to enhance Virginia's position in seeking funding to carry out these activities. Charter members of the consortium are Old Dominion University, the University of Virginia, Virginia Polytechnic Institute and State University, and the College of William and Mary. The Samuel L. and Fay M. Slover endowment to Old Dominion University in 1986 significantly accelerated the program of marine studies. In 1991, a Center for Coastal Physical Oceanography (CCPO) was established at Old Dominion University by the Commonwealth of Virginia. The center is a Designated Center for Excellence.

The Department of Ocean, Earth and Atmospheric Sciences is housed in three buildings. The Oceanography/Physical Sciences Building contains state-of-the-art teaching laboratories, computer facilities, and research laboratories for geological sciences and biological, chemical and geological oceanography. The Center for Coastal Physical Oceanography is located in ODU's Innovative Research Park and houses all of the department's physical oceanography laboratories. The Center for Quantitative Fisheries Ecology is housed close to campus. The department maintains a 55-foot research vessel, the R/V Fay Slover, primarily for estuarine and coastal studies. In addition to the Slover, the department has a number of small boats, suitable for near shore investigations.

Graduate Certificate in Spatial Analysis of Coastal Environments

The certificate in spatial analysis of coastal environments provides an interdisciplinary program for students wishing to pursue careers in coastal management or research, remote sensing, or geographic information systems (GIS) applications. Rendered upon completion of the requirements, the certificate is an academic affidavit comprised of courses in geography and ocean, earth, and atmospheric sciences and is administered by the two departments. Students must take courses in the areas listed below and

complete them with a cumulative GPA of 3.00 or higher and no grade below a C (2.00). The certificate is available to postgraduate professionals who meet the requirements. Students with comparable professional experience may be able to show competence in selected courses through examination.

Students seeking graduate certification are required to complete the 500-level courses.

I. Core Courses		6
GEOG 504	Digital Techniques for Remote Sensing	
BIOL 519	Wetland Plants	
BIOL 550	Principles of Plant Ecology	
OEAS 511	Structural Geology	
OEAS 526	Concepts in Oceanography for Teachers	
II. Interpretive Analysis Courses (Select two from the following)		6
GEOG 502	Geographic Information Systems	
GEOG 522	Coastal Geography	
GEOG 590	Applied Cartography/GIS	
OEAS 595	Special Topics	
GEOG 595	Topics in Geography	
III. Capstone Seminar		3
Select one of the following:		
GEOG 519	Spatial Analysis of Coastal Environments	
OEAS 519	Spatial Analysis of Coastal Environments	
Total Hours		15

Master of Science - Ocean and Earth Sciences

Peter N. Sedwick, Graduate Program Director

Admission

Applicants who have obtained a bachelor's degree in a science (e.g., biology, chemistry, geology, physics), mathematics, or engineering, with a minimum 3.00 grade point average in their major and a 2.80 overall grade point average, are eligible for regular admission to the program. At least one semester of calculus is also required. Ocean and earth sciences is an interdisciplinary endeavor and it is expected that applicants have science courses outside their major.

For students wishing to study geological sciences, an undergraduate major in geology is required for regular admission. Students wishing to study physical oceanography should have majored in physics, mathematics, engineering, computer science, meteorology or a related physical sciences. Such applicants must have completed 36 hours in one of these fields and completed mathematics through partial differential equations.

An applicant who does not meet all requirements for admission as a regular graduate student may be admitted as a provisional graduate student. Students lacking adequate preparation for the program may make up deficiencies by taking appropriate undergraduate courses.

Requirements

The student shall meet all university requirements for graduate degrees outlined in the Requirements for Graduate Degree section in this catalog, including at least 30 hours of graduate study. A maximum of 12 hours of credit may be transferred into a graduate degree program from non-degree status at Old Dominion University or from another accredited institution, except in the case of an approved interinstitutional program. All students are expected to demonstrate competency in oral communication and proficiency in writing.

Course Distribution

A minimum of 13 hours of basic course work in the four sub-disciplines of oceanography is required of all M.S. students. This core program consists of:

OEAS 604	Introduction to Physical Oceanography	3
OEAS 610	Advanced Chemical Oceanography	3

OEAS 620	Advanced Geological Sciences	3
OEAS 640	Advanced Biological Oceanography	4
Total Hours		13

A student must achieve a grade of B or better in each of the core courses. The remaining 18 credits are chosen from a list of graduate courses approved by the student's guidance committee. At least 60 percent of all courses must be at the 600 level or above. For the non-thesis option, up to three hours of research may be used to meet course requirements. For the thesis option, up to six hours of research may be used to meet the course requirements.

Non-Thesis Option

A student in the non-thesis program must pass a written comprehensive examination testing breadth of knowledge in oceanography. The examination is given twice yearly, normally in October and March. The examination grades are fail, pass, or pass with distinction. A student who has failed the examination may retake it only once.

Thesis Option

Before a student embarks on thesis research, a thesis advisory committee must be formed. Further information on university guidelines for forming this committee can be found in the Requirements for Graduate Degrees section of this catalog. The student must also submit a thesis proposal which outlines the research to be undertaken and identifies the resources required for completion of the research. Guidelines for the preparation of the thesis proposal are available from the graduate program director. Any student whose thesis research requires departmental funding must obtain prior approval from the department chair and graduate program director. No funds will be given without this approval. The thesis proposal requires the approval of the graduate program director and the student's thesis advisory committee.

As part of the thesis requirement, the student is required to present a public defense of the research. The public defense and approval of the thesis by the student's Thesis Committee satisfy the comprehensive examination requirement. Students in the thesis program should consult the graduate program director regarding the preparation of the M.S. thesis, scheduling a thesis defense, and the final submission of the thesis.

Time Requirement and Field Work

Each student is required to have at least ten days of shipboard experience, fieldwork, or a combination of the two. Scheduled class field trips may not be counted toward this requirement.

Request to Graduate

The student should complete an Application for Graduation form through the Registrar's Office. The deadline for submitting this application is listed in the class schedule each semester and usually falls near the end of the semester preceding the one during which graduation is anticipated. It is the student's responsibility to meet these deadlines and submit the necessary paperwork for graduation.

Removal of Incompletes

At least one month prior to graduation, all incomplete grades should be cleared. An Academic Record Change form is used for this purpose, and the instructor of the course and the department chair need to sign this form.

Doctor of Philosophy - Oceanography

Peter N. Sedwick, Graduate Program Director

Admission

The doctoral degree in oceanography is granted to students who have:

1. mastered definite fields of knowledge, become familiar with research in these specific fields, and developed an informed understanding of opportunities for further advances;
2. demonstrated the capacity to do original, independent, scholarly work in their specific fields; and

3. shown the ability to integrate the field of specialization with the larger domains of knowledge and understanding.

All students are expected to demonstrate competency in oral communication and proficiency in writing.

All students in the oceanography Ph.D. program are responsible for reading and understanding the regulations and policies set forth throughout this catalog regarding requirements for the Ph.D. degree. The essential credit requirements for the Ph.D. are as follows. The student shall complete 48 credit hours beyond the master's degree or 78 credit hours for students admitted to the program with a bachelor's degree. Up to 24 credits can be granted for dissertation.

Requirements

Major Advisor and Guidance Committee

A major advisor must be identified to the graduate program director (GPD), at least provisionally, prior to admission to the program. After receiving admission to the program and enrollment, students should consult with the GPD and their major advisor for guidance on initial course work. Before the completion of nine semester hours (i.e. before the end of the student's first semester), the student will form a guidance committee in consultation with the major advisor. Please see the graduate program director and the Requirements for Graduate Degrees section of this catalog for further information on forming a guidance committee.

Plan of Study—Curriculum Plan

Sometime in the first year of study, the student shall prepare a plan of study with the aid and approval of the guidance committee. Students should see the graduate program director and refer to the Requirements for Graduate Degrees section of this catalog for further information on preparing a plan of study.

Course Work Requirements

Students who do not have an M.S. degree in oceanography normally complete the following within the first year:

OEAS 604	Introduction to Physical Oceanography	3
OEAS 610	Advanced Chemical Oceanography	3
OEAS 620	Advanced Geological Sciences	3
OEAS 640	Advanced Biological Oceanography	4
Total Hours		13

However, waiving the requirement to take any of these core courses requires the approval of the graduate program director. Students must achieve a grade of B or better in each of the core courses. Any student receiving a C (2.0) or lower in any graduate course may be dropped from the program. In consultation with the advisor and guidance committee, students will plan a complete program of course work designed to meet their objectives (see the section above). Depending on the entry status of the student, the following credit hours are also required:

- Those entering the Ph.D. program with an M.S. degree in oceanography must complete any needed core courses (see above), and a minimum of 48 credit hours of lecture courses and dissertation research.
- Those entering the Ph.D. program with a B.S. or M.S. degree in a discipline outside of oceanography shall complete 12 credit hours of the core courses listed above, and a minimum of 66 hours of additional lecture courses and dissertation research, for a total of 78 credit hours.

A maximum of 12 graduate credit hours may be transferred into a graduate degree program from non-degree status at Old Dominion University or from another accredited institution, except in the case of an approved interinstitutional program.

Diagnostic Examination

The guidance committee shall administer a written and oral diagnostic examination during the first semester of residence (or before nine credit hours have been completed) for students entering the program with an M.S. degree in oceanography. For students matriculating with a bachelor's degree or an M.S. degree in another field, the guidance committee shall administer

the diagnostic examination no later than the third semester of residence (or before completion of 27 credit hours). The diagnostic examination will be prepared by the student's guidance committee in consultation with the graduate program director. The results of this examination are used as guidance for the curriculum plan. The guidance committee may also recommend to the graduate program director, based on the student's performance in the four oceanography core courses, that the diagnostic examination be waived. This must be done in writing, in a memo signed by all members of the student's guidance committee.

Computer Language Skills

To satisfy this requirement the student must either take a course in MATLAB programming (OEAS 595) or solve a substantial problem by writing an original computer program. The student's advisor in consultation with the guidance committee develops the problem and a reasonable timetable for its completion. The problem must be solved independently with no help from others. The results will be evaluated by the advisor and guidance committee who will determine whether the student has solved the posed problem to their satisfaction. This computer language skills requirement should be completed before taking the candidacy exam.

Ship Time Requirement and Fieldwork

Each student is required to have at least ten days of shipboard experience, fieldwork, or a combination of the two. Scheduled class field trips may not be counted toward this requirement.

Candidacy Exam

Near the completion of course work and before becoming heavily involved in dissertation work, the student shall pass a candidacy examination designed to test scholarly competence and knowledge of oceanography. The exam has written and oral portions prepared by the guidance committee. Additional details on the structure, form and content of the candidacy exam are available from the graduate program director and in the Requirements for Graduate Degrees section in this Catalog.

Formation of a Dissertation Committee

After the candidacy examination has been passed and the dissertation committee formed, the guidance committee's responsibilities are completed. The dissertation committee is a new committee and is formed to supervise the student's dissertation research. Students should see the graduate program director or refer to the Requirements for Graduate Degrees section in this Catalog for further information on the formation of a dissertation committee.

Changes to the dissertation committee must be made in advance of the oral dissertation defense. Such changes are made only with the approval of the GPD and college dean.

Admission to Candidacy

Admission to candidacy is a formal step that occurs after the student has:

1. passed both parts of the Ph.D. candidacy examination;
2. filed a dissertation prospectus approved by the student's dissertation committee; and,
3. completed all formal course work.

The student must be admitted to candidacy at least 12 months before the time the degree is expected to be received, but usually not before the completion of one-and-a-half years of graduate work.

Dissertation Preparation

General regulations and procedures governing the submission of a doctoral dissertation are given in the Guide for Preparation of Theses and Dissertations (obtained at <http://sci.odu.edu/sci/about/information/thesis/index.shtml>). Students should read this guide carefully before beginning to write their dissertation. Writing the dissertation as chapters that can be submitted for publication is encouraged.

Please note that the thesis and dissertation guide in place at the start of the semester will remain in force for the entire semester, and any changes made to the guide over the academic year (and the dates of these changes) will be listed on the cover page of the guide. Changes to the previous guide will

also be noted on the cover page of the guide, or in a separate document that can be downloaded from the same site as the complete guide. For more information on dissertation preparation and approval in the College of Sciences, see: <http://sci.odu.edu/sci/about/information/thesis/index.shtml>.

Dissertation Defense

The format of a dissertation defense is determined by the dissertation committee with the approval of the GPD. The defense is chaired by the director of the dissertation committee. The chair will act as moderator, ruling on questions of procedure and protocol that may arise during the defense. Students should see the graduate program director or refer to the Requirements for Graduate Degrees section in this catalog for further information on the format of the dissertation defense.

Satisfactory performance on this examination (oral dissertation defense) and adherence to all regulations outlined above complete the requirements for the Ph.D. degree. All requirements for the doctoral degree must be completed within eight calendar years from the date of initial registration in the program.

Dissertation Acceptance and Submission

Once the dissertation committee has approved the dissertation, the student and major advisor must review the entire dissertation to ensure that it adheres to the format described in the Guide for Preparation of Theses and Dissertations before submitting the dissertation to the GPD for final review. Ten days should be allowed for GPD review. Once the GPD has approved the dissertation, the student submits the dissertation to the associate dean in the College of Sciences for approval. All approvals must be completed by the day before commencement. However, the associate dean generally requires that all dissertations be submitted prior to this deadline. Students should consult with the GPD for further details.

Request to Graduate

The student should obtain a copy of the form Application for Graduation from the Registrar's Office and complete this application. The deadline for submitting this application is listed on the Registrar's Office website at www.odu.edu/registrar and usually falls near the end of the semester preceding the one during which graduation is anticipated. It is the student's responsibility to meet these deadlines and submit the necessary paperwork for graduation.

Removal of Incompletes

At least one month prior to graduation, all incomplete grades should be cleared. An Academic Record Change form is used for this purpose, and the instructor of the course and the department chair need to sign this form.

Department of Physics

306 Oceanography/Physics Bldg.
(757) 683-3468
<http://sci.odu.edu/physics/>

Charles I. Sukenik, Chair
Leposava Vuskovic, Graduate Program Director

The Department of Physics offers programs of study leading to both the M.S. degree in physics and the Ph.D. degree in physics. Primary focus is placed on the Ph.D. program, and most students enrolled for graduate study are enrolled in that program. Students have the opportunity to perform research in state-of-the-art facilities under faculty direction. Graduates are prepared for research at the highest levels in academia, government laboratories, and corporate laboratories.

Admission

Applicants for admission to graduate study must have an earned bachelor's degree in physics or a closely related discipline from an accredited institution or an equivalent degree from a foreign institution. The applicant is normally required to have a minimum cumulative grade point average of 3.0 on a 4.0 scale. In addition, the general portion of the Graduate Record Examination (GRE) is required for application to either the master's or the doctoral program; applicants to the doctoral program are strongly

encouraged to take the GRE specialized physics test as well. The Test of English as a Second Language (TOEFL) is required of all nonnative speakers of English who have resided in the U.S. for less than ten years.

It is normally expected that most incoming graduate students will be supported as teaching assistants. Old Dominion University requires that all graduate teaching assistants who do not speak English as a first language pass a test of spoken English.

Admission decisions are based on undergraduate achievement, GRE scores, and personal reference letters. Graduate study may commence at the beginning of any academic term. Decisions regarding financial support for students entering in the fall term are normally made by April 15, so a student's completed application must be received by January 15. Anyone who applies after January 15 should communicate directly with the Department of Physics concerning the availability of support.

Master of Science - Physics

Requirements

A student may select either the thesis or non-thesis option. For either option, each student's course of study must have the advance approval of the graduate program director.

Non-Thesis Option

Thirty graduate credits that must include the following courses:

PHYS 556	Intermediate Quantum Mechanics	3
or PHYS 621	Quantum Mechanics I	
PHYS 603	Classical Mechanics	3
PHYS 604	Classical Electrodynamics I	3
PHYS 697	Seminar	1

No more than 12 credits numbered at the 500 level may be used to meet this requirement.

Up to 12 credits from other University departments may be used to meet this requirement if approved by the graduate program director.

Written Comprehensive Examination

In addition to these course requirements, the candidate must pass a written comprehensive examination. It is usually taken just before the student's third semester of study. If a student fails this examination, he or she is allowed a second attempt, which must be at the time when the Written Exam is next given. In all but the most extraordinary circumstances, a student will not be allowed any additional attempts to pass this examination. Normally, this written examination is the same as the written portion of the Ph.D. Candidacy Examination, graded at the master's level.

Foreign language requirement

None.

Thesis Option

Thirty graduate credits that must include the following courses:

PHYS 556	Intermediate Quantum Mechanics	3
or PHYS 621	Quantum Mechanics I	
PHYS 603	Classical Mechanics	3
PHYS 604	Classical Electrodynamics I	3
PHYS 697	Seminar	1
PHYS 698	Research	3
PHYS 699	Research	3

No more than 12 credits numbered at the 500 level may be used to meet this requirement.

Up to 12 credits from other university departments may be used to meet this requirement if approved by the graduate program director.

Doctor of Philosophy - Physics

Requirements

The broad requirements for the Ph.D. degree are

1. satisfactory performance in a designated core of graduate courses,
2. successful completion of the Ph.D. Candidacy Examination, which has both written and oral parts,
3. successful completion of a teaching requirement, and
4. satisfactory completion of a dissertation.

Each student's course of study must have the advance approval of the graduate program director.

Course Requirements

Seventy-eight graduate credits beyond the undergraduate degree or 48 graduate credits beyond the master's degree must be taken and must include the following courses:

PHYS 601	Mathematical Methods in Physics	3
PHYS 603	Classical Mechanics	3
PHYS 604	Classical Electrodynamics I	3
PHYS 621	Quantum Mechanics I	3
PHYS 697	Seminar	1
PHYS 804	Classical Electrodynamics II	3
PHYS 807	Statistical Mechanics	3
PHYS 811	Computational Physics	3
PHYS 821	Quantum Mechanics II	3
PHYS 831	Advanced Seminar I	1
PHYS 832	Advanced Seminar II	1

A minimum of six additional credits for specialized full-semester courses at the 800 level must be taken. A student may waive or substitute for any of these courses with the approval of the graduate program director.

Up to 12 credits from other university departments may be used to meet this requirement if approved by the graduate program director. A student may waive PHYS 832, with the approval of the graduate program director, if he or she presents a paper at a scientific meeting. Before formation of his or her dissertation committee, a student is formally advised about these courses and other academic matters by graduate faculty advisors. There is no foreign language requirement.

Ph.D. Candidacy Examination

A student admitted to the Ph.D. program in physics becomes a bona fide candidate for the Ph.D. degree by passing the Ph.D. Candidacy Examination. The purpose of this comprehensive examination is to determine if a student has the foundation and maturity to begin research in physics. A student who does not pass the Ph.D. Candidacy Examination within the allowed number of attempts explained below will be dismissed from the Ph.D. program. However, that student would still have the opportunity to satisfy the requirements for the M.S. degree in physics.

The Ph.D. Candidacy Examination consists of two parts—the Written Examination and the Oral Examination. Each part must be passed independently in order to pass the Ph.D. Candidacy Examination.

Written Examination

The written examination is given two times each year—in late August and early January. A student admitted to the Ph.D. program must take this examination by the beginning of his or her third semester of graduate study. In circumstances such that the student has not had the appropriate courses to meet this deadline, he or she may petition the Graduate Program Committee for an extension. If a student fails this examination, he or she is allowed a second attempt, which must be at the time when the Written Examination is next given. In all but the most extraordinary circumstances, a student is dismissed from the Ph.D. program after failing the written examination twice.

Oral Examination

The Oral Examination is a one-hour presentation given by a student to an oral examination committee (normally consisting of his or her dissertation committee, minus the external member), meeting in closed session, normally on a topic relevant to the student's dissertation research. This presentation must be made within one year and one semester after a student passes the written examination. A request for extension of the deadline must be made in writing to the Graduate Program Committee.

A student's dissertation advisor, in consultation with the student, may choose from two possible formats for this presentation:

1. a presentation by the student directly on his or her dissertation research or
2. a presentation on a specific topic that the student has been assigned to investigate for several months.

For either option, the student must write a short paper of 10 or fewer pages on his or her presentation topic and give it to all members of the oral examination committee at least two weeks before the scheduled date of the examination. The committee, by majority vote, will determine whether the student passes or fails the oral examination. A student who fails the oral examination will be allowed a second attempt. The student's dissertation advisor will decide the format and timing of such a second attempt, with the provision that the second attempt must be completed within six months of the first attempt.

Teaching Requirement

Each candidate for the Ph.D. degree must earn a minimum of four teaching credits, which are defined in the following way:

- One such credit is awarded for teaching a one-hour recitation for one semester in the Department of Physics, and
- two such credits are awarded for teaching a one-semester laboratory course in the Department of Physics.

The graduate program director may approve the substitution of an equivalent amount of teaching experience in the Department of Physics for this requirement.

Dissertation

The dissertation is the final and most important requirement that must be completed by a candidate for the Ph.D. degree in physics. It must be based on original research in physics that makes a contribution to existing knowledge and be of sufficient quality and interest to merit publication in a refereed physics journal. Research that is classified by the U. S. Government (in a way that restricts its distribution) is not a suitable basis for a dissertation, as one essential characteristic of a dissertation is that its contents must be disseminated freely.

The candidate's dissertation research is supervised generally by his or her dissertation committee. Close supervision is provided by the candidate's research advisor, who is a member of the dissertation committee and may be a tenured, tenure-track, research, or adjunct member of the graduate-certified faculty of the Department of Physics. If the research advisor is a tenured or tenure-track member of the faculty, he or she is the chair of the candidate's dissertation committee. If the research advisor is an adjunct or research faculty member, a tenured or tenure-track graduate-certified faculty member must serve as co-advisor and also serve as chair of the dissertation committee. The dissertation committee is composed of five members, a majority of whom must be tenured or tenure-track members of the graduate-certified faculty of the Department of Physics and one of whom must be a tenured or tenure-track faculty member of the graduate-certified faculty in a department of Old Dominion University other than the Department of Physics. It is the responsibility of the research advisor and the candidate to nominate prospective members for the dissertation committee to the graduate program director, who must formally approve the membership of the dissertation committee.

The format of the dissertation is specified by the Guide for Preparation of Theses and Dissertations, and variations allowed within the Department of Physics are specified by the graduate program director.

Dissertation Defense

The final examination that a candidate must pass in order to receive the Ph.D. is an oral examination by the dissertation committee based on the candidate's public presentation of the results contained in his or her dissertation. This defense is conducted in two phases:

1. a public presentation in front of the dissertation committee that is open to any person who may wish to attend and direct relevant questions to the candidate and
2. a closed session between the candidate and the dissertation committee in which the candidate is questioned further by that committee.

The dissertation committee determines by majority vote whether the candidate passes or fails this final oral defense. If the candidate fails, he or she is allowed only one additional attempt to pass at a later time.

Applied Physics Endorsement

Students that are interested in the Applied Physics Endorsement should contact the graduate program director for more information.

Department of Psychology

Mills Godwin Bldg
Norfolk, VA 23529

James Bliss, Chair

Graduate Study

The Department of Psychology offers a program of study leading to the degree of Master of Science with a major in psychology and programs leading to the Doctor of Philosophy with majors in applied experimental psychology, human factors psychology and industrial/organizational psychology.

The department also participates in a program leading to the degree of Doctor of Philosophy in clinical psychology. This program, under the direction of the Virginia Consortium Program in Clinical Psychology, is a joint venture of the Departments of Psychology at Old Dominion University and Norfolk State University and the Department of Psychiatry and Behavioral Sciences at Eastern Virginia Medical School.

Master of Science - Psychology

Matt Henson, Graduate Program Director

The master's program in psychology offers a course of study leading to the Master of Science with a major in general psychology. The master's degree program is appropriate for students wishing to enter a doctoral program at Old Dominion or another university or for those seeking the master's as a terminal degree. The curriculum is designed to provide a strong background in research methods and general psychology so that the student will have a wide range of choices for future professional development.

Graduate students are encouraged to work closely with members of the faculty and to participate in the research and other professional activities that are available within the department. Faculty are involved in research in the general areas of clinical, social, health, developmental, human factors, organizational, personnel, and community psychology. Currently, faculty and students are engaged in research projects on various topics including: personal relationships, coping with discrimination and bias, parenting, work-family conflict, driving behaviors, predictors and interventions for substance abuse and health risk behaviors, hindsight bias, response to alarms, medical modeling and simulation, telework, training of women and minorities in STEM fields, and internet-based training and education.

Admission

To qualify for admission, a candidate must meet the general university admission requirements. In addition, the candidate must present:

1. undergraduate courses in statistics and research methods and nine additional hours in psychology;
2. official scores on the aptitude section of the Graduate Record Examination (GRE) (applicants who do not have a bachelor's degree in psychology must also take the advanced psychology GRE test); and
3. transcripts of all undergraduate and graduate work.

A brief statement by the student outlining personal goals and academic objectives and three letters of reference (at least two of which are from former college or university teachers) are requested. All credentials in support of applications should be sent to the Office of Admissions.

Requirements

To qualify for the Master of Science in psychology, a student must meet the following requirements:

1. The student must maintain a B average (3.00 on a 4.00 scale) in a minimum of 36 hours of course work.
2. The student is required to successfully complete a core of courses established by the faculty with at least a B (3.00) average in these courses. The core courses consist of the following:

PSYC 713	Research Fundamentals	2
PSYC 727 & PSYC 728	Analysis of Variance and Experimental Design and Regression and Correlational Design	8
PSYC 731 or PSYC 741	Human Cognition Sensation and Perception	3
PSYC 651 or PSYC 749	Developmental Psychology Advanced Social Psychology	3
Total Hours		16

Completion of the core is a prerequisite for beginning work on the thesis (including registration for PSYC 698 and PSYC 699). Full-time students must complete the core courses in the first year, and part-time students must do so in the first two years.

In addition to completing the core requirements, students must complete a total of 30 hours of course work plus 6 hours of research and thesis. Prior to beginning the thesis research, the student will submit a request to the graduate program director to form a thesis committee. The student will identify two members of the committee and the GPD will appoint the third member. When the student has completed the research, a written thesis must be submitted to the thesis committee. Completion of the thesis depends on acceptance of the thesis by the thesis committee and the graduate program director, as well as passing an oral exam in a public defense of the thesis.

To maintain their standing in the program students must demonstrate progress toward completing degree requirements, i.e., enrollment and satisfactory performance in courses during the FA and SP semesters. Students who have completed all course work and are working on their thesis must register for PSYC 999 (one credit) in FA and SP semesters continuously until graduation. The graduate catalog requires students who are utilizing university resources or consulting with faculty to be registered for a minimum of one credit. Students who fail to register for one credit may be terminated from the program in at the end of the semester in which they failed to register.

If students have not completed their thesis by the end of their third year, they must submit a plan to their advisor and the GPD outlining target dates for completing the various elements of the thesis. Students may be terminated from the program if they fail to meet their target dates.

Students will not be allowed to validate courses that are older than six years. They must retake the course(s), or an alternative course that meets the current requirements, that have exceeded the six year limit.

Areas of Concentration

Students receiving a master's degree in psychology may choose to concentrate their studies in one of four possible areas. The student must complete 12 credit hours in courses relevant to the area and maintain a

minimum GPA of 3.00 in those courses. Course credit hours to fulfill the core requirements may not be used toward an area of concentration. The following is a list of the four areas and relevant courses for each area.

Applied Cognitive Psychology

Required

Only 3 credit hours count toward area of concentration		3
PSYC 731	Human Cognition	3
PSYC 741	Sensation and Perception	3

Other relevant courses

PSYC 651	Developmental Psychology	3
PSYC 663	Intellectual Assessment	3
PSYC 749	Advanced Social Psychology	3
PSYC 770	Human Factors Psychology	3
PSYC 792	Advanced Seminar in Physiological Psychology	3

Clinical Psychology

Required

Select one of the following:		3
PSYC 661	Psychopathology	
PSYC 663	Intellectual Assessment	
PSYC 664	Personality Assessment	
Total Hours		3

Other relevant courses

PSYC 651	Developmental Psychology	3
PSYC 653	Personality Psychology: Theory and Research	3
PSYC 745	Psychometric Theory	3
PSYC 792	Advanced Seminar in Physiological Psychology	3

Industrial/Organizational Psychology

Required

Select two of the following:		6
PSYC 745	Psychometric Theory	
PSYC 750	Organizational Psychology	
PSYC 763	Personnel Psychology	
Total Hours		6

Other relevant courses

PSYC 749	Advanced Social Psychology	3
PSYC 836	Multilevel Models: HLM	3
PSYC 846	Structural Equation Modeling	3
PSYC 851	Micro Organizational Psychology	3
PSYC 853	Macro Organizational Psychology	3
PSYC 864	Human Resource Development	3
PSYC 865	Psychology of Personnel Selection	3
PSYC 867	Human Performance Assessment	3

Quantitative and Assessment

Required

PSYC 745	Psychometric Theory	3
Total Hours		3

Other relevant courses

PSYC 663	Intellectual Assessment	3
PSYC 664	Personality Assessment	3

PSYC 763	Personnel Psychology	3
PSYC 836	Multilevel Models: HLM	3
PSYC 846	Structural Equation Modeling	3

Courses not listed, but relevant to an area of concentration, may be used to fulfill the requirements for the area as approved by the student's advisor.

Doctor of Philosophy - Applied Experimental Psychology

Bryan Porter, Graduate Program Director

Admission

The graduate program in applied experimental (AE) psychology admits students at two levels: with a master's degree or with a bachelor's degree. Degrees held must be in psychology or a related field. Each applicant must submit:

1. Official scores on the General Test of the Graduate Record Examination (GRE); Applicants with degrees from fields outside psychology must also submit GRE scores for the Subject Test in psychology.
2. A brief statement outlining personal goals and academic objectives; three letters of reference, at least two of which are from former college/university teachers or research supervisors.
3. Transcripts of all prior academic work.
4. Applicants are encouraged to submit a writing sample.

Overview of Topical Areas

The AE program is designed to provide:

1. Broad doctoral training firmly based on psychological theory and basic behavioral science;
2. Great depth of knowledge broadly spread over the fundamental areas of experimental psychology; and
3. Concentration in an area of experimental psychology for applied settings.

The general philosophy and plan of the AE psychology program at Old Dominion University is to provide graduate training consisting of four phases:

1. A core of basic psychology, acquired primarily at the master's level;
2. In-depth training in statistics, methodology, and grant and manuscript writing;
3. Research experience in a field of AE psychology; and
4. Completion of a dissertation representing a significant contribution to AE psychology. For example, two research fields with which numerous faculty members are involved are health psychology and developmental psychology.

Requirements

The Ph.D. degree in AE requires at least 84 semester hours of credit beyond the bachelor's degree or at least 48 semester hours of post-master's training. Students entering the program with a bachelor's degree must complete the first phase of the program by meeting the requirements for the master's degree in general psychology (i.e., 36 semester hours with appropriate course work). For the student with a bachelor's degree, completion of the program requires approximately five years of study. For the student who holds the master's degree upon entering the Ph.D. program, completion requires approximately three years. The student is required to complete a core of master's-level courses with at least a B average.

The core courses consist of the following:

PSYC 813	Research Project I	2
PSYC 827	Analysis of Variance and Experimental Design	4
PSYC 828	Regression and Correlational Design	4
PSYC 845	Psychometric Theory	3

Select one of the following:		3
PSYC 651	Developmental Psychology	
PSYC 849	Advanced Social Psychology	
Select one of the following:		3
PSYC 831	Human Cognition	
PSYC 841	Sensation and Perception	
Total Hours		19

Attaining the master's degree requires two years of study.

Following the master's degree requirements, the student forms a guidance committee of graduate faculty members who assist in developing a plan of study tailored to the student's needs and interests. The plan of study outlines the minimum of 48 hours of post-master's training, including:

1. Completion of the remaining required course (PSYC 833, Grant and Manuscript Writing);
2. Completion of one additional quantitative course (3 credits);
3. Maintenance of a strong focus in research methods and statistics;
4. Completion of supplementary courses to support the chosen specialty (e.g., health-related courses to be taken by health specialists); and
5. Development of a viable research program.

Candidacy Examination

Prior to admission to candidacy (i.e., the beginning of formal work on the dissertation), each student is required to pass a written and oral candidacy examination. There are two options for this requirement.

1. Qualifying Exam: questions assess
 - a. Core experimental psychology (statistics, methodology, experimental principles, ethics; four hours) and a specialty area (research program and relevant content knowledge; eight hours).
 - b. An oral examination follows the written, during which the student defends answers to the written components (two hours).
2. Major Area Paper
 - a. A review paper (quantitative or qualitative) or theoretical analysis of a research area designated by the student as an important area for contemporary applied experimental psychology.
 - b. The resulting paper should define the student as an expert in that area, and be of publishable quality.
 - c. The student must defend the work to the guidance committee, and submit the work for publication in a journal relevant to the student's research specialty, as a book chapter, or as an approved grant proposal before this option is passed.

Research Emphasis

A major objective of the AE psychology program is to provide the student with substantial experience in planning, designing, conducting, and reporting results of independent research. Toward this end, a student is expected to engage in a variety of research activities. This expectation is reflected in the program's few traditional classroom course requirements beyond the master's degree. The time should be spent on mostly research-related activities (e.g., reading, individual study [research], and dissertation). The student is expected to acquire research experiences that go well beyond formal course requirements. These research experiences may take a variety of forms and occur in a variety of settings. For example, the student is encouraged to engage in both laboratory and field research related to the AE specialty, to serve as a member of a larger research team when appropriate or available (perhaps serving as a graduate research assistant on an externally sponsored grant), and to engage in independent non-sponsored research. The student is also encouraged to seek out opportunities to conduct research projects (including grants and contracts funded through the Old Dominion University Research Foundation) on his or her own and in collaboration with faculty members. The accumulation of these research experiences should result in presentation of papers at professional meetings, the publication of manuscripts in refereed journals, the publication of technical reports, and the submission of grant/contract proposals.

Graduate Student Teaching

Teaching a course is an experience that is worthwhile regardless of the eventual career role(s) that a student envisions, and the experience should be taken seriously for its professional value. Benefits associated with teaching a course include expanding and solidifying knowledge about general and AE psychology, polishing communication skills, and establishing professional identification. Although there are other ways to acquire these benefits (e.g., presentations at conferences, consulting experiences, organizing and conducting workshops), teaching a course systematically builds these experiences into a student's plan of study. Moreover, any student who plans an academic career should teach one or more courses in preparation for that career. The student should also recognize that during the course of graduate training, financial support is often provided by the Psychology Department from graduate teaching assistant or adjunct teaching funds. This type of financial support almost always requires that the student be partially or fully responsible for teaching a course. Department policy now requires students to enroll in and complete Teaching of Psychology (PSYC 815) before being allowed to teach a course as the sole, responsible instructor.

Dissertation

The doctoral dissertation must represent an achievement in research and a significant contribution to knowledge in the major area of study. It is equivalent to no more than 24 semester hours of course work.

Dissertation Defense

An oral examination in defense of the dissertation is required. The aim of the defense is to explore with the candidate the methodological and substantive contributions of the completed dissertation.

Research Opportunities

AE faculty conduct numerous research projects on health and public health, quantitative, cognitive, developmental, social, and ethics topics. Students have access to laboratory facilities as well as field settings in which faculty work. Research is supported by a variety of funding agencies from federal (including the National Institutes of Health) to state agencies. Students are encouraged to become engaged in one of these research programs early in the process of their education.

Doctor of Philosophy - Human Factors Psychology

Bryan Porter, Graduate Program Director

Admission

The graduate program in human factors (HF) psychology, accredited by the Human Factors and Ergonomics Society, admits students with bachelor's or master's degrees from psychology or related fields. Each applicant must submit:

1. Official scores from General Test of the Graduate Record Examination (GRE). Applicants with degrees from fields outside psychology must also submit GRE scores for the Subject Test in psychology.
2. A brief statement by the student outlining the prospective student's personal goals and academic objectives.
3. Three letters of reference, at least two of which are from former college or university teachers.
4. Transcripts of all prior academic work including grades for experimental methods and statistics courses or equivalent.
5. Applicants are also encouraged to submit a writing sample.

Overview of the Topical Areas

The HF doctoral program follows the scientist-practitioner model with emphasis on psychological theory and behavioral science, statistics and research methodology, practical experience, and fundamental and innovative areas of human factors/engineering psychology. The following is a partial list of these areas:

aviation psychology
behavioral modeling

complex system operation
display design
driving and navigational performance
ergonomics
human-computer interaction
perception and performance
medical systems
neuroergonomics
simulation
team performance
training
usability testing
warnings and alarms
virtual environments
information processing and workload

Requirements

The program requires at least 84 semester hours of credit beyond the bachelor's degree with at least 48 hours being post-master's education. For the individual entering with a bachelor's degree, the general plan of graduate education consists of four phases:

1. A core of basic psychology, acquired while working toward the master's degree;
2. Broad education in the general area of human factors psychology;
3. Research and applied experience in human factors psychology; and
4. Completion of a dissertation representing a significant professional contribution to human factors psychology.

For the individual entering with a master's degree, a minimum of 48 hours of doctoral-level credits is required, based on the faculty's and the Ph.D. program director's review of the student's educational background. Students who enter with a master's degree will typically pursue a plan of study identical in spirit to the latter three phases of the plan of study followed by a student entering with a bachelor's degree (see phases listed above). The student will form a guidance committee within the first year of entry. These are graduate faculty members who assist in developing the plan of study tailored to the student's needs and interests. This plan of study outlines the minimum 48 hours of post-master's education. For the student who holds the master's degree upon entering the Ph.D. program, completion will require approximately three years.

For the student with a bachelor's degree, completion of the program requires approximately five years of study. A student entering the program with a bachelor's degree must complete the first phase of the program by meeting the requirements for the master's degree in general psychology (i.e., 36 semester hours with appropriate course work). The student is required to complete successfully a core of master's-level courses, with at least a B average in these courses.

The core courses consist of the following:

PSYC 813	Research Project I	2
PSYC 827	Analysis of Variance and Experimental Design	4
PSYC 828	Regression and Correlational Design	4
PSYC 831	Human Cognition	3
PSYC 841	Sensation and Perception	3
Select one of the following:		3
PSYC 651	Developmental Psychology	
PSYC 849	Advanced Social Psychology	
Total Hours		19

Completion of the first phase requires two years of study. Following the student's second year, the student forms a guidance committee of graduate faculty members who assist in developing a plan of study tailored to the student's needs and interests. The plan of study outlines the student's minimum 48 hours of post-master's education.

Candidacy Examination

Prior to admission to candidacy (i.e., the beginning of formal work on the dissertation), each student is required to pass a qualifying examination covering the breadth of the general HF discipline as well as the student's primary area of concentration. The examination consists of a written part (eight hours) and an oral part (two hours).

Publication and Application

Prior to graduation, students are required to demonstrate their ability to assume first authorship in a refereed journal, and to create an application of research methodology and/or computing skills. An example of such an application might include a data analysis program, a simulation program or a patentable technology innovation.

Practical Experience

The student must obtain professional practice experiences during the course of graduate education. An internship is one excellent option for meeting this requirement. However, the student can also meet the requirement by participating in at least two applied research projects or consulting activities under the direct supervision of a Ph.D. psychologist (or psychologists). The student's guidance committee establishes the criteria for meeting the professional-practice experience requirement and judges the adequacy of the experiences.

Graduate Student Teaching

Teaching a course is an experience that is worthwhile regardless of the eventual career role(s) that a student envisions, and the experience should be taken seriously for its professional value. Benefits associated with teaching a course include expanding and solidifying knowledge about general and HF psychology, polishing communication skills, and establishing professional identification. Although there are other ways to acquire these benefits (e.g., presentations at conferences, consulting experiences, organizing and conducting workshops), teaching a course systematically builds these experiences into a student's plan of study. Moreover, any student who plans an academic career should teach one or more courses in preparation for that career. The student should also recognize that during the course of graduate training, financial support is often provided by the Psychology Department from graduate teaching assistant or adjunct teaching funds. This type of financial support almost always requires that the student be partially or fully responsible for teaching a course. Department policy now requires students to enroll in and complete Teaching of Psychology (PSYC 815 (<https://nextcatalog.odu.edu/graduate/collegeofsciences/psychology>)) before being allowed to teach a course as the sole, responsible instructor.

Dissertation

The doctoral dissertation must represent an achievement in research and a significant contribution to knowledge in the major area of study. It is equivalent to no more than 24 semester hours of course work.

Dissertation Defense

An oral examination in defense of the dissertation is required. The aim of the defense is to explore with the candidate the methodological and substantive contributions of the completed dissertation.

Research Opportunities

Lab facilities are available for research in cognition, human perception and performance, modeling and simulation, and psychophysiology. Facilities include personal computers, local area networked testing stations, sound-attenuated testing chambers, driving simulators, flight simulators, and a human-computer interaction laboratory. Access to university computing and multimedia development facilities is also available. To complement the program's emphasis on modeling and simulation, students also have access to the Virginia Modeling, Analysis and Simulation Center (VMASC). VMASC is an ODU-affiliated research and development center where scientists from a number of disciplines create and test computer models and simulation applications to benefit industrial, academic, and governmental interests.

Research is supported by private sector, local, state or federal governmental organizations (e.g., National Science Foundation, National Institutes of Health, NASA, etc.), or one of the military services. Doctoral students are encouraged to become engaged in one of these research programs early in the process of their education.

Doctor of Philosophy - Industrial/Organizational Psychology

Bryan Porter, Graduate Program Director

Admission

The Doctor of Philosophy (Ph.D.) program in industrial and organizational (I-O) psychology admits students with bachelor's or master's degrees from psychology or related fields. Each applicant must submit:

1. Official scores on the Graduate Record Examination including the verbal, quantitative, and analytical writing scores. Applicants with degrees from fields outside psychology must also submit GRE scores for the Subject Test in psychology;
2. A brief statement outlining the prospective student's personal goals and academic objectives;
3. A sample of recent academic writing (e.g., a paper required in an undergraduate course);
4. Three letters of reference, at least two of which are from former college or university teachers; and
5. Transcripts for all prior academic work.

Overview of the Topical Areas

The program covers current theoretical and practical issues and topics within I-O psychology. The following is a partial list of these areas:

Job analysis
Psychological testing
Selection systems
Personnel training
E-training
Human resource development
Human resource management
Occupational safety and health
Work motivation
Work-family interface
Job satisfaction
Organizational commitment
Leadership
Group and team processes
Organization development and change and perceived fairness in the workplace
New forms of work organization such as telework and virtual teams
International aspects of I-O psychology.

Requirements

The program requires at least 84 semester hours of credit beyond the bachelor's degree with at least 48 hours being post-master's education. Post-master's credits include up to 24 dissertation research credits. For the individual entering with a bachelor's degree, the general plan of graduate education consists of four phases:

1. Course work in general psychology, acquired while working toward the master's degree;
2. Broad education in the general area of I-O psychology;
3. Research and professional-practice experience in I-O psychology; and
4. Completion of a dissertation representing a significant professional contribution to I-O psychology.

For the individual entering with a master's degree, a minimum of 48 hours of doctoral-level credits is required, based on a review of the student's educational background by the faculty and the Ph.D. programs director. The entering student holding a master's degree must pursue a plan of study

identical in spirit to the latter three phases of the student with the bachelor's degree (see phases listed above).

For the student with a bachelor's degree, completion of the program requires approximately five years of study. For the student who holds the master's degree upon entering the Ph.D. program, completion requires approximately three years. A student entering the program with a bachelor's degree must meet the requirements for the master's degree in general psychology (i.e., 36 semester hours with appropriate course work). The student is required to complete a core of master's-level courses with at least a B average.

The core courses consist of the following:

PSYC 813	Research Project I	2
PSYC 827	Analysis of Variance and Experimental Design	4
PSYC 828	Regression and Correlational Design	4
PSYC 845	Psychometric Theory	3
PSYC 850	Organizational Psychology	3
PSYC 863	Personnel Psychology	3
Total Hours		19

Attaining the master's degree requires two years of study.

By November 1 of the third fall of study for a student entering with a bachelor's degree, or the first fall of study for a student entering with a master's degree, a plan of study must be prepared with the aid and approval of the academic mentor. The plan of study is then given to the Ph.D. programs director for approval. The plan of study outlines the student's minimum 48 hours of post-master's education. The student must include a plan to complete three of the following four courses: Micro-Organizational Psychology (PSYC 851); Macro-Organizational Psychology (PSYC 853); Human Resource Development (PSYC 864); and Psychology of Personnel Selection (PSYC 865). The student must also complete three other elective courses, one of which can be the fourth course taken from the previous list if the student chooses to complete all four.

Candidacy Examination

Prior to admission to candidacy (i.e., the beginning of formal work on the doctoral dissertation), each student is required to pass a candidacy exam. There are two methods a student might use to pass the candidacy exam:

1. The student publishes three manuscripts, at least one as first author, in peer-reviewed journals; or
2. The student completes a qualifying examination covering the student's areas of specialization. The candidate is examined broadly in the areas, not merely in a single aspect of concentration. The examination consists of a written part (12 hours) and an oral part (two hours).

Practical Experience

The student must obtain professional practice experiences during the course of graduate education. An internship is one excellent option for meeting this requirement. However, the student can also meet the requirement by active involvement in applied research or consulting activities under the direct supervision of one or more Ph.D. psychologists. The student's academic mentor establishes the criteria for meeting the professional-practice experience requirement and judges the adequacy of the experiences.

Graduate Student Teaching

Teaching a course is an experience that is worthwhile regardless of the eventual career role(s) that a student envisions, and the experience should be taken seriously for its professional value. Benefits associated with teaching a course include expanding and solidifying knowledge about general and I-O psychology, polishing communication skills, and establishing professional identification. Although there are other ways to acquire these benefits (e.g., presentations at conferences, consulting experiences, organizing and conducting workshops), teaching a course systematically builds these experiences into a student's plan of study. Moreover, any student who plans an academic career should teach one or more courses in preparation for that career. The student should also recognize that during the course of graduate

training, financial support is often provided by the Psychology Department from graduate teaching assistant or adjunct teaching funds. This type of financial support almost always requires that the student be partially or fully responsible for teaching a course. Department policy now requires students to enroll in and complete Teaching of Psychology (PSYC 815 (<https://nextcatalog.odu.edu/graduate/collegeofsciences/psychology/>)) before being allowed to teach a course as the sole, responsible instructor.

Dissertation

The doctoral dissertation is a significant and creative research achievement and a significant contribution to knowledge in I-O psychology. An oral examination in defense of the dissertation is required. The aim of the defense is to evaluate the doctoral candidate's mastery of the methodological and substantive contributions of the completed dissertation.

Research Opportunities

Laboratory and field research programs are conducted by the I-O faculty on such diverse topics as selection systems, training systems, development and implementation of performance appraisal systems, team performance and assessment, work-family interface, workplace diversity and inclusion, organizational change, occupational safety and health, innovation management, telework, virtual teams, and international I-O issues. Research is supported by a variety of agencies such as the National Science Foundation; National Institutes of Health; National Institute for Occupational Safety and Health; the NASA/Langley Research Center; the Virginia Modeling, Analysis and Simulation Center; and the military services. Students are encouraged to become engaged in one of these research programs early in the process of their education.

Doctor of Philosophy - Clinical Psychology

Robin Lewis, Graduate Program Director

The Department of Psychology participates in the Virginia Consortium Program in Clinical Psychology, a joint venture of the Departments of Psychology at Old Dominion University and Norfolk State University and the Department of Psychiatry and Behavioral Sciences at Eastern Virginia Medical School. The combined efforts of these institutions give considerable breadth and depth to this unique program. The emphasis of the program is on the training of highly skilled psychologists. The program uses a "scientist-practitioner" model that emphasizes a balanced integration of scientific and clinical training. Detailed information about the program is available at the program's website: <http://www.sci.odu.edu/vcpcp>.

Admission

Admission information is available at the program's website: <http://www.sci.odu.edu/vcpcp>. To be considered for admission to the Clinical Ph.D. program, an applicant must have a baccalaureate degree, an acceptable background in psychology, and clinical and research experience. A personal interview is also required.

The applicant must also submit:

1. Official scores on the Graduate Record Examination and transcripts of academic coursework.
2. The Consortium's supplemental application that includes: a. A personal statement outlining academic objectives and career goals and how the Virginia Consortium will assist in achieving these goals. b. A summary of clinical, research and teaching interests and experience. c. A resume or curriculum vitae.
3. Three letters of reference.

Degree Requirements

The Clinical Ph.D. program provides students with a high level of professional training. The program consists of a minimum of five years of post-baccalaureate training. The curriculum involves a specific sequence of required courses to ensure mastery of the knowledge and skills necessary for professional competence. The first two years (six semesters) provide for an intense program of basic behavioral science, a second-year research project, and clinical courses and practica. In the third and fourth years, students complete their advanced training practica and course work as well as an

empirical doctoral dissertation. The one-year full-time clinical internship is completed during the fifth year. The internship is not provided by the Virginia Consortium.

Student Evaluation

Students are regularly evaluated in both course work and practicum activities. A formal evaluation of student's progress is conducted annually. At the end of the first semester of the third year, each student is evaluated through a written and oral comprehensive examination that covers coursework and research and clinical competence.

Dissertation Award

The David Leigh Pancoast Award is given to the student in the Virginia Consortium Program in Clinical Psychology with the outstanding doctoral dissertation.

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Cherng-Jyh Yen (2014; 2008). Associate Professor of Educational Foundations and Leadership. B.S., Tung-Hai University (Taiwan); M.S., Indiana University; Ph.D., University of Virginia.

Steven A. Yetiv (2004; 1994). Professor of Political Science and Geography and Louis I. Jaffe Professor of Arts & Letters. B.A., M.A., University of Akron; Ph.D., Kent State University. Designated as a University Professor.

Brandon K. Yoder (2013; 2013). Assistant Professor of Political Science and Geography. B.S., Cornell University; M.A., Ph.D., University of Virginia.

Jaewan Yoon (2002; 1995). Associate Professor of Civil and Environmental Engineering. B.E., Dongguk University (South Korea); M.S., Ph.D., North Dakota State University. Designated as a University Professor.

Junji Yoshida (2012; 2012). Assistant Professor of Foreign Languages and Literatures. B.A., Kwasei Gakuin University (Japan); M.A., Kyushu University (Japan); Ph.D., University of Oregon.

Charlotte Young (2012; 2012). Lecturer, English Language Center. B.S., University of Surrey (United Kingdom); M.A., Old Dominion University.

Jennifer M. Younkin (2010; 2003). Senior Lecturer of Psychology. B.S., M.S., Old Dominion University.

Kenneth K. Yung (2001; 1989). Professor of Finance. B.Soc.Sci., University of Hong Kong (China); M.B.A., State University of New York at Buffalo; Ph.D., Georgia State University.

Juita-Elena Yusuf (2014; 2008). Associate Professor of Urban Studies and Public Administration. B.S., University of Notre Dame; M.B.A., Indiana University; Ph.D., University of Kentucky.

Elizabeth A. Zanoni (2011; 2011). Assistant Professor of History. B.A., University of Notre Dame; M.A., Western Michigan University; Ph.D., University of Minnesota - Minneapolis.

Alla P. Zareva (2013; 2009). Associate Professor of English. B.A., College of International Tourism (Bulgaria); M.A., Veliko Turnovo University (Bulgaria); Ph.D., University of Georgia.

Noam Zeev (2008; 2008). Assistant Professor of Mathematics and Statistics. B.S., Simon Bolivar University (Venezuela); Ph.D., University of Delaware.

Donald Jay Zeigler (1992; 1980). Professor of Political Science and Geography. B.S., Shippensburg State College; A.M., University of Rhode Island; Ph.D., Michigan State University.

Steven J. Zeil (1988; 1988). Associate Professor of Computer Science. B.A., Thomas More College; M.S., Ph.D., Ohio State University.

Dennis J. Zeisler (1999; 1979). Professor of Music. B.M., B.M.E., M.Mus., University of Michigan. Designated as a University Professor.

Christian W. Zemlin (2011; 2011). Assistant Professor of Electrical and Computer Engineering. B.Sc., M.Sc., Technical University of Berlin (Germany); Ph.D., Humboldt University (Germany).

Jing Zhang (2012; 2012). Assistant Professor of Management. B.A., M.A., Renmin University (China); Ph.D., National University of Singapore.

Qi (Harry) Zhang (2011; 2005). Associate Professor of Community and Environmental Health. B.A., Fudan University (China); M.A., Ph.D., The University of Alabama.

Weiyong Zhang (2012; 2012). Assistant Professor of Information Technology/Decision Sciences. B.S., M.S., Fudan University (China); Ph.D., University of Minnesota - Minneapolis.

Xiaoyu Zhang (2013; 2013). Assistant Professor of Mechanical and Aerospace Engineering. B.S., M.S., Nanjing University of Aeronautics and Astronautics (China); Ph.D., University of Connecticut.

Haiwen Zhou (2009; 2002; 2005). Associate Professor of Economics. B.A., Nankai University (China); M.A., Zhongshan University (China); Ph.D., University of Maryland - College Park.

Ruhai Zhou (2009; 2004). Associate Professor of Mathematics and Statistics. B.S., M.S., Nanjing University (China); Ph.D., University of New Mexico.

Xihe Zhu (2009; 2009). Assistant Professor of Human Movement Sciences. B.Ed., M.Ed., Shanghai Institute of Physical Education (China); Ph.D., University of Maryland – College Park.

Douglas E. Ziegenfuss (2001; 1988). Professor of Accounting. B.A., Mount Saint Mary's College; M.S., American University; Ph.D., Virginia Commonwealth University; C.P.A., C.M.A., C.I.A.

Richard C. Zimmerman (2003; 2003). Professor of Ocean, Earth, and Atmospheric Sciences. B.S., M.S., Ph.D., University of Southern California.

Mohammad Zubair (2002; 1987). Professor of Computer Science. B.S., Delhi University (India); Ph.D., Indian Institute of Technology (India).

Michael T. Zugelder (2011; 1995). Professor of Finance. B.A., M.B.A., Indiana University; J.D., University of Toledo. Designated as a University Professor.

* The listing reflects the faculty as of June 1, 2014. The dates in parentheses indicate the following: the first date, the year in which the present rank was attained; the second date, the year when the individual was first appointed to the faculty; a third date, the year of reappointment.

Faculty Emeriti

Faculty Emeriti

Cephas J. Adkins, *Professor Emeritus of Psychology*

Abdel M. Agami, *Professor Emeritus of Accounting*

Robert Ake, *University Professor Emeritus and Associate Professor Emeritus of Chemistry and Biochemistry*

Dwight Allen, *Eminent Scholar Emeritus of Educational Reform and Professor Emeritus*

Betty Alexy, *Associate Professor Emerita of Nursing*

Claire J. Anderson, *Associate Professor Emerita of Management*

Michael C. Andrews, *Eminent Scholar Emeritus and Louis I. Jaffe Professor Emeritus of English*

Steven K. Atiyah, *Assistant Professor Emeritus of Mathematics and Statistics*

Roy E. Aycock, *Professor Emeritus of English*

William Bartolotta, *Associate Professor Emeritus of Music*

Nancy Topping Bazin, *Eminent Scholar Emerita and Professor Emerita of English*

Jacob Becher, *Associate Professor Emeritus of Physics*

Charles E. Bell, *Professor Emeritus of Chemistry and Biochemistry*

Maurice Berube, *Eminent Scholar Emeritus and Professor Emeritus of Educational Leadership*

Samuel Bieber, *Professor Emeritus of Biological Sciences*

Frank W. Billmyer, *Professor Emeritus of Chemical Sciences*

Carl Boyd, *Eminent Scholar Emeritus and Louis I. Jaffe Professor Emeritus of History*

Colin Box, *Professor Emeritus of Community and Environmental Health*

William Brown, *Professor Emeritus of Educational Curriculum and Instruction*

Violet Breneiser, *Assistant Professor Emerita of Foreign Languages and Literatures*

John P. Broderick, *University Professor Emeritus and Professor Emeritus of English*

Katherine T. Bucher, *Professor Emerita of Educational Curriculum and Instruction*

James L. Bugg, *President Emeritus and Eminent Professor Emeritus of History*

Charles O. Burgess, *Professor Emeritus of English*

Leslie G. Carr, *Associate Professor Emeritus of Sociology and Criminal Justice*

Marion Carroll, *Assistant Professor Emeritus of Exercise Science, Physical Education and Recreation*

Keith A. Carson, *Associate Professor Emeritus of Biological Sciences*

Thomas R. Cash, *Professor Emeritus of Psychology*

Wilkie Chaffin, *Professor Emeritus of Information Systems and Decision Sciences*

Robert Y. Cheng, *Professor Emeritus of Civil Engineering*

Kwang S. Choi, *Associate Professor Emeritus of Finance*

Kae H. Chung, *Professor Emeritus of Management*

Allen K. Clark, *Professor Emeritus of Chemistry and Biochemistry*

Forrest P. Clay Jr., *Professor Emeritus of Physics*

Glynn Coates, *Professor Emeritus of Psychology*

Charlie H. Cooke, *Professor Emeritus of Mathematics and Statistics*

Gary E. Copeland, *Professor Emeritus of Physics*

James L. Cox, Jr., *Professor Emeritus of Physics*

Edward M. Cross, *Professor Emeritus of Information Systems/Decision Sciences*

Ernest J. Cross, Jr., *Professor Emeritus of Aerospace Engineering*

Gary R. Crossman, *Professor Emeritus of Engineering Technology*

William H. Crouch, *Associate Professor Emeritus of Information Technology and Decision Sciences*

Jon R. Crunkleton, *Associate Professor Emeritus of Finance*

Gabriel T. Csanady, *Professor Emeritus of Oceanography*

Frederick W. Culpepper, *Professor Emeritus of Occupational and Technical Studies*

William G. Cunningham, *Eminent Scholar Emeritus and Professor Emeritus of Educational Leadership and Counseling*

Stephen G. Cupschalk, *Associate Professor Emeritus of Mechanical Engineering*

Ram C. Dahiya, *Eminent Scholar Emeritus and Professor Emeritus of Mathematics and Statistics*

Joseph C. Daniel, *Professor Emeritus of Biological Sciences and Dean Emeritus of the College of Sciences*

Walter F. Deal, III, *Associate Professor Emeritus of Occupational and Technical Studies*

Elizabeth S. DeBedts, *Associate Professor Emerita of Library Science*

Amin N. Dharamsi, *Professor Emeritus of Electrical and Computer Engineering*

Terry L. Dickinson, *Professor Emeritus of Psychology*

Leonard E. Dobrin, *Associate Professor Emeritus of Sociology and Criminal Justice*

Lynn Doyle, *Associate Professor Emerita of Education Leadership*

Chris Drake, *Professor Emerita of Political Science and Geography*

William A. Drewry, *Professor Emeritus of Civil and Environmental Engineering*

Perry M. Duncan, *Associate Professor Emeritus of Psychology*

Thomas H. Dunham, *Associate Professor Emeritus of Ocean, Earth and Atmospheric Sciences*

William Dunstan, *Professor Emeritus of Ocean, Earth and Atmospheric Sciences*

John L. Echternach, *Eminent Scholar Emeritus of Physical Therapy*

Natalie W. Etheridge, *Associate Professor Emerita of Health, Physical Education and Recreation*

John A. Fahey, *Associate Professor Emeritus of Foreign Languages and Literatures*

Joong Fang, *Professor Emeritus of Philosophy*

Anita C. Fellman, *Professor Emerita of History*

Lewis S. Ford, *Louis I. Jaffe Professor Emeritus of Humanities and Professor Emeritus of Philosophy and Religious Studies*

Stephen Foster, *Professor Emeritus of Foreign Languages and Literatures*

Willard C. Frank, *Professor Emeritus of History*

Mark Fravel, *Professor Emeritus of Educational Curriculum and Instruction*

Frederick G. Freeman, *Professor Emeritus of Psychology*

Justin C. Friberg, *Professor Emeritus of Political Science and Geography*

Ann E. Gargett, *Professor Emerita of Ocean, Earth and Atmospheric Sciences*

Glenn A. Gerdin, *Associate Professor Emeritus of Electrical and Computer Engineering*

Philip S. Gillette, *Associate Professor Emeritus of Political Science and Geography*

Billy J. Gilpin, *Associate Professor Emeritus of Mathematics and Statistics*

Albert S. Glickman, *Eminent Professor Emeritus of Psychology*

Albert I. Godden, *Associate Professor Emeritus of Mechanical Engineering Technology*

Fred W. Granger, *Associate Professor Emeritus of Information Technology and Decision Sciences*

William H. Graves, *Professor Emeritus of Counseling and Human Services and Dean Emeritus of the Darden College of Education*

David R. Hager, *Professor Emeritus of Political Science and Higher Education Administration*

Jane M. Hager, *Professor Emerita of Teaching and Learning*

Jean Halladay, *Associate Professor Emerita of English*

Hiroyuki Hamada, *Associate Professor Emeritus of Exercise Science, Sport, Physical Education and Recreation*

William J. Hanna, *Professor Emeritus of Geophysical Sciences*

Richard F. Harrington, *Associate Professor Emeritus of Engineering Technology*

D. Alan Harris, *Associate Professor Emeritus of History*

R. Baine Harris, *Eminent Professor Emeritus of Philosophy and Religious Studies*

Thomas L. Harris, *Professor Emeritus of Educational Leadership and Counseling*

Harold G. Hawn, *Professor Emeritus of Music*

Alex Hawryluk, *Professor Emeritus of Management*

John Heinbockel, *Professor Emeritus of Mathematics and Statistics*

Paul L. Heine, *Associate Professor Emeritus of Exercise Science, Sport, Physical Education and Recreation and Associate Dean Emeritus of the Darden College of Education*

Carl O. Helvie, *Professor Emeritus of Nursing*

Erlene Hendrix, *Associate Professor Emerita of Communication and Theatre Arts*

James D. Hendry, *Associate Professor Emeritus of Electrical Engineering Technology*

Elizabeth S. Henry, *Associate Professor Emerita of Psychology*

Louis H. Henry, *Professor Emeritus of Economics and Dean Emeritus of the Honors College*

Carol F. Hines, *Associate Professor Emerita of Art*

Carole P. Hines, *Associate Professor Emerita of English*

S. Philip Hines Jr., *Associate Professor Emeritus of English*

John F. Holley, *Associate Professor Emeritus of Foreign Languages and Literatures*

John Holsinger, *Eminent Scholar Emeritus and Professor Emeritus of Biological Sciences*

Paul J. Homsher, *Professor Emeritus of Biological Sciences*

Clare Houseman, *Associate Professor Emerita of Nursing*

Ian D. Howard, *Professor Emeritus of Physics*

Gilbert R. Hoy, *Eminent Scholar Emeritus and Professor Emeritus of Physics*

Jesse W. Hughes, *Professor Emeritus of Accounting*

James Jarrett, *Professor Emeritus of Human Movement Sciences*

Beverley B. Johnson, *Associate Professor Emerita of Health, Physical Education and Recreation*

David E. Johnson, *Associate Professor Emeritus of Art*

Roger A. Johnson, *Associate Professor Emeritus of Educational Curriculum and Instruction*

Ronald E. Johnson, *University Professor Emeritus and Associate Professor Emeritus of Ocean, Earth and Atmospheric Sciences*

William B. Jones, *Associate Professor Emeritus of Philosophy and Religious Studies*

David I. Joyner, *Professor Emeritus of Educational Curriculum and Instruction*

Kenneth Karloff, *Assistant Professor Emeritus of Educational Curriculum and Instruction*

Allan H. Kaufman, *Associate Professor Emeritus of Occupational and Technical Studies*

Richard K. Keplar, *Associate Professor Emeritus of Engineering Technology*

Robert L. Kernell, *Professor Emeritus of Physics*

Govind S. Khandelwal, *Professor Emeritus of Physics*

Raymond H. Kirby, *Professor Emeritus of Psychology*

Paul W. Kirk, *Professor Emeritus of Biological Sciences*

Karl F. Knight, *Professor Emeritus of English*

Carl F. Koch, *Professor Emeritus of Geological Sciences*

John W. Kuehl, *Associate Professor Emeritus of History*

Harry S. Kuper, *Associate Professor Emeritus of Chemistry and Biochemistry*

Ralph V. LaHaie, *Professor Emeritus of Speech Communication and Theater Arts*

Mark Lesley, *Associate Professor Emeritus of Mathematics and Statistics*

Gerald Levy, *Professor Emeritus of Biological Sciences*

Linda Lane Lilley, *Associate Professor Emerita of Nursing*

Elizabeth Lipsmeyer, *Associate Professor Emerita of Art*

Christopher W. Lovell, *Associate Professor Emeritus of Educational Leadership and Counseling*

Cameron A. Lowe, *Associate Professor Emeritus of Dental Hygiene and Dental Assisting*

James G. Luton, *Professor Emeritus of Dental Hygiene*

Robert H. MacDonald, *Professor Emeritus of Educational Curriculum and Instruction*

Jean A. Major, *University Librarian Emerita*

Harold G. Marshall, *Morgan Professor Emeritus and Professor Emeritus of Biological Sciences*

Otto B. Martinson, *Professor Emeritus of Accounting*

A. Warren Matthews, *Professor Emeritus of Philosophy and Religious Studies*

R. Bruce McAfee, *Professor Emeritus of Management*

Vernon A. McCart, *Fine and Performing Arts Reference Librarian and Librarian III Emeritus*

Richard C. McCleary, *Professor Emeritus of Philosophy and Religious Studies*

Timothy C. McKee, *Associate Professor Emeritus of Accounting*

James J. McNally, *Professor Emeritus of English*

Griffith J. McRee, *Associate Professor Emeritus of Electrical and Computer Engineering*

John R. McSweeney, *Professor Emeritus of Educational Leadership and Counseling*

Chuh Mei, *Eminent Scholar Emeritus and Professor Emeritus of Aerospace Engineering*

Regula A. Meier, *Associate Professor Emerita of Foreign Languages and Literatures*

Robert F. Michel, *Associate Professor Emeritus of Engineering Technology*

Peter J. Mikulka, *Professor Emeritus of Psychology*

Taj O. Mohieldin, *Professor Emeritus of Engineering Technology*

Raymond F. Morgan, *Professor Emeritus of Educational Curriculum and Instruction*

Ula K. Motekat, *Professor Emerita of Accounting*

G. E. Mullin, *Professor Emeritus of Economics*

Ali Nowroozi, *Professor Emeritus of Ocean, Earth and Atmospheric Sciences*

George F. Oertel, *Professor Emeritus of Ocean, Earth and Atmospheric Sciences*

Donald Ogdon, *Professor Emeritus of Psychology*

C. Michael Overstreet, *Associate Professor Emeritus of Computer Science*

Allan Owen, *Associate Professor Emeritus of Music*

Richard A. Palmer, *Assistant Professor Emeritus of Chemistry and Biochemistry*

Elizabeth G. Pappas, *Associate Professor Emerita of Music*

William W. Patterson Jr., *Associate Professor Emeritus of Information Systems and Decision Sciences*

Leland D. Peterson, *Professor Emeritus of English*

Victor A. Pickett, *Professor Emeritus of Art*

Norman H. Pollock, *Associate Professor Emeritus of History*

W. Maurice Pritchard, *Professor Emeritus of Physics*

Harold J. Protsman, *Professor Emeritus of Music*

Anthony J. Provenzano, *Professor Emeritus of Ocean, Earth and Atmospheric Sciences*

Philip Raisor, *Professor Emeritus of English*

John W. Ramsey, *Professor Emeritus of Political Science*

Anne Raymond-Savage, *Associate Professor Emerita of Educational Curriculum and Instruction and Vice Provost Emerita for Distance Learning*

William T. Reece, *Professor Emeritus of Accounting*

Lindsay Rettie, *Professor Emerita of Dental Hygiene and Dental Assisting and Dean Emerita of the College of Health Sciences*

Carolyn H. Rhodes, *Professor Emerita of English and Women's Studies*

Ernest L. Rhodes, *Professor Emeritus of English*

John H. Richardson, *Associate Professor Emeritus of Biological Sciences*

Roger S. Richman, *Professor Emeritus of Urban Studies and Public Administration*

Betty R. Ricks, *Associate Professor Emerita of Management*

A. Sidney Roberts Jr., *Professor Emeritus of Mechanical Engineering*

Alfred B. Rollins Jr., *President Emeritus and Professor Emeritus of History*

Robert K. Rose, *Professor Emeritus of Biological Sciences*

Helen C. Rountree, *Professor Emerita of Anthropology*

Thomas C. Royer, *Eminent Scholar Emeritus and Slover Professor Emeritus of Ocean, Earth and Atmospheric Sciences*

Leonard I. Ruchelman, *Eminent Scholar Emeritus and Professor Emeritus of Urban Studies and Public Administration*

Murray Rudisill, *Professor Emeritus of Educational Curriculum and Instruction*

Joseph H. Rule, *Professor Emeritus of Ocean, Earth and Atmospheric Sciences*

Richard A. Rutyna, *Associate Professor Emeritus of History*

Annabel L. Sacks, *Director of Student Services Emerita*

Allen G. Sandler, *Associate Professor Emeritus of Early Childhood, Speech-Language Pathology and Special Education*

Kehar S. Sangha, *Professor Emeritus of Economics*

Clifford C. Saunders, *Professor Emeritus of Sociology*

Judith S. Schapiro, *Professor Emerita of Child Study and Special Education*

Henry Schmoele Jr., *Associate Professor Emeritus of Vocational and Technical Education*

Reiko M. Schwab, *Associate Professor Emerita of Educational Leadership and Counseling*

Karl H. Schoenbach, *Eminent Scholar Emeritus and Professor Emeritus of Electrical and Computer Engineering*

Ann V. Schwarz-Miller, *Associate Professor Emerita of Economics*

Joseph C. Sever, Jr., *Associate Professor Emeritus of Communication Disorders and Special Education*

William W. Seward, *Professor Emeritus of English*

Stephen P. Shao, *Professor Emeritus of Management Information Systems and Decision Sciences*

Stewart N. T. Shen, *Professor Emeritus of Computer Science*

David L. Shores, *Professor Emeritus of English*

J. Taylor Sims, *Professor Emeritus of Marketing*

Charles M. Smith, *Associate Professor Emeritus of Educational Curriculum and Instruction*

Theodore F. Smith, *Associate Professor Emeritus of Marketing*

Ronald W. Snapp, *Associate Professor Emeritus of Art*

Petra Snowden, *Associate Professor Emerita of Educational Leadership and Counseling*

Daniel Sonenshine, *Professor Emeritus of Biological Sciences*

Randall S. Spencer, *Professor Emeritus of Ocean, Earth and Atmospheric Sciences*

Ulysses Van Spiva, *Professor Emeritus of Educational Leadership and Counseling and Dean Emeritus of the Darden College of Education*

William D. Stanley, *Eminent Professor Emeritus of Engineering Technology*

Peter C. Stewart, *Associate Professor Emeritus of History*

John W. Stoughton, *Professor Emeritus of Electrical and Computer Engineering*

Raymond S. Strangways, *Professor Emeritus of Economics*

Cynthia Wright Swaine, *Instructional Services Librarian Emerita*

James R. Sweeney, *Associate Professor Emeritus of History*

John J. Swetits, *Professor Emeritus of Mathematics and Statistics*

J. Albert Tatem Jr., *Associate Professor Emeritus of Health, Physical Education, and Recreation*

William H. Thornton, *Associate Professor Emeritus of Engineering Technology*

Shunichi Toida, *Associate Professor Emeritus of Computer Science*

Alfred Townsend, *Associate Professor Emeritus of Music*

Charlie G. Turner, *Associate Professor Emeritus of Economics*

John E. Turner, *Associate Professor Emeritus of Occupational and Technical Studies*

Margaret Daugherty Van Damm, *Associate Professor Emerita of English*

Nancy L. Wade, *Associate Professor Emerita of Biological Sciences*

William Wagner, *Associate Professor Emeritus of Art*

Alice P. Wakefield, *Associate Professor Emerita of Teaching and Learning*

Stanley E. Weinstein, *Professor Emeritus of Mathematics and Statistics*

Thomas L. Wells, *Associate Professor Emeritus of Political Science and Geography*

Frederick D. Whitehurst, *Professor Emeritus of Accounting*

J. Christian Wild, *Associate Professor Emeritus of Computer Science*

Melvin H. Williams, *Eminent Scholar Emeritus and Professor Emeritus of Exercise Science, Physical Education and Recreation*

Roy L. Williams, *Professor Emeritus of Chemistry and Biochemistry*

Harold S. Wilson, *Professor Emeritus of History*

Jack H. Wilson, *Professor Emeritus of English*

Larry W. Wilson, *Associate Professor Emeritus of Computer Science*

Denny T. Wolfe Jr., *Professor Emeritus of Educational Curriculum and Instruction*

Lloyd Wolfinbarger Jr., *Professor Emeritus of Biological Sciences*

George T. Wong, *Professor Emeritus of Ocean, Earth and Atmospheric Sciences*

Robert J. Wunderlin, *Associate Professor Emeritus of Psychology*

Betty J. H. Yarborough, *Eminent Scholar Emerita and Constance and Colgate Darden Professor Emerita of Education*

James H. Yuan, *Professor Emeritus of Chemistry and Biochemistry*

Helen Yura-Petro, *Professor Emerita of Nursing*

Michelle L. Zimmerman, *Associate Professor Emerita of Nursing*

Course Descriptions

Courses of Instruction

Courses in which the leading number is zero, e.g. 050, are nondegree noncredit courses primarily in developmental studies.

Courses numbered 100 are primarily for freshmen, 200 for sophomores, 300 for juniors, 400 for seniors. 500-, 600-, 700-, and 800-level courses are generally for graduate credit. Courses at the 500 level correspond to undergraduate 400-level courses; however, a different grading scale is used for 500-level registrants. Additional and higher quality work is required in 500-level courses.

General education courses are designated by the fourth digit in the course number. At the lower division, the following designations are used: for Skills courses, C=Composition, F=Language and Culture, G=Information Literacy and Research, M=Mathematics, and R=Oral Communication; for Ways of Knowing courses, A=Human Creativity, H=Interpreting the Past, L=Literature, N=The Nature of Science, P and E=Philosophy and Ethics, S=Human Behavior, and T=Impact of Technology. Writing intensive courses are designated by a W in the fourth digit.

Some of the courses listed indicate the semester the course will be offered. Every attempt will be made to offer the courses in the semester(s) indicated. However, this may not always be possible. Please consult the academic advisor or graduate program director for course offerings.

The University reserves the right to withdraw any course for which there is insufficient registration.

AAST - African-American Studies

AFRICAN-AMERICAN STUDIES Courses

AAST 597. Independent Study. 1-3 Credits.

Students are exposed to opportunities to conduct independent research and/or study in areas focused on the political, social and cultural experiences of people of African descent in the U.S. and the African Diaspora. Prerequisites: Permission of instructor.

ACCT - Accounting

ACCOUNTING Courses

ACCT 505. Accounting and Auditing in the Public/Nonprofit Sector. 3 Credits.

The application of accounting principles to governmental funds and not-for-profit organizations. Emphasis is placed on budgeting and control as well as auditing concerns for such entities. Prerequisites: Graduate standing and a level of competency in accounting at the intermediate level or higher.

ACCT 511. Financial Auditing. 3 Credits.

Standards and ethics of the public accounting profession, generally accepted auditing standards, and public reporting are covered, as well as exposure to other types of auditing such as operational and compliance auditing. Prerequisites: Graduate standing and a level of competency at the intermediate accounting level or higher.

ACCT 521. Taxation. 3 Credits.

An analysis of federal income tax law and its application to personal and business tax situations. Reconciliation of tax and accounting concepts. Prerequisites: Graduate standing and a level of competency in accounting at the intermediate level or higher.

ACCT 522. Federal Income Taxation of Individuals and Business Entities. 3 Credits.

An analysis of federal income tax laws and its application to individuals and business entities. Prerequisites: Graduate standing and a level of competency in tax accounting.

ACCT 550. International and Advanced Accounting. 3 Credits.

The study of accounting for international operations and business combinations.

ACCT 601. Accounting for Managers. 3 Credits.

A study of the concepts of financial and managerial accounting. Covers the financial reporting process and the development of financial statements for external users while exposing students to internally generated accounting information. The overall objective of the course is to provide students with sufficient knowledge and competency to be intelligent users of accounting information.

ACCT 609. Managerial Accounting. 2 Credits.

A study of concepts of managerial accounting. This course focuses on the techniques and approaches to organizing and understanding internally generated accounting information. The objective of the course is to provide students with a set of tools that utilize managerial accounting information for solving business problems. Prerequisites: Admission to the MBA Program, MBA 600, MBA 601, MBA 602, MBA 603, and MBA 604.

ACCT 611. Financial Accounting. 2 Credits.

A study of the concepts of financial accounting. This course covers the financial reporting process and the development of financial statements for external users. The overall objective of the course is to provide students with a sufficient fluency to be intelligent readers of financial accounting information. Prerequisites: Admission to the MBA Program, MBA 600, MBA 601, MBA 602, MBA 603, and MBA 604.

ACCT 623. Operational Assurance Services. 3 Credits.

Standards, ethics, and practice of operational auditing particularly as it concerns the internal auditing profession, as well as exposure to financial auditing. Prerequisites: ACCT 601 or equivalent.

ACCT 624. Information Technology Assurance Services. 3 Credits.

Standards, ethics, and practice of information technology assurance services particularly as it concerns the governance and control of information systems. Prerequisites: ACCT 601 or equivalent.

ACCT 625. Fraud Examination and Forensic Accounting. 3 Credits.

Standards, ethics, and practice of fraud examination and forensic accounting particularly as it concerns the accounting profession. Prerequisites: ACCT 601 or equivalent.

ACCT 626. Financial and Global Accounting. 3 Credits.

Course covers current financial accounting standards and the reporting problems faced by national and multinational corporations in reporting financial information to external users in a global economy. Discussion of the various techniques for presenting and analyzing financial statements and the ethical issues related to those presentations.

ACCT 627. Operational Cost Control. 3 Credits.

Covers cost concepts and analysis in both a manufacturing and service operational environment. Provides an introduction to activity based costing and standard cost systems, methodology for measuring productivity changes and cost of quality and measurement and control of operating performance. Prerequisites: ACCT 601 or equivalent.

ACCT 630. Financial Statement Analysis. 3 Credits.

This course covers the analysis and interpretation of financial statements, including the significant accounting issues involved in performing an effective evaluation of a company. Accounting and financial analysis are used to provide a framework for applying the various techniques for analyzing and interpreting financial statements.

ACCT 631. Advanced Financial Auditing. 3 Credits.

Advanced concepts associated with the public accounting profession, generally accepted auditing standards, public accounting reporting, and recent developments, such as Sarbanes-Oxley/Public Company Accounting Oversight Board, are emphasized.

ACCT 640. Professional Ethics and Legal Issues In Accounting. 3 Credits.

An intensive course covering ethical and legal issues confronted by practicing accountants. The course emphasizes rigorous analysis of complex situations leading to appropriate ethical and legal solutions.

ACCT 667. Cooperative Education. 1-3 Credits.

Student participation in a full-time professional work experience. Prerequisites: Permission of the departmental chair in accordance with departmental Cooperative Education policies and approval of Career Management.

ACCT 668. Accounting Internship. 1-3 Credits.

The course is a practicum in the profession of accounting where theories, concepts, and financial management techniques are applied in a business environment. Prerequisites: Permission of the departmental chair.

ACCT 693. Selected Topics in Accounting. 3 Credits.

Study designed for students who have had one of the required courses waived or for students desiring additional work in an area of particular interest in accounting. Prerequisites: Permission of the chair of the Department of Accounting and the graduate program director, and a minimum B average in graduate work.

ACCT 727. Strategic Cost Management. 3 Credits.

Focuses on advanced costing concepts, current management accounting practices, and analytical techniques employed by controllers in supporting their organization's strategic planning process.

ACCT 747. Seminar in Controllorship. 3 Credits.

Prerequisites: ACCT 627 or equivalent. This course is the capstone course for the study of management accounting. It includes a review of management accounting practices and analytical techniques employed by controllers in supporting their organization's strategic decision-making process.

ACCT 998. ACCT 998. 1 Credit.**ACCT 999. ACCT 999. 1 Credit.**

AL - Arts and Letters

ARTS AND LETTERS Courses

AL 595. Topics in Humanities. 1-3 Credits.

An advanced study of selected topics in humanities.

AL 596. Topics in Social Studies. 3 Credits.

An advanced study of selected topics in social studies.

AL 597. Tutorial Work in Arts and Letters Topics. 3 Credits.

Independent reading and study on a topic to be selected under the direction of an instructor. Conferences and papers as appropriate. Prerequisites: Permission of instructor.

AL 695. Topics. 1-3 Credits.

An interdisciplinary study of selected topics in arts and letters.

AL 795. Topics. 1-3 Credits.

1-3 credits. Seminar on special interdisciplinary topics for small groups of qualified students. Prerequisites: Advanced graduate standing.

AL 797. Tutorial Work in Arts and Letters Topics. 1-3 Credits.

Independent reading and study on a topic to be selected under the direction of an instructor. Conferences and papers as appropriate.

AL 895. Topics. 1-3 Credits.

Seminar on special interdisciplinary topics for small groups of qualified students. Prerequisites: Advanced graduate standing.

AL 897. Tutorial Work in Arts and Letters Topics. 1-3 Credits.

Independent reading and study on a topic to be selected under the direction of an instructor. Conferences and papers as appropriate.

ANTR - Anthropology

ANTHROPOLOGY Courses

ANTR 595. Topics in Anthropology. 1-3 Credits.

A study of selected topics designed for either majors or nonmajors. These courses will appear in the course schedule, and will be more fully described in information distributed to academic advisors. Prerequisites: Approval of the department chair.

ANTR 596. Topics in Anthropology. 1-3 Credits.

A study of selected topics designed for either majors or nonmajors. These courses will appear in the course schedule, and will be more fully described in information distributed to academic advisors. Prerequisites: Approval of the department chair.

ANTR 597. Tutorial Work in Special Topics in Anthropology. 3 Credits.

Independent reading and study on a topic to be selected under the direction of an instructor. Conferences and papers as appropriate. Prerequisites: Approval of department chair.

ANTR 598. Tutorial Work in Special Topics in Anthropology. 3 Credits.

Independent reading and study on a topic to be selected under the direction of an instructor. Conferences and papers as appropriate. Prerequisites: Approval of department chair.

ANTR 695. Topics in Anthropology. 1-3 Credits.

A study of selected topics for graduate students. The courses will appear in the course schedule, and will be more fully described in information sent to graduate advisors.

ANTR 696. Topics in Anthropology. 1-3 Credits.

A study of selected topics for graduate students. The courses will appear in the course schedule, and will be more fully described in information sent to graduate advisors.

ANTR 697. Tutorial Work in Special Topics in Anthropology. 3 Credits.

Independent reading and study on a topic to be selected under the direction of a member of the graduate faculty. Conferences and papers as appropriate.

ANTR 698. Tutorial Work in Special Topics in Anthropology. 3 Credits.

Independent reading and study on a topic to be selected under the direction of a member of the graduate faculty. Conferences and papers as appropriate.

ARTH - Art History

ART HISTORY Courses

ARTH 521. Early Medieval Art. 3 Credits.

The art and architecture of the Latin West and Byzantium from the early Christian centuries and the fall of Rome to the Carolingian and Ottoman empire and the fully developed Romanesque of the twelfth century, including manuscripts, metalwork, ivories and enamels.

ARTH 522. Gothic Art and Architecture. 3 Credits.

The painting, sculpture, and architecture of the Gothic period from the mid-twelfth century to the refined and courtly art of the later International Style in France, England, Germany, and Italy as seen in both the monumental and the decorative arts.

ARTH 523. Romanesque Art and Architecture. 3 Credits.

The art and architecture of the period from about 1000 to 1150 in western Europe, including monumental architectural forms, monumental painting and increased book production.

ARTH 534. Romantic Architecture. 3 Credits.

A survey of the aesthetic, technological and social forces that transformed international architecture in the 18th and 19th centuries.

ARTH 535. Modern Architecture. 3 Credits.

An examination of the architecture, planning, and related design of the twentieth and twenty-first centuries around the globe. Special emphasis is placed on the formation of the international style between the world wars and its disintegration in the recent past.

ARTH 538. Fin de Siecle European Art. 3 Credits.

An intensive examination of the major styles, movements, and individuals working in Europe's avant-garde at the end of the 19th century to the beginning of the first world war.

ARTH 539. Art Between the Wars: 1919-1939. 3 Credits.

A study of the international movements in visual arts and design in the interwar years from Dada to the New York World's Fair.

ARTH 540. Mid-Century Modern Art (1940-1960). 3 Credits.

An intensive study of the two decades when modernist styles and theories in art, design, and architecture were codified and challenged internationally.

ARTH 560. Art Since 1960. 3 Credits.

Lectures and critical discussion of the development and configurations of the various styles emergent since 1960, both in America and Europe.

ARTH 595. Topics in Art History. 3 Credits.

A study of selected topics in art history to be specified in the class schedule each semester. May be repeated for credit as topics vary.

ARTH 596. Topics in Art History. 3 Credits.

A study of selected topics in art history to be specified in the class schedule each semester. May be repeated for credit as topics vary.

ARTH 597. Tutorial Work in Art History. 3 Credits.

Independent research on a topic to be selected under the guidance of the instructor.

ARTH 598. Tutorial Work in Art History. 3 Credits.

Independent research on a topic to be selected under the guidance of the instructor.

ARTH 600. Graduate Seminar: Art Criticism. 3 Credits.

An examination of critical methodologies as they relate to the visual arts, with readings drawn from the contemporary scene and the recent past.

ARTH 610. Visual Arts Across Media and Time. 3 Credits.

This course is an introduction to emerging creative, curricular, and research activities in contemporary art, design, art education, and art history.

Through lectures, readings, discussion, critical analysis, and creative work, students will engage with ideas and artwork across the broad spectrum of contemporary practice.

ARTH 668. Internship. 3 Credits.

A structured work experience in a museum, gallery, archive, or related environment, either with or without remuneration. Criteria for evaluation will be determined by work supervisor and cooperating faculty advisor. May be repeated for credit. Available for pass/fail grading only.

ARTH 695. Topics in Art History. 1-3 Credits.

Topics to be specified in the class schedule. Intensive critical investigations of specialized areas in art history. May be repeated for credit as topics vary.

ARTH 697. Tutorial in Art History. 1-3 Credits.

Independent research on a topic to be selected under the guidance of the instructor.

ARTS - Art, Studio

ART, STUDIO Courses

ARTS 512. Photo Seminar 1. 3 Credits.

The first of a two-semester sequence of concentrated individual work. Students will identify a topic and create a complete body of work. Lectures, readings, discussion, critique, and field trips to develop the articulation of ideas and the clarification of purpose.

ARTS 513. Photo Seminar 2. 3 Credits.

This is the second in a two-semester sequence of concentrated individual work. Through readings, discussion, critiques, field trips, and intense individual work, students will compile a body of work realizing their personal vision and articulate their ideas through the crafting of an artist statement.

ARTS 531. Drawing Studio. 3 Credits.

Further concentration on conceptual content and drawing skills, development of individual body of work exploring preferred concepts, subject matter, techniques, and media. May be repeated for credit.

ARTS 532. Figure Drawing Anatomy. 3 Credits.

A study of visually important aspects of the structural, skeletal and muscular systems of the body. Anatomical study will be related to drawing from the live model.

ARTS 533. Figure Drawing/ Composition. 3 Credits.

This course places the emphasis on advanced composition using the figure as the central theme. The figure's expressive potential, along with a study of historical responses to figure drawing, will be examined in depth. Prerequisites: ARTS 532.

ARTS 542. Painting Studio. 3 Credits.

Independent work in painting with focus on developing content. Frequent critiques. May be taken for repeat credit.

ARTS 550. Printmaking Studio. 3 Credits.

Experimental work in selected print media.

ARTS 555. Letterpress Printmaking. 3 Credits.

A visual and literary investigation of language and wordplay using foundry and wood type and a Vandercook SP-20 proofing press. Projects include expressive printed impressions of personal poetry and song lyric, political rant, and broadsides for entertainment or proselytizing. A theme group project such as a folio or a bound book, is usually assigned.

ARTS 561. Sculpture Studio. 3 Credits.

Experimental work reflecting individual initiative and attitude.

ARTS 563. Advanced Ceramics. 3 Credits.

An advanced course in the science and art of ceramics. Students will engage in guided independent research, developing their own direction by investigating clay bodies, glazes, firing methods and contemporary ceramic art.

ARTS 569. Assemblage. 3 Credits.

Assemblage combines elements of various art and non-art media and materials. Lectures will be comprised of presentations about relevant artists, gallery and studio visits, and critiques. Studio time allows students to explore personal directions in the medium.

ARTS 573. The Book. 3 Credits.

The book as a work of art. Lecture will explore historical and technical aspects of book design and production. Studio work will be devoted to the production of a series of books involving page design, paper selection, printing and binding.

ARTS 575. Editorial Design. 3 Credits.

An examination of conceptual and design strategies associated with the layout of multi-page publication. Emphasis is placed on organizational and hierarchical systems, continuity and pacing, and the integration of image and type.

ARTS 581. Crafts III: Fibers. 3 Credits.

Advanced work in pattern drafting, loom techniques, off-loom weaving and fabric painting.

ARTS 591. Crafts III: Metalsmithing and Jewelry. 3 Credits.

Further exploration in casting and soldering with concentration in the metal-forming techniques of raising and forging. Additional introduction to the techniques of working in steel.

ARTS 595. Topics in Studio Art. 3 Credits.

The advanced study of selected topics designed to permit small groups of qualified students to work on studio projects of mutual interest. Prerequisites: permission of the instructor.

ARTS 597. Tutorial Work in Special Studio Topics. 3 Credits.

Independent investigation of a subject to be selected under the advisement of the instructor.

ARTS 610. Visual Arts Across Media and Time. 3 Credits.

This course is an introduction to and overview of emerging creative, curricular, and research activities in contemporary art, design, art education, and art history. Through lectures, readings, discussions, critical analysis, and creative work, students will engage with ideas and artwork across the broad spectrum of contemporary art education, production, and investigation.

ARTS 668. Internship. 3 Credits.

A structured work experience involving aspects of art, design or craft; film or video making; and/or museum/gallery work.

ARTS 695. Graduate Seminar: Special Topics in Contemporary Art. 3 Credits.

Topics to be specified in the class schedule. Intensive critical investigations of selected aspects of the visual arts which focus on the role of the artist in contemporary urban society. May be repeated for credit as topics vary.

ARTS 697. Graduate Studio. 3-6 Credits.

Supervised individual inquiry in specific studio projects relating to the areas of major interest. Prerequisites: permission of graduate program director required.

ARTS 698. Graduate Studio. 3-6 Credits.

Supervised individual inquiry in specific studio projects relating to the areas of major interest. Prerequisites: permission of graduate program director required.

ARTS 700. Directed Field Experience. 3-6 Credits.

Intern experiences in museums, community centers and arts programs, teaching assistantships, special apprenticeships, and field projects under the supervision of graduate faculty. Required of all M.F.A. candidates. Prerequisites: permission of graduate program director required.

ARTS 701. Thesis Exhibition. 3 Credits.

Required of M.F.A. candidates. Course requirements to be determined by the student's advisory committee. Final grade to be determined by the student's thesis review committee. Prerequisites: permission of graduate program director required.

ARTS 702. Documentation. 3 Credits.

Studio work in preparation for required graduate exhibition. Public exhibition to be approved by the student's advisory committee and must be accompanied by final review. Documentation may be required. Required of all M.A. and M.F.A. candidates. Final grade to be determined by the student's thesis review committee. Prerequisites: permission of graduate program director required.

ARTS 797. Graduate Studio. 3-6 Credits.

Supervised individual inquiry in specific studio projects relating to areas of major interest. Individual studio spaces will be assigned. Prerequisites: permission of graduate program director required.

ARTS 798. Graduate Studio. 3-6 Credits.

Supervised individual inquiry in specific studio projects relating to areas of major interest. Individual studio spaces will be assigned. Prerequisites: permission of graduate program director required.

ARTS 999. Audit Registration. 1 Credit.

A one-hour pass/fail registration required of all graduate students to maintain active status during the final semester prior to graduation. After successfully passing the candidacy examination, all master's students are required to be registered for at least one graduate credit each term until the degree is complete.

ASIA - Asian Studies

ASIAN STUDIES Courses

ASIA 595. Topics in Asian Studies. 3 Credits.

This course is designed for small groups of qualified students to conduct advanced study of selected topics on Asian Studies, topics which may not be taught in regularly scheduled classes. The description of the course for each offering will appear in the course schedule that is distributed to each advisor. Prerequisites: Appropriate survey source or permission of the instructor.

AT - Athletic Training

ATHLETIC TRAINING Courses

AT 618. Current Research in Athletic Training. 1 Credit.

Designed to provide an understanding of evidence-based practice to the sports medicine setting and the intricacies of performing evidence-based practice research projects.

AT 623. Athletic Training Practicum I. 1 Credit.

This course is designed to provide practical experience in the athletic training setting and an understanding of evidence-based practice in sports medicine.

AT 626. Advanced Orthopaedic Evaluation and Rehabilitation. 3 Credits.

This course is for sports medicine clinicians and will focus on advanced topics in the study of orthopaedic evaluation, assessment, management, and rehabilitation of common athletic injuries. A combination of discussion, lecture, critical review of literature, laboratory activities, and student presentations will be employed throughout the course.

AT 628. The Spine: Evaluation and Rehabilitation. 3 Credits.

A course designed to provide information relative to the recognition, evaluation, and treatment of athletic injuries involving the spine.

AT 630. Interdisciplinary Healthcare in Athletic Training Clinical Practice. 2 Credits.

This clinical experience entails interaction with healthcare providers associated with sports medicine specialties and general medical concerns.

AT 633. Athletic Training Practicum II. 1 Credit.

This course is designed to provide practical experience in the athletic training setting and an understanding of evidence-based practice in sports medicine.

AT 643. Athletic Training Practicum III. 1 Credit.

This course is designed to provide practical experience in the athletic training setting and an understanding of evidence-based practice in sports medicine.

AT 650. Integration of Evidence for Clinical Decision Making in Sports Medicine. 3 Credits.

This course is designed to introduce the graduate student to research processes in the athletic training field. The focus is on understanding and recognizing principles of EBP in athletic training, understanding the elements of evidence, appraising the evidence, and considering the evidence for use in clinical practice.

AT 651. Statistical Techniques for Clinical Decision Making in Sports Medicine. 3 Credits.

This course includes conceptual and computational applications associated with the common statistical techniques relevant to sports medicine clinicians. The intent is to provide students with an introduction to frequently used descriptive and inferential statistical methods for clinical or research purposes in sports medicine. Lectures and laboratory exercises will be utilized to instruct students on using statistics to be intelligent consumers of the research literature. Emphasis will be placed on using statistics to make informed, evidence-based clinical decisions with the goal of enhancing patient care. Prerequisite: AT 650.

AT 653. Athletic Training Practicum IV. 1 Credit.

This course is designed to provide practical experience in the athletic training setting and an understanding of evidence-based practice in sports medicine.

AT 655. Supervised Teaching Internship. 2 Credits.

This course is designed to provide supervised and mentored teaching experience within fields applicable to athletic training.

AT 657. Lower Extremity Injury Management Strategies. 3 Credits.

Stresses clinical techniques used in the management and assessment of the lower extremity and spine through utilization of evidence-based practice.

AT 670. Athletic Training Research I. 1 Credit.

This course is designed to systematically guide post-professional athletic training students through the research process. Coursework will focus on development of an original research idea, building the theoretical background, and identifying the rationale for a research project. Based on the nature of this course, students will be required to meet with a research supervisor outside of the time permitted for class. Prerequisite: AT 650.

AT 671. Athletic Training Research II. 2 Credits.

This is a course designed to guide post-professional athletic training students through aspects of the research process. Coursework will focus on writing the Methods sections for a research manuscript, writing the results section for a research manuscript and proper data entry techniques for a research project. Based on the nature of this course, students will be required to meet with a research supervisor and collect data for their respective project outside of the time permitted for class. Prerequisites: AT 670.

AT 672. Athletic Training Research III. 3 Credits.

This course is designed to guide post-professional athletic training students through aspects of the research process. Coursework will focus on writing the discussion section for a research manuscript, writing a research abstract for submission to a conference, developing an oral research presentation for a conference, and creating a poster presentation for a conference. Based on the nature of this course, students will be required to meet with a research supervisor outside of the time permitted for class. Prerequisites: AT 671.

AT 691. Gross Anatomy for Sports Medicine Clinicians. 4 Credits.

This course will include dissection of a human cadaver and will be supplemented with classroom lectures. The course is designed to teach graduate athletic training students the principles and concepts of human gross anatomy as they apply to clinical practice. Emphasis will be on the musculoskeletal, nervous, and vascular systems of the extremities.

AT 711. Analysis of Human Motion for Sports Medicine Clinicians. 3 Credits.

This course includes theories and applications of techniques concerning the analysis of human motion for the sports medicine clinician. The intent of this course is to provide students with an introduction to quantitative analysis of human motion and the concepts and equipment to collect objective quantifiable data for clinical or research purposes.

AT 756. Education in Athletic Training. 4 Credits.

Designed to introduce current concepts of curriculum development, evaluation methods, course construction and testing as related to the athletic training clinical and didactic experience. Designed to introduce the graduate student to aspects of the management of learning and instruction; how learners learn and how teachers can facilitate their learning as related to the athletic training didactic and clinical experience.

AT 811. Analysis of Human Motion for Sports Medicine Clinicians. 3 Credits.

This course includes theories and applications of techniques concerning the analysis of human motion. It is designed to provide opportunities for the advanced study of motion analysis techniques for the study of human movement. The intent of this course is to provide students with an extensive knowledge concerning quantitative analysis of human motion and the concepts and equipment to collect objective quantifiable data to be used for clinical or research purposes.

BIMD - Biomedical Sciences

BIOMEDICAL SCIENCES Courses

BIMD 702. Medical Molecular and Cellular Biology. 4 Credits.**BIMD 703. Medical Biochemistry. 4 Credits.****BIMD 706. Pharmacology. 5 Credits.****BIMD 708. Medical Neuroscience. 5 Credits.****BIMD 715. Human Physiology I. 2 Credits.****BIMD 716. Human Physiology II. 3 Credits.****BIMD 725. Neurocytology and Ultrastructure of the Nervous System. 2 Credits.****BIMD 726. Medical Histology. 5 Credits.****BIMD 739. Topics Biochemical and Molecular Biology. 1 Credit.****BIMD 741. Introduction to Research Literature. 1 Credit.****BIMD 743. Foundations of Molecular Biology. 3 Credits.****BIMD 745. Molecular Cytogenetics. 4 Credits.****BIMD 746. History of Genetics. 3 Credits.****BIMD 747. Mammalian Reproduction. 3 Credits.****BIMD 748. Concepts in Cellular Biology and Physiology. 3 Credits.****BIMD 751. Neuroendocrinology. 1 Credit.****BIMD 753. Special Topics in Genetics. 1 Credit.****BIMD 756. Advanced Cardiovascular Sciences. 3 Credits.****BIMD 757. Current Topics in Cardiovascular Science. 1 Credit.****BIMD 765. Neuropharmacology 1. 3 Credits.****BIMD 771. Advanced Endocrinology. 3 Credits.****BIMD 772. Biochemical and Physiologic Bases of Nutrition. 3 Credits.****BIMD 773. Responsible Conduct in Science. 1 Credit.****BIMD 774. Topics in Growth Factor Physiology. 1 Credit.****BIMD 801. Medical Gross Anatomy. 6 Credits.****BIMD 802. Medical Molecular and Cellular Biology. 4 Credits.****BIMD 803. Medical Biochemistry. 4 Credits.****BIMD 804. Medical Microbiology and Immunology. 7 Credits.****BIMD 805. Topics in Genomics and Bioinformatics. 1 Credit.****BIMD 806. Pharmacology. 5 Credits.****BIMD 808. Medical Neuroscience. 5 Credits.****BIMD 809. Medical Microbiology and Bacteriology. 2 Credits.****BIMD 810. Medical Microbiology and Virology. 2 Credits.****BIMD 811. Medical Microbiology, Mycology, and Parasitology. 1 Credit.****BIMD 812. Medical Microbiology and Immunology. 2 Credits.****BIMD 814. Biomedical Sciences Laboratory. 2 Credits.****BIMD 815. Human Physiology I. 2 Credits.****BIMD 816. Human Physiology II. 3 Credits.****BIMD 825. Neurocytology and Ultrastructure of the Nervous System. 2 Credits.****BIMD 826. Medical Histology. 5 Credits.****BIMD 839. Topics Biochemical and Molecular Biology. 1 Credit.****BIMD 840. Topics Molecular Biology. 3 Credits.****BIMD 841. Introduction to Research Literature. 1 Credit.****BIMD 842. Topics in Molecular and Integrative Biomedical Sciences. 1 Credit.****BIMD 843. Foundations of Molecular Biology. 3 Credits.****BIMD 845. Molecular Cytogenetics. 4 Credits.****BIMD 846. History of Genetics. 3 Credits.****BIMD 847. Mammalian Reproduction. 3 Credits.****BIMD 848. Concepts in Cellular Biology and Physiology. 3 Credits.****BIMD 849. Topics in Molecular and Cellular Immunology. 2 Credits.****BIMD 851. Neuroendocrinology. 1 Credit.****BIMD 852. Animal Virology. 3 Credits.****BIMD 853. Special Topics in Genetics. 1 Credit.****BIMD 854. Tumor Biology. 3 Credits.****BIMD 856. Advanced Cardiovascular Sciences. 3 Credits.****BIMD 857. Current Topics in Cardiovascular Science. 1 Credit.****BIMD 865. Neuropharmacology. 3 Credits.****BIMD 871. Advanced Endocrinology. 3 Credits.****BIMD 872. Biochemical and Physiologic Bases of Nutrition. 3 Credits.****BIMD 873. Responsible Conduct in Science. 1 Credit.****BIMD 874. Topics in Growth Factor Physiology. 1 Credit.****BIMD 890. Applied Statistics for Biomedical Research. 4 Credits.****BIMD 895. Special Topics in Biomedical Sciences. 1-3 Credits.****BIMD 897. Seminar. 1 Credit.****BIMD 898. Research. 1-6 Credits.****BIMD 899. Dissertation. 1-6 Credits.**

BIOL - Biological Sciences

BIOLOGICAL SCIENCES Courses

BIOL 500. Flowering Plant Families. 5 Credits.

An evolutionary survey of vascular plant families; emphasis on recognition and identification of plant families and the principles and methodologies that define them. A field-intensive, hands-on course. Prerequisites: A botany course.

BIOL 501. Entomology. 4 Credits.

A comprehensive survey of the insects, including taxonomy, morphology, physiology, reproductive and developmental biology, and ecology. Research techniques in entomology will be learned through both field and laboratory work.

BIOL 503. Medical Microbiology. 3 Credits.

This course integrates the disciplines of microbiology, immunology, and biochemistry with the pathophysiology of infections and the appropriate pharmacology in a problem-based learning setting. Students will learn the fundamental concepts and terminologies of infectious diseases. The material will be case studies in small group tutorials and emphasize independent learning. Prerequisites: Microbiology and Biochemistry courses, anatomy course recommended, or instructor approval.

BIOL 504. Conservation Biology. 5 Credits.

The application of fundamental biological principles to the preservation of biodiversity, including the role of ecological and evolutionary theory to the preservation of biotas on a regional and global basis. Lectures will cover modern approaches to conservation biology, including conservation ethics and management issues. Laboratories will include discussion of case studies, introduction to software applicable to conservation biology, presentations by regional conservation practitioners, and visits to relevant field sites.

BIOL 508. Introduction to Pharmacology. 4 Credits.

This is a general introductory course in pharmacology dealing with chemistry, general properties and pharmacological effects on various physiological systems, therapeutic usefulness and toxicities of drugs. The course is designed to prepare upper-level undergraduate and graduate students for more advanced courses in pharmacology.

BIOL 509. Immunology. 3 Credits.

A comprehensive study of the phenomena of immune resistance, the cells and tissues involved in immune responses, and the consequences of immunization. Prerequisites: permission of the instructor.

BIOL 512. Plant Physiology. 4 Credits.

A study of the physiological processes which occur in plants. A laboratory and greenhouse oriented course stressing plant nutrients, cell metabolism-respiration, photosynthesis, nitrogen metabolism, and plant hormones.

BIOL 515. Marine Ecology. 3 Credits.

An introduction to ecological processes in the marine environment, with an emphasis on coastal ecosystems. The course covers synthetic topics as well as the ecology of specific marine habitats. Prerequisites: A previous course in marine biology. Pre- or corequisites: When offered during the fall semester, BIOL 542 is a corequisite.

BIOL 516. Clinical Immunology. 3 Credits.

A description of common immunological problems seen in the clinic. Prerequisites: BIOL 509.

BIOL 519. Wetland Plants. 5 Credits.

A field-oriented course on the identification of plants used to delineate wetlands including ecology, variability, and distribution. Prerequisites: A botany course.

BIOL 520. Ichthyology. 5 Credits.

The biology of marine and freshwater fishes including morphology, physiology, evolution, distribution, ecology, and reproduction.

BIOL 522. Field Studies in Ornithology. 4 Credits.

A combined lecture and field study of birds with emphasis on identification, behavior, and field methods. Extensive field trips, including at least one weekend, are taken.

BIOL 523. Cellular and Molecular Biology. 3 Credits.

The molecular organization of eukaryotic cells is presented along with cell evolution, molecular genetics, the internal organization of the cell and the behavior of cells in multicellular organisms. Prerequisites: course background in cell biology and genetics or permission of the instructor.

BIOL 524. Comparative Animal Physiology. 5 Credits.

An introduction to the basic mechanisms by which different animals function. How organisms acquire and use energy, regulate their internal environment, circulate and exchange gases and wastes, receive and conduct information about their environment, and move and use muscles will be some of the topics covered. Emphasis will be on how organisms make changes in these basic mechanisms to deal with different environmental conditions.

BIOL 525. Cancer Biology. 3 Credits.

This course will examine how mutation leads to altered gene products and expression, subverted cell activity, cell immortalization, and tumor formation. Students will explore the differences between benign tumors and malignant tumors as well as the factors involved in malignancy. The course will conclude with the exploration of current cancer therapy. Prerequisites: Cell Biology and Genetics courses.

BIOL 526. Histology. 5 Credits.

The structure and function of cells, tissues and organs at both the light microscopic and ultrastructural levels.

BIOL 530. Microbial Pathogenesis. 3 Credits.

Examination of bacterium-host interactions with an emphasis on how bacteria cause disease, particularly the means by which the bacterium is able to circumvent host defense mechanisms. Prerequisites: microbiology course.

BIOL 535. Marine Conservation Biology. 3 Credits.

This highly interdisciplinary science of conserving marine biodiversity will be taught through a review of old and new literature. This will include its history, marine ecology related to conservation biology, threats to marine biodiversity, assessment of extinction risk, conservation challenges of marine habitats and regions, and methods for conserving marine biodiversity.

BIOL 536. Infectious Disease Epidemiology. 3 Credits.

This lecture/lab course will focus on concepts related to the spread and control of infectious diseases. The lectures will focus on concepts while the labs will provide quantitative skills essential to the study of infectious diseases. Prerequisites: Undergraduate coursework in statistics and biology.

BIOL 538. Dendrology. 4 Credits.

The study of trees and shrubs, their identification, ecology, structure and anatomy, lore, and uses. A field-oriented course. A research project including a written paper and presentation is required. Prerequisites: Botany course.

BIOL 541. Animal Behavior. 5 Credits.

Animal behavior with special attention to its evolution and ecological significance. Field and laboratory activities will emphasize observational and experimental techniques used to study behavior.

BIOL 542. Marine Ecology Laboratory. 2 Credits.

A laboratory/field course in which students gain practical experience with research techniques common to coastal marine ecology, and become familiar with the organisms and ecological conditions present in the various marine habitats visited by the class. A field trip of several days is required. Pre- or corequisite: When offered during the fall semester, BIOL 515 is a corequisite.

BIOL 544. Field Studies in Marine Biology. 5 Credits.

An intensive study abroad field course offered during the summer at a foreign marine laboratory where students will be engaged in lectures and field studies of coastal marine environments. Check with the Director of the Marine Biology Concentration Program for details. Prerequisite: BIOL 331.

BIOL 545. Community Ecology. 3 Credits.

The goal of this course is to introduce and evaluate both classical and emerging paradigms in community ecology. This will be achieved by examining those processes (biotic and abiotic) that structure ecological communities, and by exposing students to quantitative and theoretical aspects of these paradigms. Prerequisites: Ecology course.

BIOL 546. Comparative Biomechanics. 3 Credits.

The principles of fluid and solid mechanics will be applied to a variety of plant and animal systems to understand how organisms deal with the immediate physical world and its accompanying constraints. A diverse range of topics will be covered, including aerial flight in insects, wind resistance in trees, jet propulsion in squid, flow within blood vessels, forces on intertidal organisms, viscoelasticity in biological materials, and energy storage during terrestrial movement. Prerequisites: Cell biology course and physics course recommended.

BIOL 550. Principles of Plant Ecology. 4 Credits.

Course covers the general theoretical concepts in plant ecology with statistical methods. The structure, development, processes, and history of plant communities are studied. Laboratories involve extensive fieldwork. A weekend field trip is required.

BIOL 553. Molecular Ecology. 4 Credits.

This course will explore the biology of organisms by using molecular (nucleic acid and/or protein) techniques and data. It covers a wide variety of subdisciplines within Biology, including genetics, physiology, ecology, and evolution. This course will explore basic theory in population genetics, ecology, and evolution and cover DNA, RNA, and Protein techniques and their application to biological research.

BIOL 556. Population Genetics. 3 Credits.

An introduction to the principles of population genetics that address topics such as inheritance, genetic variation, fitness, natural selection, mutation, genetic drift, gene expression, and single- and multi-locus models of different types of selection. Human disease is addressed. Students will write a mock-grant proposal. Prerequisite: BIOL 303.

BIOL 557. General Virology. 3 Credits.

A basic course covering the history of virology, viral taxonomy, genetics, and the molecular biology and host responses to the major mammalian virus groups. Examples of recent impacts of viruses on human health such as influenza pandemics will also be covered. Prerequisites: courses in cell biology and genetics.

BIOL 560. Frontiers in Nanoscience and Nanotechnology. 1 Credit.

Review of the structure, synthesis and properties of key nano-materials and their impact on living systems. Prerequisite: graduate standing.

BIOL 561. Human Cadaver Dissection. 4 Credits.

Students will dissect a human cadaver and learn all major structures. All exams will be practical tag-tests using human tissue. The major emphasis will be on head, neck, trunk, and joints with some clinical application to injuries and surgery.

BIOL 562. Microbial Genetics. 3 Credits.

This course emphasizes the fundamental concepts of microbial genetics including the study of gene structure, gene regulation, operons, DNA replication, RNA biology, protein synthesis, plasmid biology, mobile genetic elements, and recombinant DNA technology. Prerequisites: Courses in cell biology, genetics and general microbiology.

BIOL 563. Cell Signaling in Host Pathogen Interactions. 3 Credits.

This course will emphasize cell dynamics including host and pathogen induced cellular signaling, the regulation of actin cytoskeleton rearrangement, and the modulation of host transcription and translation by different pathogens. Prerequisites: A cell biology course.

BIOL 564. Biomedical Applications of Low Temperature Plasmas. 3 Credits.

This course is cross listed between ECE and Biology. It is designed to be taken by senior undergraduate students and first year graduate students. The course contents are multidisciplinary, combining materials from engineering and the biological sciences. The course covers an introduction to the fundamentals of non-equilibrium plasmas, low temperature plasma sources, and cell biology. This is followed by a detailed discussion of the interaction of low temperature plasma with biological cells, both prokaryotes and eukaryotes. Potential applications in medicine such as wound healing, blood coagulation, sterilization, and the killing of various types of cancer cells will be covered.

BIOL 574. Mushrooms. 4 Credits.

The identification, classification ecology, culture, and uses of mushrooms and other fleshy fungi. A field oriented course.

BIOL 578. Microbial Ecology. 3 Credits.

Study of the interactions between microorganisms, particularly bacteria, and their environment. Emphasis is placed on nutrient cycling and the influence of microbes on global mineral dynamics. The effects of physical and chemical factors on distribution and activity of microbes in their environments and applications of these interactions are studied (biotechnology). Prerequisites: a general microbiology course.

BIOL 579. Microbial Ecology Laboratory. 1 Credit.

A laboratory for measurement of microbial numbers and activity in natural environments. Pre- or corequisite: BIOL 578.

BIOL 580. Advanced Human Physiology Laboratory. 2 Credits.

A study of the cardiovascular, respiratory, nervous and digestive systems using mammals.

BIOL 581. Forensic and Medical Entomology. 5 Credits.

A comprehensive survey of insects important to legal and medical fields, including their biology, use in criminal investigations and roles as disease vectors. Laboratories will include exercises in both field and bench laboratory activities.

BIOL 582. Human and Veterinary Parasitology. 3 Credits.

The course will cover principles of parasitism, including biology, physiology, genetics, morphology, and phylogeny of the major parasitic groups. The course will concentrate on significant parasites of humans and animals of veterinary importance, and will discuss general parasite biology including life cycles, diagnosis, and treatment. Pre- or corequisite: A cell biology course.

BIOL 590. Advanced Human Physiology. 4 Credits.

All major physiological systems with emphasis on normal physiology. Some clinical applications made but not stressed.

BIOL 596. Topics in Biology. 1-3 Credits.

Prerequisites: Permission of the instructor. A specially designed course concerning specific topics in the biological, environmental, or allied health fields.

BIOL 598. Independent Study in Biology. 1-3 Credits.

Supervised (non-lab/field) project selected to suit the needs of the individual student. Requires completion of formal scientific paper documented with appropriate primary technical literature (see GPD for details). Unstructured course. Prerequisites: permission of the GPD and permission of instructor.

BIOL 609. Special Readings in Biology. 3 Credits.

Reading and discussion course designed to explore a field of specific interest.

BIOL 620. Biometry. 4 Credits.

A first course, or a refresher course, in statistical methods and experimental design for graduate students in biology and the natural sciences. The focus is on application and hypothesis testing with examples drawn from the field of biology. The course requires a significant amount of work outside the classroom on homework exercises and an independent project. Prerequisites: A Statistics course.

BIOL 640. Microbial Toxins. 3 Credits.

This course will focus on the mechanisms of action of microbial toxins, including those affecting the host's nervous system, immune function, metabolism, protein synthesis, and homeostasis. The structure and function of representatives of several toxin types will be analyzed for their potential applications to biotechnology and medicine. Prerequisites: A general microbiology course and a microbial pathogenesis course.

BIOL 661. Topics in Biology. 1-3 Credits.

1-3 credits. Supervised projects and practica selected to meet the specific objectives of the student.

BIOL 669. Internship in Biology. 3 Credits.

3 credits. With approval of Advisory Committee.

BIOL 671. Molecular and Immunological Techniques. 4 Credits.

Lecture, 1 hour; lab, 6 hours. 4 credits. A lab-intensive course emphasizing current methods in molecular biology.

BIOL 672. Responsible Conduct in Research. 2 Credits.

2 cr. Lecture. Required of all graduate students admitted to Biology programs. The course will introduce students to the responsible conduct of science and scientific research.

BIOL 695. Topics in Biology. 1-3 Credits.

1-3 credits. A specially designed course concerning specific topics in the biological, environmental or allied health fields.

BIOL 698. Research in Biology. 1-3 Credits.**BIOL 699. Thesis. 3 Credits.**

3 credits. This course is selected with the recommendation of the faculty advisor.

BIOL 700. Cardiovascular Physiology. 4 Credits.

4 credits. This physiology course will focus solely on Cardiovascular Physiology. Lectures will focus on basic and advanced cardiovascular principles. The laboratory will focus on the use of current cardiovascular research.

BIOL 701. Practical Computing for Biology. 3 Credits.

This hands-on training course emphasizes the use of general computing tools to work more effectively in the biological sciences. It integrates a broad range of powerful and flexible tools that are applicable to ecologists, molecular biologists, physiologists, and anyone who has struggled analyzing large or complex data sets. Text file manipulation with regular expressions, basic shell scripting, programming in Python and R, interaction with remote devices, and basic graphical concepts will be reviewed.

BIOL 702. Biomedical Sciences Journal Club. 1 Credit.

1 credit. Review and discussion of current papers in the areas of biomedical sciences. Student presentation, discussions and readings in this field required.

BIOL 705. Advanced Microbiology. 4 Credits.

Lecture 2 hours; laboratory 4 hours; 4 credits. Prerequisite: A microbiology course. Investigate microbiology from historical perspectives to modern molecular microbiology; ecological and biomedical components; bacteria and viruses. Laboratory will involve designing experiments conducting and evaluating results.

BIOL 707. Ecosystem Ecology. 5 Credits.

Ecological principles at ecosystem level of biological organization. Discussion of energy flow, nutrient cycling, ecosystem stability and ecosystem modeling. Laboratory involves field trips and methods of measuring ecosystem parameters. Prerequisites: a general ecology course.

BIOL 708. Ecological Sciences Seminar. 1 Credit.

A graduate seminar course in the ecological sciences. The format of the course depends on the faculty running the seminar, but most seminars involve student-led discussions on current research articles.

BIOL 712. Biological Microscopy. 4 Credits.

Prerequisites: permission of the instructor. Lectures will cover theory and concepts of specimen preparation and operation of various microscopes used in the biological sciences. The laboratory experience will include specimen preparation to viewing.

BIOL 714. Biomedical Sciences Laboratory. 2 Credits.

2 credits. Prerequisite: approval of the program director. Three laboratory rotations (6 credits) are required by the curriculum.

BIOL 715. Biomedical Sciences Laboratory. 2 Credits.**BIOL 716. Endocrinology. 5 Credits.**

The biochemical integration of hormones and related agents on vertebrate physiology with emphasis on human endocrinology. Recent literature will be stressed.

BIOL 720. Systematic Ichthyology. 3 Credits.

A systematic survey of fishes emphasizing life history, anatomy, identification and classification. Prerequisites: BIOL 520.

BIOL 724. Neuromuscular Physiology. 3 Credits.

This course will provide a comprehensive discussion of the physiological and chemical properties of nerve and muscle cells.

BIOL 730. Emerging Infectious Diseases. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: A microbiology course. Discussion on current studies into new and reemerging infectious diseases with an examination of the infectious agent and factors involved in disease emergence, prevention and elimination.

BIOL 731. Systematics and Speciation. 3 Credits.

Principles of systematic biology and discussion of speciation theory, with emphasis on generation, analysis, and interpretation of taxonomic data and application of these data to a better understanding of classification and speciation processes. Modern theories of evolutionary biology and phylogenetics will be stressed. A research paper is required.

BIOL 732. GIS in the Life Sciences. 3 Credits.

This course is designed to introduce students to geographic information systems through examples and applications in the life sciences.

BIOL 745. Advanced Immunology. 3 Credits.

Lecture 3 hours; 3 credits. Current concepts in cellular and molecular immunology and host defense based on critical review of the primary literature.

BIOL 749. Biogeography. 3 Credits.

Emphasis on historical biogeography, utilizing both dispersal and vicariance models for explanations of the geographic distribution of organisms. Ecological explanations are also considered. Useful techniques for biogeographic analyses, such as comparison of area cladograms are discussed at length.

BIOL 750. Marine Benthic Ecology. 4 Credits.

Application of ecological principles at the community level to marine benthic environments. Discussion of community structure, animal-sediment relationships, roles of benthic communities in marine ecosystems. Prerequisites: BIOL 515 or equivalent.

BIOL 751. Advanced Practices in Ethnobotany. 3 Credits.

The major objective of this course is modern methods used to study plants influencing human culture. Objectives include plant systematics and applications of DNA bar coding and fingerprinting; phytochemical techniques in drug discovery and food supplements; intellectual property rights; ecological methods for sustainable harvesting of natural products; the ethnobotanical interview and questionnaire development; methods for studying crop origins, history, and development; archeobotany; mining historical data; and importance of identification, vouching, efficacy, and conservation. This course provides a survey of interdisciplinary methodologies used in modern ethnobotanical research. A multi-day field trip is a required component.

BIOL 754. Phylogeny and Molecular Lecture and Laboratory. 5 Credits.

This course is intended to be an introduction to the processes and procedures used to reconstruct the evolutionary history of living organisms. Topics include project planning, sampling strategies, molecular techniques, and analytical and tree-building programs used to infer phylogeny. Lab provides computer experience in multiple phylogenetic software packages. Prerequisites: Instructor approval required.

BIOL 755. Molecular Genetics. 3 Credits.

Current molecular understanding of genetic processes will be reviewed. Applications to areas such as development and evolution will also be covered. Prerequisites: Graduate standing and BIOL 523.

BIOL 756. Phylogeny and Molecular Systematics. 5 Credits.

This course is intended to be an introduction to the processes and procedures used to reconstruct the evolutionary history of living organisms. Topics include project planning, sampling strategies, molecular techniques, and analytical and tree-building programs used to infer phylogeny. Lab provides computer experience in multiple phylogenetic software packages.

BIOL 758. Molecular Ecology. 4 Credits.

Scientists are increasingly using molecular methods to help them address fundamental questions in the population ecology and evolution of biological species. This class will introduce graduate students to the basic concepts and methods in molecular evolution, phylogenetics and methods into their research. Theory and concepts from lecture will be illustrated through reading and discussion of current scientific literature. Students will also directly apply the course material to a class project investigating population structure of marine species from the tropical Indo-Pacific, for which they will be trained in methods of DNA extraction, PCR and sequencing. They will present their results orally in a mini-symposium at the end of the course. Prerequisites: BIOL 671.

BIOL 759. Foundations and Principles in Ecology. 3 Credits.

A survey of the seminal ideas and perspectives in historical and contemporary ecology. The course is designed to provide a broad overview of the important theoretical and conceptual paradigms in ecology.

BIOL 770. Advanced Study in Biology. 3 Credits.

Tutorial; 3 credits. Under the guidance of members of the graduate faculty and with the approval of the program track coordinator, the student will carry out in-depth studies of selected topics relevant to the area of specialization. Extensive surveys and analyses of the literature. Written reviews, comprehensive and synoptic, and oral presentations are required of each student.

BIOL 771. Vector-Borne Diseases. 3 Credits.

Lecture, 3 hours; 3 credits. Study of the role of insects, ticks and other invertebrates in the transmission of disease. Different areas of disease transmission will be examined, including physiological and biochemical aspects of microbial survival in the vector and transmission to vertebrate hosts, as well as ecological aspects.

BIOL 772. Modeling and Simulation in the Life Sciences. 4 Credits.

Course is designed to introduce students to modeling and simulation techniques using examples and applications in the life sciences.

BIOL 775. Grant Writing for the Life Sciences. 3 Credits.

Provides students with the skills to write competitive grant proposals to both private and federal funding sources (emphasis on NIH and NSF). Students will learn how to find the most appropriate funding mechanisms and how to position themselves to be competitive. Different grant writing formats will be illustrated through proposal development projects.

BIOL 789. Gross Anatomy. 6 Credits.

An intense study of all systems from a regional approach. Extensive dissections required in lab. Clinical applications utilized. Prerequisites: An anatomy course recommended.

BIOL 795. Special Topics in Biology. 1-4 Credits.

1-4 credits. Prerequisite: permission of the instructor.

BIOL 800. Cardiovascular Physiology. 4 Credits.

4 credits. This physiology course will focus solely on Cardiovascular Physiology. Lectures will focus on basic and advanced cardiovascular principles. The laboratory will focus on the use of current cardiovascular research.

BIOL 801. Practical Computing for Biology. 3 Credits.

This hands-on training course emphasizes the use of general computing tools to work more effectively in the biological sciences. It integrates a broad range of powerful and flexible tools that are applicable to ecologists, molecular biologists, physiologists, and anyone who has struggled analyzing large or complex data sets. Text file manipulation with regular expressions, basic shell scripting, programming in Python and R, interaction with remote devices, and basic graphical concepts will be reviewed.

BIOL 802. Biomedical Sciences Journal Club. 1 Credit.

1 credit. Review and discussion of current papers in the areas of biomedical sciences. Student presentation, discussions and readings in this field required.

BIOL 805. Advanced Microbiology. 4 Credits.

Lecture 2 hours; laboratory 4 hours; 4 credits. Prerequisite: A microbiology course. Investigate microbiology from historical perspectives to modern molecular microbiology; ecological and biomedical components; bacteria and viruses. Laboratory will involve designing experiments conducting and evaluating results.

BIOL 807. Ecosystem Ecology. 5 Credits.

Ecological principles at ecosystem level of biological organization. Discussion of energy flow, nutrient cycling, ecosystem stability and ecosystem modeling. Laboratory involves field trips and methods of measuring ecosystem parameters. Prerequisites: a general ecology course.

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A graduate seminar course in the ecological sciences. The format of the course depends on the faculty running the seminar, but most seminars involve student-led discussions on current research articles.

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BIOL 814. Biomedical Sciences Laboratory. 2 Credits.

2 credits. Prerequisite: approval of the program director. Three laboratory rotations (6 credits) are required by the curriculum.

BIOL 816. Endocrinology. 5 Credits.

The biochemical integration of hormones and related agents on vertebrate physiology with emphasis on human endocrinology. Recent literature will be stressed.

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A systematic survey of fishes emphasizing life history, anatomy, identification and classification. Prerequisites: BIOL 520.

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This course will provide a comprehensive discussion of the physiological and chemical properties of nerve and muscle cells.

BIOL 830. Emerging Infectious Diseases. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: A microbiology course. Discussion on current studies into new and reemerging infectious diseases with an examination of the infectious agent and factors involved in disease emergence, prevention and elimination.

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Lecture 3 hours; 3 credits. Current concepts in cellular and molecular immunology and host defense based on critical review of the primary literature.

BIOL 849. Biogeography. 3 Credits.

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BIOL 850. Marine Benthic Ecology. 4 Credits.

Application of ecological principles at the community level to marine benthic environments. Discussion of community structure, animal-sediment relationships, roles of benthic communities in marine ecosystems. Prerequisites: BIOL 515 or equivalent.

BIOL 851. Advanced Practices in Ethnobotany. 3 Credits.

The major objective of this course is modern methods used to study plants influencing human culture. Objectives include plant systematics and applications of DNA bar coding and fingerprinting; phytochemical techniques in drug discovery and food supplements; intellectual property rights; ecological methods for sustainable harvesting of natural products; the ethnobotanical interview and questionnaire development; methods for studying crop origins, history, and development; archeobotany; mining historical data; and importance of identification, vouching, efficacy, and conservation. This course provides a survey of interdisciplinary methodologies used in modern ethnobotanical research. A multi-day field trip is a required component.

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BIOL 855. Molecular Genetics. 3 Credits.

Current molecular understanding of genetic processes will be reviewed. Applications to areas such as development and evolution will also be covered. Prerequisites: graduate standing and BIOL 523.

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BIOL 859. Foundations and Principles in Ecology. 3 Credits.

A survey of the seminal ideas and perspectives in historical and contemporary ecology. The course is designed to provide a broad overview of the important theoretical and conceptual paradigms in ecology.

BIOL 861. Ecological Sciences Internship. 3-6 Credits.

Internship experience. Prerequisites: approval of advisory committee.

BIOL 871. Vector-Borne Diseases. 3 Credits.

Lecture, 3 hours; 3 credits. Study of the role of insects, ticks and other invertebrates in the transmission of disease. Different areas of disease transmission will be examined, including physiological and biochemical aspects of microbial survival in the vector and transmission to vertebrate hosts, as well as ecological aspects.

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Course is designed to introduce students to modeling and simulation techniques using examples and applications in the life sciences.

BIOL 875. Grant Writing for the Life Sciences. 3 Credits.

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BIOL 880. Advanced Study in Biology. 3 Credits.

Tutorial; 3 credits. Under the guidance of members of the graduate faculty and with the approval of the program track coordinator, the student will carry out in-depth studies of selected topics relevant to the area of specialization. Extensive surveys and analyses of the literature. Written reviews, comprehensive and synoptic, and oral presentations are required of each student.

BIOL 889. Gross Anatomy. 6 Credits.

An intense study of all systems from a regional approach. Extensive dissections required in lab. Clinical applications utilized. Prerequisites: Anatomy and Physiology course.

BIOL 895. Special Topics in Biology. 1-4 Credits.

1-4 credits. Prerequisite: permission of the instructor.

BIOL 898. Research in Biology. 1-6 Credits.**BIOL 899. Dissertation. 1-6 Credits.****BIOL 999. Biological Sciences 999. 1 Credit.**

1 credit. A one-hour pass/fail registration required of all graduate students to maintain active status during the final semester prior to graduation. After successfully passing the candidacy examination, all doctoral students are required to be registered for at least one graduate credit each term until the degree is complete.

BME - Biomedical Engineering

BIOMEDICAL ENGINEERING Courses

BME 501. Biomedical Engineering I: Principles. 3 Credits.

The course exposes students to principles used in biomedical engineering. Areas discussed include modeling of physiological processes, biomedical signal acquisition and processing, biomaterials, rehabilitation engineering, and ethical principles in biomedical engineering.

BME 502. Biomedical Engineering II: Applications. 3 Credits.

The course is a continuation of BME 501. Students are exposed to modern biomedical engineering applications aligned with the principles and physiological processes covered in the previous course. Selected topics include: prosthetic devices, tissue engineering, neural interfaces, cardiac devices, and imaging techniques. Prerequisite: BME 401 or BME 501.

BME 505. Biomechanics. 3 Credits.

This course will discuss methods of quantitative analysis of biological forces and materials that produce human movement. Kinematics, force analysis of joints, the measurement of mechanical properties and the development and understanding of models of the biological materials incorporating structure and composition will be emphasized. Prerequisite: permission of the instructor.

BME 508. Microfluidics. 3 Credits.

This course discusses theory of fluids on the macro-micro-and nano-scales, and devices that use small volumes of fluid for biomedical applications including diagnostics and cellular control. Topics include microscale fluid mechanics, heat and mass transfer, advanced micro/nanotechnology, and methods used in modern fluid dynamics projects.

BME 510. Biomedical Instrumentation. 3 Credits.

This course will expose students to fundamentals of medical instrumentation including biosensors, transducers, biomedical signals, signal processing and electrical safety. Instruments for biomedical measurements of cardiovascular, respiratory, and other vital functions will be fabricated and tested in laboratory exercises. Biomedical applications will be discussed.

BME 554. Introduction to Bioelectrics. 3 Credits.

This course covers the electrical properties of cells and tissues as well as the use of electrical and magnetic signals and stimuli in the diagnosis and treatment of disease. Typical topics to be covered include basic cell physiology, endogenous electric fields in the body, electrocardiography, cardiac pacing defibrillation, electrotherapy, electroporation, electrotherapy in wound healing. In addition ultra-short electrical pulses for intracellular manipulation and the application of plasmas to biological systems will be covered.

BME 630. Advanced Bioelectrics. 3 Credits.

Lecture, 3 hours; 3 credits. A one-semester course covering advanced topics in bioelectrics. The course will cover advanced applications of pulsed power and plasma in the medical, biological and environmental fields. (Cross listed with ENGN 630).

BME 720. Modern Biomedical Instrumentation. 3 Credits.

Lecture, 3 hours. 3 credits. This course covers the design of modern biomedical instruments including select diagnostic, assistive, therapeutic, prosthetic, imaging, and virtual devices and systems. Techniques for mechanical, electrical, and chemical sensor and transducer design; stimulation and measurement; data acquisition; digital signal processing; and data visualization will be examined.

BME 721. Quantitative Analysis of Human Physiological Systems I. 3 Credits.

Lecture, 3 hours. 3 credits. The first of a two-course series covering human physiology and pathophysiology, with an emphasis on quantitative modeling, simulation, and analysis of the function of cells, organs, and systems. This course focuses on cellular physiology, including homeostasis, membrane ion channels, excitability, calcium dynamics, and intercellular communication.

BME 722. Quantitative Analysis of Human Physiological Systems II. 3 Credits.

Lecture, 3 hours; 3 credits. Prerequisite: BME 721 or 821. The second course of a two-course series covering human physiology and pathophysiology with an emphasis on quantitative modeling, simulation, and analysis of the function of cells, organs, and systems. This course focuses on systems physiology, including the heart, respiration, muscle, kidneys, and the endocrine system.

BME 723. Engineering Consultation in Medical Technology. 3 Credits.

Lecture, 3 hours. 3 credits. The course exposes students to professional and ethical issues encountered in consulting for groups engaged in biomedical engineering innovation and design. Students consult on real world projects in areas of medical technologies or related innovations within the biomedical community. Analysis and evaluation assignments and reports on design strategies, techniques, and tools are addressed.

BME 724. Neural Engineering. 3 Credits.

Lecture, 3 hours. 3 credits. This course presents engineering techniques for the restoration and augmentation of human function via direct interactions between the nervous system and artificial devices, with particular emphasis on brain-computer interfaces. Novel interfaces, hardware and computational issues, and practical and ethical considerations will also be covered.

BME 725. Advanced Microelectrode Techniques. 3 Credits.

Lecture, 2 hours; lab, 2 hours. 3 credits. Models and measurements of cellular transmembrane voltages and extracellular biopotentials with microelectrodes and electrode arrays are described. Origins of the voltages, quantitative models for biopotentials and techniques for measurements are examined. Students fabricate microelectrodes and perform an experiment with living cells.

BME 751. Biostatistics: Fundamentals and Applications. 3 Credits.

Descriptive statistics, probability distributions and computations, estimation, hypothesis testing (one-and two-sample inferences), regression methods (simple and multiple), methods for analyzing categorical data (Fisher's exact test, McNemar's test, chi-square tests, Cochran-Mantel-Haenszel methods), analysis of variance including non-parametric alternatives, multi-sample inference. Appropriate examples will be given from health sciences and biomedical engineering. Prerequisite: Graduate status.

BME 783. Digital Image Processing. 3 Credits.

Principles and techniques of two-dimensional processing of images. Concepts of scale and spatial frequency. Image filtering in spatial and transform domains. Applications include image enhancement and restoration, image compressing, biomedical imaging for diagnosis of disease, and image segmentation for computer vision. Prerequisites: ECE 782 or ECE 882.

BME 791. Biomedical Engineering Innovation Seminar. 1-3 Credits.

Seminar, 1-3 hours; 1-3 credits. This course is for students interested in research that originates from a clinical need, is developed in the laboratory and is then implemented clinically. Seminars by healthcare professionals emphasize clinical needs. Students follow the biodesign innovation process toward creation of biotechnologies and devices that address needs.

BME 795. Special Topics in Biomedical Engineering. 1-3 Credits.

Special courses covering selected graduate-level topics in biomedical engineering.

BME 820. Modern Biomedical Instrumentation. 3 Credits.

Lecture, 3 hours. 3 credits. This course covers the design of modern biomedical instruments including select diagnostic, assistive, therapeutic, prosthetic, imaging, and virtual devices and systems. Techniques for mechanical, electrical, and chemical sensor and transducer design; stimulation and measurement; data acquisition; digital signal processing; and data visualization will be examined.

BME 821. Quantitative Analysis of Human Physiological Systems I. 3 Credits.

Lecture, 3 hours. 3 credits. The first of a two-course series covering human physiology and pathophysiology, with an emphasis on quantitative modeling, simulation, and analysis of the function of cells, organs, and systems. This course focuses on cellular physiology, including homeostasis, membrane ion channels, excitability, calcium dynamics, and intercellular communication.

BME 822. Quantitative Analysis of Human Physiological Systems II. 3 Credits.

Lecture, 3 hours; 3 credits. Prerequisite: BME 721 or 821. The second course of a two-course series covering human physiology and pathophysiology with an emphasis on quantitative modeling, simulation, and analysis of the function of cells, organs, and systems. This course focuses on systems physiology, including the heart, respiration, muscle, kidneys, and the endocrine system.

BME 823. Engineering Consultation in Medical Technology. 3 Credits.

Lecture, 3 hours. 3 credits. The course exposes students to professional and ethical issues encountered in consulting for groups engaged in biomedical engineering innovation and design. Students consult on real world projects in areas of medical technologies or related innovations within the biomedical community. Analysis and evaluation assignments and reports on design strategies, techniques, and tools are addressed.

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Descriptive statistics, probability distributions and computations, estimation, hypothesis testing (one-and two-sample inferences), regression methods (simple and multiple), methods for analyzing categorical data (Fisher's exact test, McNemar's test, chi-square tests, Cochran-Mantel-Haenszel methods), analysis of variance including non-parametric alternatives, multi-sample inference. Appropriate examples will be given from health sciences and biomedical engineering. Prerequisite: Graduate status.

BME 883. Digital Image Processing. 3 Credits.

Principles and techniques of two-dimensional processing of images. Concepts of scale and spatial frequency. Image filtering in spatial and transform domains. Applications include image enhancement and restoration, image compressing, biomedical imaging for diagnosis of disease, and image segmentation for computer vision. Prerequisites: ECE 783/883.

BME 891. Biomedical Engineering Innovation Seminar. 1-3 Credits.

Seminar. 1-3 hours; 1-3 credits. This course is for students interested in research that originates from a clinical need, is developed in the laboratory and is then implemented clinically. Seminars by healthcare professionals emphasize clinical needs. Students follow the biodesign innovation process toward creation of biotechnologies and devices that address needs.

BME 895. Special Topics in Biomedical Engineering. 1-3 Credits.

Special courses covering selected graduate-level topics in biomedical engineering.

BME 899. PHD Dissertation Research. 1-9 Credits.

1-9 credits. Directed research for the doctoral dissertation.

BME 999. BME 999. 1 Credit.

A one-hour pass/fail registration required of all graduate students to maintain active status during the final semester prior to graduation. After successfully passing the candidacy examination, all doctoral students are required to be registered for at least one graduate credit for each term until the degree is completed.

BNAL - Business Analytics

BUSINESS ANALYTICS Courses

BNAL 507. Advanced Management Science. 3 Credits.

Formulation and solution of mathematical models and their uses and limitations in business. Topics include linear, integer, and goal programming, network models, queuing, utility theory, and Markov analysis. Cases and computer solution of topics introduced in this class, as well as topics from BNAL 206 and BNAL 306, are incorporated. Prerequisites: OPMT 611 or permission of the instructor.

BNAL 532. Forecasting. 3 Credits.

Applications include both shorter term forecasting for sales and operations management as well as forecasting for long term planning. Emphasis is on statistical methods to obtain and evaluate forecasts. Statistical models are implemented using standard software such as MINITAB or EXCEL. Prerequisites: OPMT 611.

BNAL 576. Simulation Modeling and Analysis for Business Systems. 3 Credits.

Methods and techniques of digital computer simulation of business systems utilizing knowledge of data processing, statistics, probability theory and operations research. Areas of application include systems that experience waiting problems. Topics include the methodology for the construction of computer simulation models, model verification, validation, and analysis of results.

BNAL 600. Foundations of Statistics for Business and Economics. 3 Credits.

Descriptive statistics, probability and probability distributions, estimation and hypothesis testing, analysis of variance, simple and multiple regression, and introduction to times series analysis. Computer software, as a tool for problem solving, will be utilized throughout the course. Emphasis is on the interpretation, in a business context, of statistical information for both simple and complex models.

BNAL 606. Statistics for Managers. 2 Credits.

Statistical tools for solving business problems. Topics include: sampling distributions, confidence intervals, hypothesis testing, simple and multiple regressions, and time series forecasting. Emphasis is placed on the application of the tools to business problems. The Minitab Software is used to do most of the analysis. Prerequisites: Admission to the MBA Program, MBA 600, MBA 601, MBA 602, MBA 603, and MBA 604.

BNAL 610. Fundamentals of Business Analytics. 2 Credits.

This course provides students with some common tools and techniques that are deployed in business analytics. Topics include big data and related terminology, data management, working with data, and statistical and quantitative methods used in descriptive, predictive, and prescriptive analytics. Prerequisites: Admission to the MBA Program, BNAL 606, MBA 600, MBA 601, MBA 602, MBA 603, and MBA 604.

BNAL 621. Simulation Modeling for Business Systems. 3 Credits.

This course covers both the theory and application of simulation modeling and analysis to business systems. Both discrete-event and continuous simulation modeling approaches are covered, using a major commercial simulation package. Emphasis will be on the use of simulation as a tool to support business decision making. Prerequisites: BNAL 606 or BNAL 600 and instructor approval.

BNAL 6210. Simulation Modeling for Business Systems. 3 Credits.

This course covers both the theory and application of simulation modeling and analysis to business systems. Both discrete-event and continuous simulation modeling approaches are covered, using a major commercial simulation package. Emphasis will be on the use of simulation as a tool to support business decision making. Prerequisite: BNAL 606 or BNAL 600 and instructor approval.

BNAL 641. Supply Chain Management and Logistics. 3 Credits.

Prerequisites: BNAL 611. Supply chain management integrates all activities associated with the flow of materials and information from product start to customers. Examples include order processing, warehousing, inventory management, transportation and logistics, and the costs and information systems supporting these activities. Particular application is made to global logistics systems supporting port and maritime activities. Supply chain relationships can be improved through effective integration of management and via such technologies as the World Wide Web, electronic data exchange, and enterprise resource planning (ERP).

BNAL 667. Cooperative Education. 1-3 Credits.

Approval for enrollment and allowable credits are determined by the department and Career Management in the semester prior to enrollment.

BNAL 668. Internship in Business Analytics. 1-3 Credits.

Approval for enrollment and allowable credits are determined by the department and Career Management in the semester prior to enrollment.

BNAL 695. Selected Topics in Business Analytics. 3 Credits.

Prerequisites: Permission of the department chair and graduate program director. Advanced topics in business analytics offered periodically.

BNAL 697. Independent Study. 3 Credits.

Prerequisites: OPMT 611. Affords students the opportunity to undertake independent study under the direction of a faculty member.

BNAL 700. Linear Methods for Business Decisions. 1 Credit.

An introduction to matrix algebra and optimization with emphasis on those techniques necessary for mathematical analysis of advanced statistical models used in business research. Applications of use of matrix algebra for analyzing statistical models are discussed throughout the course.

BNAL 711. Multivariate Statistical Methods for Business. 3 Credits.

Prerequisites: BNAL 600 or equivalent. An applied study of statistical methods including analysis of variance, ANCOVA, multiple regression, discriminant analysis, time series regression, and exploratory factor analysis. Data analyzed using a computerized statistical package. Emphasizes development of the student's ability to use statistics for independent research.

BNAL 712. Advanced Statistical Models in Business Research. 3 Credits.

Prerequisites: BNAL 711. Advanced statistical models that are commonly encountered in business research. Topics include confirmatory factor analysis as well as structural equation modeling. Emphasis is on model development as well as use of statistical software in analyzing realistic business-oriented data sets.

BNAL 715. Multilevel Modeling in Business Research. 1 Credit.

Prerequisites: BNAL 711 or permission of the instructor. This course introduces the fundamentals of multilevel modeling. Alternative methods of analysis are discussed and critiqued. Use of specialized multilevel modeling software is demonstrated. Topics include a detailed discussion of the issues associated with variable centering. Applications to business research investigations are emphasized.

BNAL 721. Simulation Modeling for Business Systems. 3 Credits.

This course covers both the theory and application of simulation modeling and analysis to business systems. Both discrete-event and continuous simulation modeling approaches are covered, using a major commercial simulation package. Emphasis will be on the use of simulation as a tool to support business decision making. Prerequisites: BNAL 606 or STAT 330 or MSIM 601 or MSIM 611 or BNAL 476 or BNAL 576 or BNAL 722 or BNAL 822.

BNAL 722. Agent-Based Simulation and Modeling. 3 Credits.

Prerequisites: MSIM 601 or MSIM 611 or BNAL 576 or BNAL 721 or BNAL 821. This course will explore both the conceptual and technical aspects of agent-based simulation, particularly as utilized for modeling of business systems. Students will explore the roots and literature of agent-based modeling and related fields. Students will also learn to develop agent-based simulation models using a major commercial simulation package.

BNAL 796. Selected Topics in Business Analytics. 1-3 Credits.

The advanced study of selected topics not offered on a regular basis.

BNAL 800. Theoretical Foundations in ISR. 3 Credits.

Instructor approval required. A survey of research methodology in business information technology research including empirical, behavioral and computational approaches in different types of problem domains. The approach will be interdisciplinary.

BNAL 821. Simulation Modeling for Business Systems. 3 Credits.

This course covers both the theory and application of simulation modeling and analysis to business systems. Both discrete-event and continuous simulation modeling approaches are covered, using a major commercial simulation package. Emphasis will be on the use of simulation as a tool to support business decision making. Prerequisites: BNAL 606 or STAT 330 or MSIM 601 or MSIM 611 or BNAL 476 or BNAL 576 or BNAL 722 or BNAL 822.

BNAL 822. Agent-Based Simulation and Modeling. 3 Credits.

Prerequisites: MSIM 601 or MSIM 611 or BNAL 576 or BNAL 721 or BNAL 821. This course will explore both the conceptual and technical aspects of agent-based simulation, particularly as utilized for modeling of business systems. Students will explore the roots and literature of agent-based modeling and related fields. Students will also learn to develop agent-based simulation models using a major commercial simulation package.

BUSN - Business Administration

BUSINESS ADMINISTRATION Courses

BUSN 600. Foundations of Business. 12 Credits.

This course is a team-taught, integrated series of modules that addresses the basic skills and concepts required to deal with intra-organizational issues and local business challenges and opportunities within the GEMBA program. While this an inter-disciplinary course, there is special emphasis on financial and managerial accounting, the language of business, and operations management, the basis of organizational excellence. In addition, each student will learn their leadership strengths and weaknesses, and develop a personal development plan to work on during the year.

BUSN 601. Action Learning I. 3 Credits.

Under the direction of a core faculty advisor, students in the GEMBA program will propose to study a business challenge which has strategic significance to their sponsoring organization and builds on concepts and skills taught in the program. Special emphasis is placed on defining the challenge and the scope of the intended work.

BUSN 602. Organizational Issues in Business. 12 Credits.

Prerequisites: BUSN 600. This course is a team-taught, integrated series of modules that address the intermediate skills and concepts required to deal with interorganizational issues and national business challenges and opportunities within the GEMBA program. While this is an interdisciplinary course, special emphasis is placed on marketing, human resource management, and logistics. In addition, one residency period will be conducted in a country outside of the United States and students will work one-on-one with an executive coach on their personal development plans.

BUSN 603. Action Learning II. 3 Credits.

Under the direction of a core faculty advisor, students in the GEMBA program will collect and analyze data on their strategic issue. Special emphasis will be placed on reading deeply about concepts and frameworks related to the strategic issue. Prerequisites: BUSN 601.

BUSN 604. International Issues in Business. 12 Credits.

Prerequisites: BUSN 602. This course is a team-taught, integrated series of modules that address the advanced skills and concepts required to deal with global business and international business challenges and opportunities within the GEMBA program. While this is an interdisciplinary course, special emphasis will be placed on international strategies and tactics, as well as leadership and organizational change. In addition, one residency period will be conducted in a country outside of the United States and students will work one-on-one with an executive coach on their personal development plans.

BUSN 605. Action Learning III. 3 Credits.

Under the direction of a core faculty advisor, students in the GEMBA program will write up and provide an oral presentation on their strategic issue. Special emphasis will be placed on estimating the return on investment to the sponsoring organization if it adopts the strategic recommendations. Prerequisites: BUSN 603.

BUSN 800. Seminar in International Business. 3 Credits.

This course will provide students with a comprehensive understanding of the environmental issues, institutions, opportunities, challenges, problems and managerial processes that are unique to international business. Both the micro and macro contexts in which international business is conducted will be examined.

BUSN 801. Research/Teaching Colloquium. 1 Credit.

The one-hour Research/Teaching Colloquium is mainly intended to promote research/teaching competencies of doctoral students through their exposure to presentations on and discussions of various topics dealing with research, writing, publishing and effective teaching. The presentations may be by faculty members, outside speakers or doctoral students.

BUSN 999. Business. 1-10 Credits.

Pass/fail registration for graduate students.

CCL - Community College Leadership

COMMUNITY COLLEGE LEADERSHIP Courses

CCL 685. Topics in Community College Leadership. 1-3 Credits.

Topics in Community College Leadership.

CCL 695. Topics in Community College Leadership. 1-3 Credits.

TOPICS IN COMMUNITY COLLEGE LEADERSHIP.

CCL 720. Community College Leadership. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: acceptance into the doctoral program or permission of the instructor. A doctoral level seminar intended to provide theoretical and practical background on issues related to community college leadership and assist the student to develop the skills necessary to fulfill the responsibilities of a senior community college administrative leadership position. Of particular importance are skills needed for community college deans, vice presidents and presidents.

CCL 724. Community College Finance. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: acceptance into the doctoral program or permission of the instructor. A doctoral level seminar intended to provide information about the financing and budgeting processes that are practiced in community colleges. This will be accomplished by examining the budget development and budget planning process and a survey of sources and uses of funds as well as the functions and techniques of responsible management of resources.

CCL 726. Community College Curriculum and Program Development. 3 Credits.

3 credits. Prerequisite: acceptance into the doctoral program or permission of the instructor. A doctoral- level seminar intended to assist students to understand the development and management of the community college curriculum. It will do this by (1) examining processes practiced in the identification of courses and degree programs, (2) the review and approval processes of individual programs and courses, (3) assessment and other accountability activities, and (4) the authorizing processes and procedures for establishing or terminating courses or programs.

CCL 768. Internship in Community College Leadership. 3-6 Credits.

3 to 6 credits. Prerequisite: acceptance into the doctoral program or permission of the instructor. The purpose of this course is to allow students to obtain hands-on experience in a leadership role at a community college setting. The student will learn about leadership skills at the community college by observing his or her mentor/site supervisor and by being given leadership tasks associated with the site he or she has chosen.

CCL 795. Topics in Community College Leadership. 1-3 Credits.

1 to 3 credits. Prerequisite: permission of the instructor.

CCL 820. Community College Leadership. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: acceptance into the doctoral program or permission of the instructor. A doctoral level seminar intended to provide theoretical and practical background on issues related to community college leadership and assist the student to develop the skills necessary to fulfill the responsibilities of a senior community college administrative leadership position. Of particular importance are skills needed for community college deans, vice presidents and presidents.

CCL 824. Community College Finance. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: acceptance into the doctoral program or permission of the instructor. A doctoral level seminar intended to provide information about the financing and budgeting processes that are practiced in community colleges. This will be accomplished by examining the budget development and budget planning process and a survey of sources and uses of funds as well as the functions and techniques of responsible management of resources.

CCL 826. Community College Curriculum and Program Development. 3 Credits.

3 credits. Prerequisite: acceptance into the doctoral program or permission of the instructor. A doctoral- level seminar intended to assist students to understand the development and management of the community college curriculum. It will do this by (1) examining processes practiced in the identification of courses and degree programs, (2) the review and approval processes of individual programs and courses, (3) assessment and other accountability activities, and (4) the authorizing processes and procedures for establishing or terminating courses or programs.

CCL 830. Community College Politics and Policy Development. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: acceptance into the doctoral program or permission of the instructor. This course will examine the political factors that may influence educational policy-decisions at community colleges and other institutions of higher education. This course will encourage students to pursue self-directed study of the relationships community college leaders build with community college boards of trustees, county commissioners, state legislators (with emphasis on the Commonwealth of Virginia), and federal representatives. The course also will require students to research and participate in debates on current political and ethical issues affecting the community college.

CCL 868. Internship in Community College Leadership. 3-6 Credits.

3 to 6 credits. Prerequisite: acceptance into the doctoral program or permission of the instructor. The purpose of this course is to allow students to obtain hands-on experience in a leadership role at a community college setting. The student will learn about leadership skills at the community college by observing his or her mentor/site supervisor and by being given leadership tasks associated with the site he or she has chosen.

CCL 881. Dissertation Seminar. 3 Credits.

3 credits. A seminar that focuses on the design, implementation, and evaluation of community colleges under real-life conditions in the field. Students and faculty work with community college decision makers utilizing problem solving skills and analysis.

CCL 895. Topics in Community College Leadership. 1-3 Credits.

1 to 3 credits. Prerequisite: permission of the instructor.

CCL 899. Dissertation. 1-12 Credits.

1 to 12 credits.

CCL 999. Community College Leadership 999. 1 Credit.

1 credit. A one-hour pass/fail registration required of all graduate students to maintain active status during the final semester prior to graduation. After successfully passing the candidacy examination, all doctoral students are required to be registered for at least one graduate credit each term until the degree is complete.

CDSE - Communication Disorders and Special Education

COMMUNICATION DISORDERS AND SPECIAL EDUCATION Courses

CDSE 595. Topics in Education. 1-6 Credits.

Selected topics in education.

CDSE 597. Independent Study in Special Topics in Education. 1-4 Credits.

Independent study of selected topics.

CDSE 636. Problems in Education. 3 Credits.

Application of research procedures culminating in student study of selected topics. Prerequisites: FOUN 612.

CDSE 695. Topics in Education. 1-3 Credits.

This course offers selected topics designed to permit small groups of qualified students to work on subjects of mutual interest in the special education field. Prerequisite: permission of the instructor.

CDSE 699. Thesis. 3-6 Credits.

Supervised graduate student research. Prerequisites: permission of instructor.

CDSE 795. Topics in Education. 1-3 Credits.

The advanced study of selected topics and emergent research related issues that permits small groups of qualified students to study subjects of mutual interest, which, due to their specialized nature, may not be offered regularly. Prerequisite: permission of instructor.

CDSE 895. Topics in Education. 1-3 Credits.

The advanced study of selected topics and emergent research related issues that permits small groups of qualified students to study subjects of mutual interest, which, due to their specialized nature, may not be offered regularly. Prerequisite: permission of instructor.

CDSE 998. CDSE 998. 1 Credit.

CDSE 999. Communication Disorders/Special Education 999. 1 Credit.

A one-hour pass/fail registration required of all graduate students to maintain active status during the final semester prior to graduation. After successfully passing the candidacy examination, all doctoral students are required to be registered for at least one graduate credit each term until the degree is complete.

CEE - Civil and Environmental Engineering

CIVIL AND ENVIRONMENTAL ENGINEERING Courses

CEE 511. Concrete Design II. 3 Credits.

Lecture 3 hours; 3 credits. Analysis and design of complex concrete structural members, flat and two-way slabs, special topics and introduction to prestressed concrete design.

CEE 514. Masonry Structures Design. 3 Credits.

Lecture 3 hours; 3 credits. Masonry materials, reinforced beams and lintels, walls, columns and pilasters, shear walls, and buildings.

CEE 515. Steel Structures Design. 3 Credits.

Lecture 3 hours; 3 credits. Load and resistance factor design methods for steel structures.

CEE 516. Wood Structures Design. 3 Credits.

Lecture 3 hours; 3 credits. Design of wood structures based on national design specification and load and resistance factor design.

CEE 530. Foundation Engineering. 3 Credits.

Lecture 3 hours; 3 credits. Subsurface exploration, site preparation, design of shallow and deep foundations, and retaining structures.

CEE 531. Earth Structures Design with Geosynthetics. 3 Credits.

Lecture 3 hours; 3 credits. Seepage and stability analysis and design of manmade and natural slopes and retaining structures. Applications of geosynthetic material to seepage control, reinforcement of earth works, and containment of hazardous materials.

CEE 532. Introduction to Earthquake Engineering. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisites: permission of the instructor. An overview of earthquake processes and details of the characteristics of destructive ground motion; the effects of such motion on civil engineering structures; reviews of current design practice in mitigating earthquake hazards for various civil engineering structures such as buildings, bridges, dams, lifelines, ports and harbors.

CEE 540. Hydraulic Engineering. 3 Credits.

Lecture 3 hours; 3 credits. Hydraulic transients; flow control structures; computer analysis of hydraulic systems; design of pipelines, open channels and culverts.

CEE 546. Urban Stormwater Hydrology. 3 Credits.

Lecture 3 hours; 3 credits. Storm rainfall analysis, design rainfall hyetographs, runoff calculation procedures, detention basins, use of mathematical models to analyze and design urban storm drainage systems.

CEE 547. Groundwater Hydraulics. 3 Credits.

Lecture 3 hours; 3 credits. Description of well hydraulics in single and multiple well systems. Determination of aquifer parameters from pumping tests. Use of computer models to determine drawdowns due to multiple well systems.

CEE 550. Water Distribution and Wastewater Collection System Design. 3 Credits.

Lecture 3 hours; 3 credits. Design of water distribution systems, sanitary sewer systems and appurtenances.

CEE 552. Air Quality. 3 Credits.

Study of air quality management standards and regulations and pollutant dynamics. Design and operation of emission control equipment for mobile and stationary sources of air pollution.

CEE 554. Hazardous Wastes. 3 Credits.

Study of sources, generation rates and characteristics of hazardous wastes and their regulation, handling, and design of treatment and disposal facilities.

CEE 558. Sustainable Development. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: permission of instructor. Overview of social, economical, technical environmental aspects of regional, national and international efforts to achieve sustainable development. Discussion of the integration of industrial activity and ecological concerns utilizing principles of zero emissions, pollution prevention and design for the environment.

CEE 559. Biofuels Engineering. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: permission of the instructor. Course covers the overview of renewable energy sources; fundamentals of biofuels; biomass and types of biomass (e.g., woody biomass, forest residues, agricultural residues, energy crops); composition of lignocelluloses (cellulose, hemicellulose, and lignin); biomass conversion technologies; thermochemical, supercritical water, and biochemical conversion processes; types of biofuels from biomass; liquid fuels (bioethanol, bio-oil, biocrude, and hydrocarbons); gaseous fuels (synthesis gas, hydrogen, biodiesel); solid fuels (biochar, torrefied biomass); biodiesel from vegetable oils, algae to biofuels; value-added processing of biofuel residues; economic and environmental assessments; policies and future R&D.

CEE 560. Advanced Analytical Techniques in Environmental Engineering. 3 Credits.

The objective of this class is to introduce students to the analytical, experimental, and process engineering techniques that are utilized to support decision making in environmental engineering.

CEE 570. Transportation Fundamentals. 3 Credits.

Lecture 3 hours; 3 credits. This course surveys the current practice of transportation engineering in the United States. It focuses on various ground transportation modes and covers policy, institutional planning and operational issues. Students are introduced to planning models, capacity analysis, traffic impact analysis, and parking studies.

CEE 571. Transportation Operations I. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: CEE 570. This is the first course in transportation operations and traffic flow theory. Topics include traffic engineering studies, capacity analysis, intersection control, traffic flow models, shockwave analysis, signal warrant analysis, and safety analysis. Course includes applications of modeling and simulation to isolated intersections.

CEE 576. Transportation Operations Applications. 3 Credits.

Lecture 3 hours; 3 credits. This course deals with operations applications in transportation. It covers theory and practical examples of traffic engineering studies, capacity analysis, intersection control, signal warrant analysis, and safety analysis. Topics discussed also include traffic management, access management, traffic calming, and regional operations management.

CEE 582. Introduction to Coastal Engineering. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisites: permission of the instructor. Classical small amplitude wave theory, wave transformations in shallow water, shoaling, refraction, diffraction, reflection, breaking. Wave induced near shore currents and sediment transport processes. Alternatives to mitigate coastal erosion processes. Introduction to coastal structures.

CEE 595. Topics in Civil and Environmental Engineering. 1-3 Credits.

Special topics of interest with emphasis placed on recent developments in civil and/or environmental engineering. Prerequisites: Permission of the instructor.

CEE 650. Pollution Prevention. 3 Credits.

Lecture 3 hours; 3 credits. Application of engineering methods to the prevention of pollution. Review of the Pollution Prevention Act and related regulations. Study of source reduction methods analysis for manufacturing, materials, and processing changes. Pollution prevention case studies.

CEE 659. Carbon-Free Clean Energy. 3 Credits.

The course presents an overview of carbon-free energy sources (nuclear, wind, solar, hydropower, and geothermal). The current status, conversion processes, economics, and environmental issues of these forms of energy will be discussed.

CEE 667. Cooperative Education. 1-3 Credits.

1-3 credits (may be repeated for credit). Prerequisite: approval by the department and Career Management in accordance with the policy for granting credit for cooperative education programs. Available for pass/fail grading only. Student participation for credit based on the academic relevance of the work experience, criteria, and evaluative procedures as formally determined by the department and Career Management prior to the semester in which the work experience is to take place.

CEE 668. Internship. 1-3 Credits.

1-3 credits. Prerequisite: approval by department and Career Management Center. Academic requirements will be established by the department and will vary with the amount of credit desired. Allows students an opportunity to gain short duration career-related experience.

CEE 669. Practicum. 1-3 Credits.

1-3 credits. Prerequisite: approval by department and Career Management Center. Academic requirements will be established by the department and will vary with the amount of credit desired. Allows students an opportunity to gain short duration career-related experience.

CEE 695. Topics in Civil and Environmental Engineering. 1-3 Credits.

Prerequisites: Permission of the instructor. Special topics of interest with emphasis placed on recent developments in civil and/or environmental engineering.

CEE 697. Independent Study in Civil and Environmental Engineering. 1-3 Credits.

1-3 credits. Prerequisite: permission of the instructor. Individual analytical, experimental and/or design study selected by the student. Approved and supervised by the advisor.

CEE 698. Master's Project. 1-3 Credits.

1-3 credits. Individual project, investigation under the direction of the student's major professor.

CEE 699. Thesis. 1-6 Credits.

1-6 credits. Research leading to the Master of Science thesis.

CEE 700. Civil and Environmental Engineering Experimental Design. 3 Credits.

Lecture 3 hours; 3 credits. Graduate-level overview of engineering experimental design and analysis with emphasis on statistical methods; practical and proper statistical methods applicable to multidisciplinary, real-world civil and environmental engineering problems.

CEE 710. Structural Dynamics. 3 Credits.

Lecture 3 hours; 3 credits. Free and forced vibration of discrete and continuous systems; elastic and inelastic response of structures under dynamic loads.

CEE 711. Finite Element Analysis. 3 Credits.

Lecture 3 hours; 3 credits. To provide an understanding of the finite element method (FEM) as derived from an integral formulation perspective. To demonstrate the solutions of (1-D and 2-D) continuum mechanics problems such as solid mechanics, fluid mechanics and heat transfer.

CEE 712. Advanced Reinforced Concrete. 3 Credits.

Lecture 3 hours; 3 credits. Ultimate-strength theory, yield line methods, limit design, and other relevant advanced topics in the theory and design of concrete structures.

CEE 713. Prestressed Concrete. 3 Credits.

Lecture 3 hours; 3 credits. Analysis and design of prestressed concrete members and structures. Shrinkage, creep and losses, shear, bond and anchorages are discussed.

CEE 714. Advanced Structural Analysis. 3 Credits.

Lecture 3 hours; 3 credits. Elastic analysis of framed structures using matrix and numerical techniques.

CEE 715. Engineering Optimization I. 3 Credits.

Lecture 3 hours; 3 credits. Formulation and solution algorithms for Linear Programming (LP) problems. Unconstrained and constrained nonlinear programming (NLP) problems. Optimum solution for practical engineering systems. (Cross-listed with ME 715/815.).

CEE 717. Bridge Structures Design. 3 Credits.

Lecture 3 hours; 3 credits. Design of steel, concrete, and composite bridges using modern techniques and current specifications.

CEE 719. Inelastic Structures. 3 Credits.

Lecture 3 hours; 3 credits. Inelastic analysis and behavior of framed structures.

CEE 720. Structural Stability. 3 Credits.

Lecture 3 hours; 3 credits. Fundamentals of elastic and inelastic stability of beams, columns and frames.

CEE 721. Plates. 3 Credits.

Lecture 3 hours; 3 credits. Classical and modern methods for the solution of plates of various shapes and boundary conditions, continuous and axially loaded plates and plates on elastic supports. Design examples.

CEE 722. Cluster Parallel Computing. 3 Credits.

Lecture 3 hours; 3 credits. Detailed numerical step-by-step procedures to exploit parallel and sparse computation under MPI (Message, Passing, Interface) computer environments are explained. Large-scale engineering/science applications are emphasized. Simultaneous linear equations are discussed.

CEE 723. Seismic Design of Steel Structures. 3 Credits.

Lecture 3 hours; 3 credits. Analysis and design of steel structures under seismic loading conditions, introduction to design specifications for steel structures.

CEE 724. Retrofitting Methods for Bridges and Buildings. 3 Credits.

Retrofitting methods for bridges and buildings combined with related advanced structural analysis and design techniques.

CEE 730. Advanced Foundation Engineering. 3 Credits.

Lecture 3 hours; 3 credits. Advanced analysis and design of shallow and deep foundations and retaining structures.

CEE 731. Advanced Soil Mechanics. 3 Credits.

Lecture 3 hours; 3 credits. Detailed study of shear strength of soils and its application to slope stability and embankment design and analysis. Advanced laboratory shear tests are included.

CEE 732. Engineering Behavior of Soils. 3 Credits.

Lecture 3 hours; 3 credits. Detailed study of physicochemical behavior of soils, fabric, rheology, effective stress path, and their applications to various geotechnical engineering problems.

CEE 733. Soil Dynamics. 3 Credits.

Lecture 3 hours; 3 credits. Study of soil behavior under dynamic loadings. Laboratory and field techniques for determining soil properties and liquefaction potential. Design examples.

CEE 741. Open Channel Flow. 3 Credits.

Lecture 3 hours; 3 credits. Momentum and energy principles, design of open channels, use of mathematical models for flow calculations in rivers, introduction to unsteady open channel flow.

CEE 747. Groundwater Flow. 3 Credits.

Lecture 3 hours; 3 credits. Mathematical formulations of laws governing groundwater flow and contaminant transport. Unsaturated flow. Use of computer models for modeling groundwater aquifers.

CEE 751. Physicochemical Treatment Processes. 3 Credits.

Lecture 3 hours; 3 credits. Physical and chemical processes used in the treatment of water and waste water are covered. Separation, isolation and reaction processes are characterized as well as reactor engineering.

CEE 752. Biological Wastewater Treatment. 3 Credits.

Lecture 3 hours; 3 credits. The use of microorganisms to treat domestic and industrial waste waters for organics and nutrient removal are studied. Characteristics of individual waste water components and the appropriate treatment processes to remove these components are covered.

CEE 753. Advanced Processes for Water and Wastewater Treatment. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisites: CEE 751 and 752. Theory, operation and application of advanced water and waste water treatment systems, including land application, dissolved solids, organic contaminant and nutrient removal processes. Emphasis on system development for waste water reclamation/recycling.

CEE 754. Environmental Engineering Microbiology. 3 Credits.

Lecture 2 hours; laboratory 2 hours; 3 credits. A lecture and laboratory course dealing with the study of the principles and applications of microbiology in waste water treatment, water treatment, stream self-purification and their effects in environmental engineering.

CEE 755. Water Quality Management. 3 Credits.

Characterization of water quality in natural systems and the human activities that result in contaminant input to these systems are studied. Management practices for minimizing contaminant input and for restoring contaminated waters are discussed.

CEE 756. Water Quality Modeling. 3 Credits.

Lecture 3 hours; 3 credits. Formulation of mathematical equations to describe the fate and transport of aqueous contaminants in dynamic surface water systems. Use of water quality computer models to predict various contamination scenarios.

CEE 761. Water Resources Process and Analysis Methods. 3 Credits.

Interactive hydrologic processes in water resource; modifications of climate change to these processes; modern simulation and systematic analysis methods incorporating the modifications into practices of water resource planning, utilization, protection, and engineering.

CEE 762. Aquatic Chemistry in Environmental Engineering. 3 Credits.

Lecture 3 hours; 3 credits. Chemical reactions in natural and engineered systems are studied with emphasis placed on developing kinetic expressions and assessing chemical equilibrium. Kinetic and equilibrium expressions are applied to engineering problems to predict the reaction time and products of specific reactions.

CEE 770. Transportation Safety. 3 Credits.

Lecture 3 hours; 3 credits. This course focuses on major transportation safety issues including transportation safety goals, safety of various transportation modes, identification of problematic locations, selection of safety countermeasures and their evaluation, safety data and modeling issues.

CEE 771. Transportation Operations II. 3 Credits.

Lecture 3 hours; 3 credits. This is the second course in transportation operations and traffic flow theory. Topics covered include design of progressive signal systems, queuing theory, car following models, and applications of microscopic traffic simulation to corridor studies.

CEE 772. Intelligent Transportation Systems. 3 Credits.

Lecture 3 hours; 3 credits. This course examines how ITS can be used to enhance mobility and safety. The topics covered in the course include systems engineering approach to ITS, traveler response to technologies and information, ITS planning and evaluation, and ITS deployment and operational performance.

CEE 773. Transportation Planning. 3 Credits.

This course covers transportation planning processes that include policy direction, transportation data, travel demand forecasting models, and decision-making/stakeholders issues.

CEE 774. Transportation Network Flow Models. 3 Credits.

This course provides a rigorous introduction to transportation network modeling, with special emphasis on network equilibrium problems. Topics include: elementary graph theory, shortest path problem nonlinear optimization, optimization of univariate functions, deterministic and stochastic user equilibrium.

CEE 775. Computational Methods for Transportation Systems. 3 Credits.

Fundamental models and algorithms in optimization, stochastic modeling and parallel computing will be discussed and illustrated with transportation applications.

CEE 776. Simulation in Transportation Networks. 3 Credits.

Lecture 3 hours; 3 credits. Principles of simulation modeling. Microscopic, mesoscopic and macroscopic traffic simulation models. Driver behavior in networks. Calibration and validation of traffic simulation models. Traffic simulation software.

CEE 782. Design of Coastal Structures. 3 Credits.

Lecture 3 hours; 3 credits. Nonlinear wave theories; wave forces on slender piles and seawalls; design of rubblemound structures; design philosophy, initial costs, maintenance costs, optimized design using stochastic methods; design of renourished beaches. Advanced alternative solutions for shore protection.

CEE 783. Tidal Hydraulics in the Estuarine and Coastal Environment. 3 Credits.

This course introduces fundamental theories of estuarine hydraulics and processes, including classification of estuaries, estuarine hydrodynamics (waves and tides), along-/cross-channel momentum balances, estuarine variability, mixing and stratification in estuaries, wave-current interactions, flushing and fronts in estuaries as well as saltwater intrusion.

CEE 787. Dredging and Beach Engineering. 3 Credits.

Lecture 3 hours; 3 credits. Types of dredges, factors affecting dredge performance; hydraulic dredges (cutter, hopper) and mechanical dredges systems (bucket, clamshell, etc.); shoaling rate determination; inlet sand bypassing systems; beach renourishment schemes. Design of beach renourishment/projects.

CEE 788. Coastal Hydrodynamics and Sediment Transport Processes. 3 Credits.

Lecture 3 hours; 3 credits. Time averaging wind waves and radiation stresses. Wave setup, longshore currents, rip currents and nearshore circulation. Theoretical models for regular (monochromatic) and irregular waves. Wave energy dissipation models in surf zones. Vertical structure and undertow models. Sediment concentration and transport models for predicting bathymetric change.

CEE 789. Computational Environmental Fluid Dynamics. 3 Credits.

Lecture 3 hours; 3 credits. Fluid dynamics conservation laws as transport phenomena. Classical, finite-difference models for advection, diffusion and combined fluid flows. Explicit and implicit schemes to solve unsteady, free-surface fluid flow and diffusion (dispersion) problems in one and multi-dimensions. Turbulence models.

CEE 795. Topics in Civil and Environmental Engineering. 1-3 Credits.

Special topics of interest with emphasis placed on recent developments in civil and/or environmental engineering. Prerequisites: Permission of the instructor.

CEE 797. Independent Study. 1-3 Credits.

CEE 800. Civil and Environmental Engineering Experimental Design. 3 Credits.

Lecture 3 hours; 3 credits. Graduate-level overview of engineering experimental design and analysis with emphasis on statistical methods; practical and proper statistical methods applicable to multidisciplinary, real-world civil and environmental engineering problems.

CEE 810. Structural Dynamics. 3 Credits.

Lecture 3 hours; 3 credits. Free and forced vibration of discrete and continuous systems; elastic and inelastic response of structures under dynamic loads.

CEE 811. Finite Element Analysis. 3 Credits.

Lecture 3 hours; 3 credits. To provide an understanding of the finite element method (FEM) as derived from an integral formulation perspective. To demonstrate the solutions of (1-D and 2-D) continuum mechanics problems such as solid mechanics, fluid mechanics and heat transfer.

CEE 812. Advanced Reinforced Concrete. 3 Credits.

Lecture 3 hours; 3 credits. Ultimate-strength theory, yield line methods, limit design, and other relevant advanced topics in the theory and design of concrete structures.

CEE 813. Prestressed Concrete. 3 Credits.

Lecture 3 hours; 3 credits. Analysis and design of prestressed concrete members and structures. Shrinkage, creep and losses, shear, bond and anchorages are discussed.

CEE 814. Advanced Structural Analysis. 3 Credits.

Lecture 3 hours; 3 credits. Elastic analysis of framed structures using matrix and numerical techniques.

CEE 815. Engineering Optimization I. 3 Credits.

Lecture 3 hours; 3 credits. Formulation and solution algorithms for Linear Programming (LP) problems. Unconstrained and constrained nonlinear programming (NLP) problems. Optimum solution for practical engineering systems. (Cross-listed with ME 715/815.)

CEE 817. Bridge Structures Design. 3 Credits.

Lecture 3 hours; 3 credits. Design of steel, concrete, and composite bridges using modern techniques and current specifications.

CEE 819. Inelastic Structures. 3 Credits.

Lecture 3 hours; 3 credits. Inelastic analysis and behavior of framed structures.

CEE 820. Structural Stability. 3 Credits.

Lecture 3 hours; 3 credits. Fundamentals of elastic and inelastic stability of beams, columns and frames.

CEE 821. Plates. 3 Credits.

Lecture 3 hours; 3 credits. Classical and modern methods for the solution of plates of various shapes and boundary conditions, continuous and axially loaded plates and plates on elastic supports. Design examples.

CEE 822. Cluster Parallel Computing. 3 Credits.

Lecture 3 hours; 3 credits. Detailed numerical step-by-step procedures to exploit parallel and sparse computation under MPI (Message, Passing, Interface) computer environments are explained. Large-scale engineering/science applications are emphasized. Simultaneous linear equations are discussed.

CEE 823. Seismic Design of Steel Structures. 3 Credits.

Lecture 3 hours; 3 credits. Analysis and design of steel structures under seismic loading conditions, introduction to design specifications for steel structures.

CEE 824. Retrofitting Methods for Bridges and Buildings. 3 Credits.

Retrofitting methods for bridges and buildings combined with related advanced structural analysis and design techniques.

CEE 830. Advanced Foundation Engineering. 3 Credits.

Lecture 3 hours; 3 credits. Advanced analysis and design of shallow and deep foundations and retaining structures.

CEE 831. Advanced Soil Mechanics. 3 Credits.

Lecture 3 hours; 3 credits. Detailed study of shear strength of soils and its application to slope stability and embankment design and analysis. Advanced laboratory shear tests are included.

CEE 832. Engineering Behavior of Soils. 3 Credits.

Lecture 3 hours; 3 credits. Detailed study of physiochemical behavior of soils, fabric, rheology, effective stress path, and their applications to various geotechnical engineering problems.

CEE 833. Soil Dynamics. 3 Credits.

Lecture 3 hours; 3 credits. Study of soil behavior under dynamic loadings. Laboratory and field techniques for determining soil properties and liquefaction potential. Design examples.

CEE 841. Open Channel Flow. 3 Credits.

Lecture 3 hours; 3 credits. Momentum and energy principles, design of open channels, use of mathematical models for flow calculations in rivers, introduction to unsteady open channel flow.

CEE 847. Groundwater Flow. 3 Credits.

Lecture 3 hours; 3 credits. Mathematical formulations of laws governing groundwater flow and contaminant transport. Unsaturated flow. Use of computer models for modeling groundwater aquifers.

CEE 851. Physiochemical Treatment Processes. 3 Credits.

Lecture 3 hours; 3 credits. Physical and chemical processes used in the treatment of water and waste water are covered. Separation, isolation and reaction processes are characterized as well as reactor engineering.

CEE 852. Biological Wastewater Treatment. 3 Credits.

Lecture 3 hours; 3 credits. The use of microorganisms to treat domestic and industrial waste waters for organics and nutrient removal are studied. Characteristics of individual waste water components and the appropriate treatment processes to remove these components are covered.

CEE 853. Advanced Processes for Water and Wastewater Treatment. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisites: CEE 751 and 752. Theory, operation and application of advanced water and waste water treatment systems, including land application, dissolved solids, organic contaminant and nutrient removal processes. Emphasis on system development for waste water reclamation/recycling.

CEE 854. Environmental Engineering Microbiology. 3 Credits.

Lecture 2 hours; laboratory 2 hours; 3 credits. A lecture and laboratory course dealing with the study of the principles and applications of microbiology in waste water treatment, water treatment, stream self-purification and their effects in environmental engineering.

CEE 855. Water Quality Management. 3 Credits.

Characterization of water quality in natural systems and the human activities that result in contaminant input to these systems are studied. Management practices for minimizing contaminant input and for restoring contaminated waters are discussed.

CEE 856. Water Quality Modeling. 3 Credits.

Lecture 3 hours; 3 credits. Formulation of mathematical equations to describe the fate and transport of aqueous contaminants in dynamic surface water systems. Use of water quality computer models to predict various contamination scenarios.

CEE 861. Water Resources Processes and Analysis Methods. 3 Credits.

Interactive hydrologic processes in water resource; modifications of climate change to these processes; modern simulation and systematic analysis methods incorporating the modifications into practices of water resource planning, utilization, protection, and engineering.

CEE 862. Aquatic Chemistry in Environmental Engineering. 3 Credits.

Lecture 3 hours; 3 credits. Chemical reactions in natural and engineered systems are studied with emphasis placed on developing kinetic expressions and assessing chemical equilibrium. Kinetic and equilibrium expressions are applied to engineering problems to predict the reaction time and products of specific reactions.

CEE 870. Transportation Safety. 3 Credits.

Lecture 3 hours; 3 credits. This course focuses on major transportation safety issues including transportation safety goals, safety of various transportation modes, identification of problematic locations, selection of safety countermeasures and their evaluation, safety data and modeling issues.

CEE 871. Transportation Operations II. 3 Credits.

Lecture 3 hours; 3 credits. This is the second course in transportation operations and traffic flow theory. Topics covered include design of progressive signal systems, queuing theory, car following models, and applications of microscopic traffic simulation to corridor studies.

CEE 872. Intelligent Transportation Systems. 3 Credits.

Lecture 3 hours; 3 credits. This course examines how ITS can be used to enhance mobility and safety. The topics covered in the course include systems engineering approach to ITS, traveler response to technologies and information, ITS planning and evaluation, and ITS deployment and operational performance.

CEE 873. Transportation Planning. 3 Credits.

This course covers transportation planning processes that include policy direction, transportation data, travel demand forecasting models, and decision-making/stakeholders issues.

CEE 874. Transportation Network Flow Models. 3 Credits.

This course provides a rigorous introduction to transportation network modeling, with special emphasis on network equilibrium problems. Topics include: elementary graph theory, shortest path problem nonlinear optimization, optimization of univariate functions, deterministic and stochastic user equilibrium.

CEE 875. Computational Methods for Transportation Systems. 3 Credits.

Fundamental models and algorithms in optimization, stochastic modeling and parallel computing will be discussed and illustrated with transportation applications.

CEE 876. Simulation in Transportation Networks. 3 Credits.

Lecture 3 hours; 3 credits. Principles of simulation modeling. Microscopic, mesoscopic and macroscopic traffic simulation models. Driver behavior in networks. Calibration and validation of traffic simulation models. Traffic simulation software.

CEE 882. Design of Coastal Structures. 3 Credits.

Lecture 3 hours; 3 credits. Nonlinear wave theories; wave forces on slender piles and seawalls; design of rubblemound structures; design philosophy, initial costs, maintenance costs, optimized design using stochastic methods; design of renourished beaches. Advanced alternative solutions for shore protection.

CEE 883. Tidal Hydraulics in the Estuarine and Coastal Environment. 3 Credits.

This course introduces fundamental theories of estuarine hydraulics and processes, including classification of estuaries, estuarine hydrodynamics (waves and tides), along-/cross-channel momentum balances, estuarine variability, mixing and stratification in estuaries, wave-current interactions, flushing and fronts in estuaries as well as saltwater intrusion.

CEE 887. Dredging and Beach Engineering. 3 Credits.

Lecture 3 hours; 3 credits. Types of dredges, factors affecting dredge performance; hydraulic dredges (cutter, hopper) and mechanical dredges systems (bucket, clamshell, etc.); shoaling rate determination; inlet sand bypassing systems; beach renourishment schemes. Design of beach renourishment/projects.

CEE 888. Coastal Hydrodynamics and Sediment Transport Processes. 3 Credits.

Lecture 3 hours; 3 credits. Time averaging wind waves and radiation stresses. Wave setup, longshore currents, rip currents and nearshore circulation. Theoretical models for regular (monochromatic) and irregular waves. Wave energy dissipation models in surf zones. Vertical structure and undertow models. Sediment concentration and transport models for predicting bathymetric change.

CEE 889. Computational Environmental Fluid Dynamics. 3 Credits.

Lecture 3 hours; 3 credits. Fluid dynamics conservation laws as transport phenomena. Classical, finite-difference models for advection, diffusion and combined fluid flows. Explicit and implicit schemes to solve unsteady, free-surface fluid flow and diffusion (dispersion) problems in one and multi-dimensions. Turbulence models.

CEE 892. Doctor of Engineering Project. 1-12 Credits.

1-9 credits. Directed individual study applying advanced level technical knowledge to identify, formulate, and solve a complex, novel problem in Civil and Environmental Engineering.

CEE 895. Topics in Civil and Environmental Engineering. 1-3 Credits.

Special topics of interest with emphasis placed on recent developments in civil and/or environmental engineering. Prerequisites: Permission of the instructor.

CEE 897. Independent Study. 1-3 Credits.

1-3 credits. Prerequisite: permission of the instructor. Individual analytical, experimental and/or design study selected by the student. Approved and supervised by the advisor.

CEE 899. Dissertation Research. 1-9 Credits.

1-9 credits.

CEE 999. Civil Engineering 999. 1 Credit.

1 credit. A one-hour pass/fail registration required of all graduate students to maintain active status during the final semester prior to graduation. After successfully passing the candidacy examination, all doctoral students are required to be registered for at least one graduate credit each term until the degree is complete.

CHEM - Chemistry and Biochemistry

CHEMISTRY AND BIOCHEMISTRY Courses

CHEM 515. Intermediate Organic Chemistry. 3 Credits.

Lecture 3 hours; 3 credits. An in-depth treatment of the chemistry of carbon compounds, including reaction mechanisms, spectral techniques, polymerization, pericyclic reactions, and biomolecules.

CHEM 521. Instrumental Analysis Lecture. 3 Credits.

Lecture 3 hours; 3 credits. Designed to be taken concurrently with CHEM 522. A study of the basic principles of spectroscopic, chromatographic, and electrochemical methods of quantitative chemical analysis. Methods of chemical instrumentation are also included.

CHEM 522. Instrumental Analysis Laboratory. 3 Credits.

Laboratory 6 hours; 3 credits. Pre- or co-requisite: CHEM 521 with a grade of C or better. An intensive laboratory study of the principles of analytical chemistry. Experiments in spectroscopic, chromatographic, and electrochemical methods are conducted to illustrate fundamental principles and to provide the opportunity to develop skills in the use of instrumentation for chemical measurement.

CHEM 541. Biochemistry Lecture. 3 Credits.

Lecture 3 hours; 3 credits. This course is a one-semester survey of the major molecular constituents, bioenergetics, enzymes, nucleic acid structure, and genetic information transfer pathways fundamental to biochemistry.

CHEM 542. Biochemistry Laboratory. 4 Credits.

Lecture 1 hour; laboratory 6 hours; 4 credits. Prerequisite or corequisite: CHEM 541 with a grade of C or better. Principles and techniques of biochemical and immunological procedures involving protein characterization and isolation, enzymology, bioinformatics, and common molecular biology techniques for nucleic acids will be presented. (This is a writing intensive course.)

CHEM 543. Intermediate Biochemistry. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: CHEM 541 with a grade of C or better or equivalent. This course presents an in-depth study of protein structure, folding, and synthesis. The major metabolic pathways will be studied in detail regarding thermodynamics and mechanism of regulation or control of individual enzymes and entire metabolic pathways. Concepts of metabolic disease will be introduced and effects on integrated metabolism will be presented.

CHEM 551. Advanced Inorganic Chemistry. 3 Credits.

Lecture 3 hours; 3 credits. Theoretical aspects of modern inorganic chemistry: bonding theories, stereochemistry, acid-base theories, coordination compounds, organometallic and bioinorganic compounds.

CHEM 552. Advanced Inorganic Chemistry Laboratory. 2 Credits.

Laboratory 4 hours; 2 credits. Prerequisite: CHEM 551 with a grade of C or better. Advanced topics in inorganic synthesis.

CHEM 553. Essentials of Toxicology. 3 Credits.

Lecture 3 hours; 3 credits. Fundamental principles of toxicology: dose-response relationship, toxicologic testing, chemical and biological factors influencing toxicity, organ toxicology, carcinogenesis, mutagenesis, teratogenesis.

CHEM 560. Frontiers in Nanoscience and Nanotechnology. 1 Credit.

Lecture 1 hour; 1 credit. Nanotechnology presents unparalleled opportunities for advances in technology and medicine. Simultaneously, nanotechnology presents new challenges to organisms and to our environment. These undefined risk factors threaten to slow the development of new technologies and novel medical therapies. This course will review: structure, synthesis and properties of key nanomaterials; key applications of nanomaterials in technology and medicine; and impacts of nanomaterials on plant and animal physiology and the environment more generally. This course will be team-taught by faculty members in Biological Sciences, Chemistry and Biochemistry, and Engineering.

CHEM 669. In-Service Practicum. 3-6 Credits.

6 credits; 50 hours per credit. Prerequisites: CHEM 631 632. One semester of work experience in local hospital, forensic, or industrial laboratory. Available for pass/fail grading only.

CHEM 670. Graduate Orientation. 3 Credits.

Lecture, 3 hours; 3 credits. An introduction to graduate studies in chemistry. Topics include responsible conduct of research (RCR), grant writing skills, oral presentation of chemical research and methods for searching the chemical literature. Attendance at departmental seminars is required. Limited to first-year chemistry doctoral students.

CHEM 685. Frontiers in Chemistry. 1-3 Credits.

1-3 credits each semester. Prerequisite: permission of the department chair. Topics representing the most recent advances in various fields of chemistry or ones which represent an interdisciplinary advancement.

CHEM 690. Seminar. 1 Credit.

1 credit. Master's students attend seminars given by researchers from across the country in order to expose them to additional areas of research in chemistry and biochemistry.

CHEM 691. Master's Seminar. 2 Credits.

2 credits. Master's students attend seminars; attend a class on giving seminars; and present a seminar on their own research.

CHEM 695. Topics in Chemistry. 1-3 Credits.

1-3 credits each semester. Prerequisite: permission of the department chair.

CHEM 698. Master's Research. 1-9 Credits.**CHEM 699. Master's Thesis. 3 Credits.**

Prerequisites: Departmental permission required.

CHEM 701. Advanced Analytical Chemistry. 3 Credits.

Lecture, 3 hours; 3 credits. The theoretical and practical foundation of analysis with emphasis on recent analytical developments and current literature; topics may include figures of merit and data treatment, sampling and extraction, HPLC, electrochemistry, circular dichroism, FT-IR, Raman, MS, electrophoresis and NMR. Lectures are given by experts in those techniques.

CHEM 702. Advanced Analytical Chemistry II. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisites: Instrumental Analysis (or its equivalent). This course will review the most cutting-edge Advances Analytical Chemistry Instrumentation and Methods, spanning over three core areas of analytical chemistry (Spectroscopy, Separation and Electrochemistry) and offer the in depth understanding of objectives, motivations, and future directions of Advanced Analytical Chemistry Instrumentation. The course will focus on advanced instrumentation and methodologies that can achieve ultra sensitive analysis and detection, including single molecular spectroscopy, nanoparticle probes, high-speed separation in microfluidic devices, ultramicroelectrodes for sensing and imaging.

CHEM 703. Chromatographic Separations by HPLC and GC. 3 Credits.

Lecture 3 hours; 3 credits. This course covers basic principles of chromatography emphasizing high performance liquid chromatography (HPLC) and gas chromatography (GC), as well as separation modes, instrumentation, detection methods, quantification, and sample preparation including solid phase extraction. Examples from environmental sciences, biosciences and industry will be stressed.

CHEM 704. HPLC and GC Laboratory. 2,3 Credits.

Laboratory 4 or 6 hours; 2 or 3 credits. Corequisite: CHEM 703. This lab course consists of six to seven independent HPLC and GC exercises based on examples from environmental, bioscience, and industrial applications.

CHEM 715. Automation and Management of the Clinical Chemistry Laboratory. 1 Credit.

Lecture 1 hour; 1 credit. Prerequisite: CHEM 631 or permission of the instructor. The basic principles of management of the clinical chemistry laboratory and regulatory issues in laboratory management are presented.

CHEM 716. Electrochemical Methods of Analysis. 1,2 Credit.

2 credits. This course presents the fundamental principals and practical applications of modern electrochemical methods of analysis. Lectures and text readings cover the basic concepts and fundamental principals of this division of analytical techniques. Detailed descriptions and demonstrations of modern electrochemical research instrumentation will be provided. Students will obtain hands-on experience with this instrumentation by performing a required chemical determination using an electroanalytical method, and by undertaking a special analytical project. Research applications of other electroanalytical techniques and instrumentation, in addition to those actually used by the students in this course, will be discussed and/or demonstrated.

CHEM 720. Experimental Design and Data Treatment. 3 Credits.

Lecture 3 hours; 3 credits. A hands-on approach to experimental design and multivariate data analysis. Modern computer-based chemometric theories will be presented.

CHEM 722. Bonding and Group Theory. 3 Credits.

3 credits. Introduction to group theory and application to problems in bonding and spectroscopy.

CHEM 723. Modern Synthetic Organic Chemistry. 3 Credits.

Design of complex organic molecules. Topics covered will include: retrosynthetic analysis, stereochemical control and contemporary methods. Prerequisite: CHEM 415 or CHEM 515 or a pass in the organic placement exam.

CHEM 724. Bioinorganic Chemistry. 3 Credits.

3 credits. This course is a survey of the mechanisms of biochemical activity of the trace elements. Topics include oxygen uptake, oxidation-reduction, metabolism, and toxicity.

CHEM 725. Physical Organic Chemistry. 3 Credits.

Lecture 3 hours; 3 credits. Approaches to the study of reaction mechanisms, including molecular orbital theory, thermochemistry, kinetics, isotope effects, solvent and substituent effects (including linear free energy relationships), acidity, acid catalysis, and detection of reactive intermediates.

CHEM 726. Medicinal Chemistry. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: CHEM 721 or permission of the instructor. Study of the chemistry and mode of action of various medicinal and physiologically active compounds.

CHEM 734. Organic Spectroscopy. 3 Credits.

3 credits. Organic functional group and structure analysis with ultraviolet, infrared, nuclear magnetic resonance, mass, and other spectroscopic techniques.

CHEM 736. Introduction to Organic Synthesis. 3 Credits.

3 credits. Detailed coverage of fundamental organic transformations with emphasis on reduction, oxidation, carbon-carbon bond formation, and protecting group strategy.

CHEM 741. Stable Isotope Chemistry. 3 Credits.

Lecture 3 hours; 3 credits. This course investigates the stable isotope systematics of carbon, nitrogen, hydrogen, oxygen and sulfur in biological, chemical and geological systems. Course material includes analytical methods, fractionations and applications of stable isotope analyses in a wide range of natural systems. Recommended to graduate students in chemistry, earth sciences and biological sciences with an interest in environmental processes.

CHEM 742. Advanced Mass Spectroscopy. 3 Credits.

3 credits. Prerequisites: CHEM 423/523. This course trains students in the theory and application of advanced mass spectrometric methods as used in all subdisciplines of chemistry and biochemistry.

CHEM 743. Organic Geochemistry. 3 Credits.

Lecture 3 hours; 3 credits. Organic geochemistry is the study of organic compounds originally produced by photosynthesis and altered as they cycle through the soils, atmosphere, rivers, oceans, and crustal rocks. This course will include the carbon/oxygen cycles, biomarkers, organic matter diagenesis/catagenesis, analytical techniques used in organic geochemistry, and an introduction to carbon isotopes.

CHEM 744. NMR Spectroscopy. 3 Credits.

3 credits. This course presents the basics of NMR spectroscopy. Topics include basic NMR theory, NMR instrumentation, one- and two-dimensional ¹H and ¹³C techniques, and introduction to solid-state NMR.

CHEM 748. Environmental Chemistry Laboratory. 3 Credits.

Laboratory 6 hours; 3 credits. Study of the basic principles and methods of trace chemical analysis of environmental systems, including spectroscopic, chromatographic, and electrochemical instrumental methods, in addition to wet chemical methods.

CHEM 749. Environmental Chemistry. 3 Credits.

Lecture 3 hours; 3 credits. An overview of the natural chemistry systems operating in the atmosphere, in the terrestrial environment (both water and soils), and in the oceans, and the potential effects that human activities may have on them. Specific topics include the origin and evolution of the earth and life, the chemistry of the atmosphere (including the ozone layer and greenhouse effect), the organic and inorganic components of soil and water, chemical weathering of rocks, metal complexation, biological processes in soil and water, and global-scale chemical processes.

CHEM 754. Quantum Chemistry. 3 Credits.

Lecture, 3 hours; 3 credits. Overview of the development and application of quantum mechanics from a chemical perspective.

CHEM 755. Computational Chemistry. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: CHEM 754 or permission of the instructor. Comprehensive overview of ab initio (quantum) calculations and molecular dynamic simulations, the two most widely used computational methods. Plus a brief overview of other computational applications in chemistry and biology.

CHEM 756. Inorganic Reaction Mechanisms. 3 Credits.

3 credits. This course is a survey of the major mechanisms of inorganic and organometallic chemistry. Topics include kinetics, ligand substitution, electron transfer, and photochemistry.

CHEM 757. Organic Chemistry Mechanisms. 3 Credits.

3 credits. Prerequisites: CHEM 725/825. The application of physical organic techniques to study the mechanisms of key organic reactions and the structures of reaction intermediates. Includes photochemistry and pericyclic reactions.

CHEM 760. Molecular Spectroscopy. 3 Credits.

An introductory survey of the rotational, vibrational and electronic spectroscopy of molecules from the perspective of quantum mechanics and group theory. Prerequisite: CHEM 333.

CHEM 762. Advanced Techniques in Biochemistry. 1-3 Credits.

Laboratory 2-6 hours; 1-3 credits. A laboratory course in modern experimental methodology and instrumentation in biochemistry.

CHEM 765. Advanced Biochemistry. 3 Credits.

Lecture and discussion 3 hours; 3 credits. Topics will include: macromolecular structure, function, thermodynamic stability and folding kinetics; protein chemistry; molecular biology; molecular mechanisms of disease and bioinformatics.

CHEM 767. Enzymology. 3 Credits.

Lecture 3 hours; 3 credits. Consideration of experimental methods for examining the kinetic data and rate equations from enzymes, examination of various models of enzyme catalysis, comprehensive presentation of the mechanisms of coenzyme action, and studies of mechanism of enzyme action.

CHEM 769. Nucleic Acids Biochemistry. 3 Credits.

Lecture 3 hours; 3 credits. A comprehensive presentation of the chemistry of RNA and DNA. Modern concepts of gene regulation, the control over transcription, RNA processing and translation, cell cycle control and molecular carcinogenesis.

CHEM 775. Physical Biochemistry. 3 Credits.

Lecture 3 hours; 3 credits. Physical characterization of macromolecules, polarized light, absorption and fluorescence, sedimentation and transport hydrodynamics, electrophoretic mobility, light scattering, and structural x-ray crystallography of proteins and nucleic acids.

CHEM 779. Kinetics and Thermodynamics. 3 Credits.

Lecture 3 hours; 3 credits. A survey of modern theories of reaction rates and mechanisms, classic thermodynamic functions, and an introduction to statistical thermodynamics.

CHEM 795. Selected Topics in Chemistry and Biochemistry. 3 Credits.

Lecture and discussion 3 hours; 3 credits. Prerequisite: permission of the instructor. Thorough coverage of areas selected to meet special needs and interests.

CHEM 814. Biomedical Sciences Laboratory. 2 Credits.

2 credits each semester. With approval of the program director.

CHEM 815. Biomedical Sciences Laboratory. 2 Credits.

2 credits each semester. With approval of the program director.

CHEM 816. Electrochemical Methods of Analysis. 1,2 Credit.

2 credits. This course presents the fundamental principals and practical applications of modern electrochemical methods of analysis. Lectures and text readings cover the basic concepts and fundamental principals of this division of analytical techniques. Detailed descriptions and demonstrations of modern electrochemical research instrumentation will be provided. Students will obtain hands-on experience with this instrumentation by performing a required chemical determination using an electroanalytical method, and by undertaking a special analytical project. Research applications of other electroanalytical techniques and instrumentation, in addition to those actually used by the students in this course, will be discussed and/or demonstrated.

CHEM 822. Bonding and Group Theory. 3 Credits.

3 credits. Introduction to group theory and application to problems in bonding and spectroscopy.

CHEM 824. Bioinorganic Chemistry. 3 Credits.

3 credits. This course is a survey of the mechanisms of biochemical activity of the trace elements. Topics include oxygen uptake, oxidation-reduction, metabolism, and toxicity.

CHEM 834. Organic Spectroscopy. 3 Credits.

3 credits. Organic functional group and structure analysis with ultraviolet, infrared, nuclear magnetic resonance, mass, and other spectroscopic techniques.

CHEM 836. Introduction to Organic Synthesis. 3 Credits.

3 credits. Detailed coverage of fundamental organic transformations with emphasis on reduction, oxidation, carbon-carbon bond formation, and protecting group strategy.

CHEM 842. Advanced Mass Spectroscopy. 3 Credits.

3 credits. This course trains students in the theory and application of advanced mass spectrometric methods as used in all subdisciplines of chemistry and biochemistry.

CHEM 844. NMR Spectroscopy. 3 Credits.

3 credits. This course presents the basics of NMR spectroscopy. Topics include basic NMR theory, NMR instrumentation, one- and two-dimensional ¹H and ¹³C techniques, and introduction to solid-state NMR.

CHEM 856. Inorganic Reaction Mechanisms. 3 Credits.

3 credits. This course is a survey of the major mechanisms of inorganic and organometallic chemistry. Topics include kinetics, ligand substitution, electron transfer, and photochemistry.

CHEM 857. Organic Chemistry Mechanisms. 3 Credits.

3 credits. Prerequisites: CHEM 725/825. The application of physical organic techniques to study the mechanisms of key organic reactions and the structures of reaction intermediates. Includes photochemistry and pericyclic reactions.

CHEM 862. Advanced Techniques in Biochemistry. 1-3 Credits.

Laboratory 2-6 hours; 1-3 credits. A laboratory course in modern experimental methodology and instrumentation in biochemistry.

CHEM 890. Chemistry Seminar. 1 Credit.

1 credit. Students attend seminars given by researchers from across the country on order to expose them to additional areas of research in chemistry and biochemistry.

CHEM 891. Doctoral Seminar. 2 Credits.

2 credits. Students attend seminars; attend a class on giving seminars; and present a seminar on their own research.

CHEM 895. Intern in Clinical Laboratory Management. 1-3 Credits.

Lecture 1-3 hours; 1-3 credits each semester. Lecture and discussion of recent advances in the field of biomedical sciences.

CHEM 898. Doctoral Research. 1-9 Credits.**CHEM 899. Dissertation. 1-9 Credits.****CHEM 999. Chemistry 999. 1 Credit.**

1 credit. A one-hour pass/fail registration required of all graduate students to maintain active status during the final semester prior to graduation. After successfully passing the candidacy examination, all doctoral students are required to be registered for at least one graduate credit each term until the degree is complete.

CHP - Community Health Professions

COMMUNITY HEALTH PROFESSIONS Courses

CHP 500. Ethics in Health Administration. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: permission of the instructor. A survey of philosophical problems common to health sciences, including an analysis of the nature of health in its historical and contemporary contexts.

CHP 515. Critical Issues in Public/Community Health Administration. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: Permission of the instructor. Identification and analyses of critical issues currently facing public/community health and the American health care system. (This is a writing intensive course.).

CHP 520. Foundations of Gerontology. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: permission of instructor. Focuses on changes in the characteristics, status, and roles of the elderly; personality development, mental health, and adjustment of individuals with emphasis on biophysical and psychosocial processes as they influence capacity and performance in the elderly.

CHP 525. Health Aspects of Aging. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: CHP 520 or permission of the instructor. Identifies major issues and problems in meeting health care needs of the aged. Emphasis on role of social assets and supports in determining effects of life changes on the aging process.

CHP 526. Skills in Health Services Administration I. 1-3 Credits.

Lecture 2 hours; 1 hour web; 1-3 credits. Prerequisite: permission of instructor. Introduction of basic concepts which will allow for development of critical skills in a variety of managerial areas pertinent to the delivery of health care.

CHP 527. Skills in Health Services Administration II. 1-3 Credits.

Lecture 2 hours; 1 hour web; 1-3 credits. Prerequisite: permission of instructor. Continuation of basic concepts and development of critical management skills pertinent to the delivery of health care. Experts in various fields will provide students with useful strategies in the administration of health care services.

CHP 530. Community Health Resources and Health Promotion. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: permission of instructor. Designed to provide information about community health resources.

CHP 540. Finance and Budgeting in Healthcare. 3 Credits.

3 hours lecture. This course covers financial management functions in healthcare organizations including operating and capital budgeting processes along with budgeting and financial controls.

CHP 545. Health Services Research. 3 Credits.

This course focuses on health services research and its assessment abilities and application in health care. Topics include the use of EXCEL, SAS, and SPSS to analyze data. An exploration of the issues and challenges of health services research for health related organizations and other organizations. Statistical procedures and practices will also be conducted. Prerequisite: STAT 130M.

CHP 550. Public and Community Health Administration. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: permission of instructor. A review of the principles and practice of administering public and community health organizations and programs at federal, state, and local levels. Constitutional, statutory and administrative bases for organizing and conducting public/community health programs will be discussed.

CHP 555. Interpersonal and Counseling Skills for Health Professionals. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: permission of instructor. Study and practice in human relations for health practitioners. The course is designed to incorporate the latest and best techniques from the health sciences with a "therapeutic use of self."

CHP 556. Substance Use and Abuse. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: permission of instructor. Focuses on facts about drugs and drug abuse, on value judgments concerning drugs, and on interaction of facts and value judgments. Emphasis is on drug abuse prevention.

CHP 561. Managerial Epidemiology. 3 Credits.

This course will blend theory and application of epidemiology. This course will also provide a comprehensive introduction to epidemiology and explain how to use epidemiological concepts and tools to improve decisions about the management of health services. Prerequisite: CHP 200.

CHP 565. Policy and Politics of Health. 3 Credits.

Lecture 3 hours; 3 credits. This course will explore both health policy and the politics of health. Students will develop an understanding of the systematic and analytical framework for developing health and health care policy issues.

CHP 570. Death, Dying and Survivorship. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: permission of instructor. Utilizes readings from sociology, psychology, literature, art, law, religion, and the medical and nursing sciences to explore death in its personal, cultural and professional significance. Audiovisual presentations and guest speakers will provoke thought and discussion to allow students to come to terms with their attitudes toward death and assist others in dealing with this important life experience.

CHP 575. Healthcare Marketing. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: permission of the instructor. This course provides a basic understanding of marketing in a health care setting. This course will cover the following: the history of marketing in a health care setting, health care markets, marketing techniques, and leadership skills in managing and supporting the marketing efforts.

CHP 580. Health Ethics and the Law. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: permission of instructor. This course provides the students with a basic knowledge of health law and examines legal issues confronting health services administrators in various health care environments.

CHP 585. Health Informatics. 3 Credits.

Lecture 3 hours; 3 credits. This course focuses on healthcare informatics (information systems) and application in health care organizations. It provides an overview of health information system concepts, management, and integration of technology in healthcare organizations.

CHP 595. Topics in Public/Community Health Administration. 1-3 Credits.

1-3 credits. Prerequisite: permission of the instructor. This course provides the opportunity for the study of selected topics in public/community health, including informatics, under the supervision of a faculty member.

CHP 596. Topics in Public/Community Health Administration. 1-3 Credits.

1-3 credits. Prerequisite: permission of the instructor. This course provides the opportunity for the study of selected topics in public/community health, including informatics, under the supervision of a faculty member.

CHP 597. Readings in Public/Community Health Administration. 1-3 Credits.

1-3 credits. Prerequisite: permission of the instructor. This course provides the opportunity for advanced investigations of selected issues/concerns in public/community health administration, under the supervision of a faculty member. It must be taken by students who wish to pursue topics not covered by regularly scheduled courses.

CHP 600. Principles of Community Health. 3 Credits.

The course will provide an introduction to the relationship between health status, the current multifaceted delivery system and the social and political aspects of the community. Topics of this course include community health education, sanitation, mental health, maternal and child health, and others.

CHP 601. Research Design and Evaluation in the Health Professions. 3 Credits.

This course is designed for graduate students in the health professions to explore the concepts, problems, needs, and issues in both conducting research and evaluation and in analysis of research related to the health professions. An understanding of statistics is strongly advised.

CHP 602. Principles of Environmental Health Science and Protection. 3 Credits.

An introduction to the chemical, physical and biological factors affecting human health and well being. The emphasis is on the application of controls to prevent disease and maximize environmental quality. (Cross-listed with ENVH 600).

CHP 611. Social and Cultural Aspects of Public Health and Illness. 3 Credits.

Scholars will gain an understanding of social and cultural issues associated with public health and illness through discussion, application of principles and theories and an interactive case study. Scholars will identify personal and social influences on public health and discuss health disparities and community health needs. Special attention will be paid to populations bound by shared risks and behaviors.

CHP 630. Health Care Marketing. 3 Credits.

This course is devoted to exploring the fundamentals of marketing as they relate to the health care environment. Emphasis will be placed on marketing of new programs, including health-promotion programs. It provides a survey of marketing activities as they relate to the health care environment.

CHP 633. Financing Health Care. 3 Credits.

Students will examine financial evaluation of the health care industry, the source of funds, and the effects of changing patient policies. Other topics of interest will be financial strategies, budgets, and capital outlay. (cross-listed with MPH 733).

CHP 635. Managed Care. 3 Credits.

This course provides the student all the basic information needed to learn critical concepts of managed care. It explores topics ranging from the roots of managed care to types of managed care organizations, negotiating and contracting for services, controlling utilization and using data reports in the management of managed care organizations. In addition, the course addresses the future of managed care in the turbulent, dynamic health care environment.

CHP 637. Issues In Health Care Administration. 3 Credits.

This course explores current issues/trends faced by health care/institutions in the constantly evolving health care environment. Topics such as the impact of shift in service delivery from inpatient to outpatient care, development of multihospital systems and hospital alliances, prospective payment systems, retrospective payment systems and many other critical issues will be addressed.

CHP 640. Statistical Reasoning for the Health Professions. 3 Credits.

This course introduces the application of quantitative reasoning through the use of fundamental concepts in statistics and quantitative analyses in health care. Main topics include univariate, bivariate and multivariate procedures appropriate with parametric and non-parametric data. Related topics include: sampling distribution, statistical inference, and hypothesis testing.

CHP 646. Epidemiology. 3 Credits.

This course examines epidemiology as a method for viewing inborn community health problems and as a body of knowledge derived from this method. Skills in using epidemiology as a method and as knowledge to solve community health problems will be included.

CHP 651. Public and Community Health Administration. 3 Credits.

A review of the principles and practice of administering public and community health organizations and programs at federal, state and local levels. Constitutional, statutory and administrative bases for organizing and conducting public and community health programs will be discussed.

CHP 669. Practicum. 1-6 Credits.

Field experience. The student is provided an opportunity to apply academic philosophy, theory, and principle during a period of supervised practice.

CHP 690. MSCH Comprehensive Exam. 0 Credits.

The Master of Science in Community Health Comprehensive Examination offers the student an opportunity to synthesize the learning experience of the graduate program and demonstrate mastery of program outcomes. The student must receive a grade of pass on the comprehensive exam to successfully complete the MSCH degree.

CHP 695. Topics in Community Health. 1-3 Credits.

This course provides the opportunity for the study of selected topics in community health, under the supervision of a faculty member. Prerequisites: permission of the instructor.

CHP 697. Readings in Community Health. 1-3 Credits.

This course provides an opportunity for advanced investigations of selected issues/concerns/trends in community health, under the supervision of a faculty member. It may be taken by students who wish to pursue topics not covered by regularly scheduled courses Prerequisites: permission of the instructor.

CHP 698. Thesis Research. 1-6 Credits.

Devoted to research, writing of the thesis and scheduled conferences with the candidate's advisor and thesis committee. Student must submit an acceptable written thesis demonstrating knowledge of problem selection, data classification, analysis and interpretation and defend it.

CHP 699. Thesis Research. 1-6 Credits.

Devoted to research, writing of the thesis.

CHP 711. Health Care Research. 3 Credits.

This course is a conceptual approach to selection and application of univariate, bivariate and multivariate statistical techniques in health research data analysis. Emphasis is placed on handling large data sets and the use of a computer for manipulation of quantitative data.

CHP 715. Decision Analysis in Health Care. 3 Credits.

This course is a conceptual approach and teaches students the art and science of decision making. It covers expected utility theory, decision tree analysis, cost benefit analysis, and the psychological aspects of the decision-making process in the context of health policy research. (cross listed with HLSC 815).

CHP 720. Health Care Delivery Systems. 3 Credits.

This course provides the student with an opportunity to analyze the American health-care system. Like any other system in our society, the health care system is composed of complex organizational dynamics and structures which predicate the interaction between the major components of the system: personnel who provide service; institutions in which care is provided; financing mechanisms that pay for care; and the government which attempts to regulate it. This course is designed for in-depth analysis and synthesis of all aspects of health care delivery with an emphasis on improving the delivery and access to care.

CHP 750. Educational Processes for the Health Professional. 3 Credits.

The teaching/learning process is the focus of this course for application to the many teaching roles which the health professional faces. The course is designed to meet the needs of the health professional in the areas of patient instruction, educational programs, and continuing education. The course is designed to assist students in identifying and gaining proficiency in the application of a variety of skills utilized by the health professional in designing, organizing, coordinating and evaluating health-education programs.

CHP 764. Health Economics. 3 Credits.

This course introduces economic analysis in health, health care, and health policy. It aims to provide the background of using economic approaches to understand the behaviors of consumers, producers, and insurers in the health care market. Main topics include economic determinants of health, supply and demand for medical care and insurance.

CHP 772. Policy and Politics of Health. 3 Credits.

The course enables the student to develop a systematic and analytical framework for understanding health care policy issues. The policy process is covered in detail. Timely policy issues are also discussed.

CHP 773. Developing Grants and Contracts in Health Professions. 3 Credits.

Designed as a "hands-on" approach in effective grantsmanship, this course will guide the student from the identification of potential funding sources through proposal development. Highlights include program planning, nonprofit status, governmental/foundation corporate trends, local resources and grants administration.

CHP 775. Comprehensive Health Planning. 3 Credits.**CHP 787. Legal Aspects of Health Services. 3 Credits.**

This course covers legal aspects related to health services, including regulatory processes and implementation, and policy choices.

CHP 795. Topics. 1-3 Credits.

Designed to provide the student with an opportunity to study independently or in small groups and investigate specific topics of current interest in the health services.

CHP 999. Community Health Professions 999. 1 Credit.

A one-hour pass/fail registration required of graduate students to maintain active status during the final semester prior to graduation.

COMM - Communications

COMMUNICATIONS Courses

COMM 500. Intercultural Communication. 3 Credits.

This course is designed to introduce students to the study of communication in cultural contexts, the purpose of which is to prepare students to live and work within an increasingly multicultural world. This is accomplished by first defining and critically analyzing concepts of culture. Throughout the semester, the course will investigate theories of culture and communication that address the development of cultural identity, intercultural communication competence, the role of verbal and nonverbal communication across cultures, the cultural composition of the U.S., and finally ethical communication and challenges in a globalized era. (This is a writing intensive course.)

COMM 501. Communication Theory. 3 Credits.

An overview of general and contextual theories of communication. Focus is on the nature of communication theory, the role of theory in communication inquiry, and the relationships among theory, research, and practice.

COMM 503. Public Relations and Crisis Communications. 3 Credits.

This course introduces students to the basic elements of public relations as it pertains to assisting organizations avoid, mitigate and recover from crisis situations. Students will have the opportunity to both observe and participate in crisis communications situations.

COMM 505. Communication and Culture in the Middle East. 3 Credits.

The course examines the tensions between modernity and tradition in the context of Middle East culture. Cultural variables for study include myth and religion, family structures and the use of science and technology.

COMM 507. Communication and Culture in Asia. 3 Credits.

This course provides theoretical models for examining the values, communication patterns and cultural perspectives of the peoples of Asia. Films, folklore, newspapers and literature from Asia are investigated.

COMM 512. Interpersonal Communication Theory and Research. 3 Credits.

A survey of classic and contemporary theories and research of communication in personal and social relationships across the lifespan. Emphasizes communication as a means to facilitate conditions for development of positive relational outcomes. (This is a writing intensive course.)

COMM 521. Communication and Conflict Management. 3 Credits.

Focus on theory and research of communication processes in conflict episodes across social and personal relational contexts. Applications of communication approaches to conflict management are emphasized.

COMM 525. Family Communication Theory and Research. 3 Credits.

A survey of classic and contemporary theories and research of communication in family units, family relationships, and family interfacing with society. The course emphasizes communication in the social construction of evolving "family" realities as well as communication as means to facilitate conditions for development of positive domestic outcomes.

COMM 527. Children's Communication Theory and Research. 3 Credits.

A survey of theories and research of communication during childhood. Emphasis is on children as developing communicators, their relationships, and their interactions with media. Factors affecting optimal development of children's communication and development of applications to enhance children's communication development are emphasized.

COMM 534. African-American Rhetoric Voices of Liberation. 3 Credits.

With the goals of examining the rhetorical strategies and their historical context, students will study and critique original speeches and various forms of discourse by African-American speakers.

COMM 543. Hispanic Film. 3 Credits.

A topical study of the major works of Spanish and Latin American film from Buneul to the present. The course explores many issues, including those related to gender, race, symbolism, and class struggle. Prerequisites: COMM 270A or THEA 270A or permission of instructor.

COMM 544. German Cinema. 3 Credits.

This course focuses on the German cinema from perspectives such as fascism and its legacy, film as historical critique, and Weimar cinema.

COMM 545. Communication Analysis and Criticism. 3 Credits.

A survey of the key methods used in critiquing various forms of human and mediated communication for the purpose of becoming more discerning consumers of public and mass mediated messages. Analysis will include films, television, and radio programs, advertisements, newspapers, public discourses, speeches, and conversations.

COMM 547. Electronic Media Law and Policy. 3 Credits.

This course focuses on legal and policy issues related to modern media systems and technologies, with an emphasis on legal considerations of electronic media. Subjects include First Amendment issues concerning news, programming, and advertising; station licensing; and challenges to traditional legal thought brought about by new technologies.

COMM 548. Transnational Media Systems. 3 Credits.

An examination of the rise of broadcast technology and world flow of information and entertainment. Theory and policy issues of systems of broadcast ownership, access, regulation, programming, transborder, broadcasting and cultural imperialism and dominance of Western programming will be addressed.

COMM 555. Critical Analysis of Journalism. 3 Credits.

A critical examination of the news industry as practiced in the printed press, network and cable television, magazines, the Internet, and alternative press. Class examines the political economy of journalism, the sociology of journalistic practice, international news flows, ideological/political control of news, and mythological narrative forms within news.

COMM 556. Organizations and Social Influence. 3 Credits.

Focuses on theories, research and applications of the social influence function of communication in a variety of organizational contexts. Examines traditional and nontraditional social influence theories and research as applied to organizational change.

COMM 565. Mass Media and the National Elections. 3 Credits.

Focuses on use of media in presidential elections from 1952 to the present. Topics include image creation and management, and the relationship between media and voting behavior.

COMM 567. Media, Politics and Civic Engagement. 3 Credits.

Focuses on the ways in which citizens develop knowledge of, engage with, and practice politics through mass media and personal media forms. Students examine historical and contemporary practices of civic engagement and political organizing via media such as the alternative press, talk radio, rebel radio, letters-to-the-editor, the Internet, cinematic representations, public access television, and others. Students seek to understand the power available to citizens for political engagement via mediated communication forms.

COMM 568. Communication and Political Symbolism. 3 Credits.

The persistent communication and display of symbols and rituals of political meaning are central to how political power is built and legitimately exercised. This course examines such symbols and rituals by focusing on public rituals such as elections, the State of the Union address, and wars; political symbols such as the American and Confederate flag, Statue of Liberty, and television news; and institutions and practices related to public memory, such as war memorials, historical reenactments, museum and theme park displays, and film narratives.

COMM 571. International Film History. 3 Credits.

An examination of world cinema as a technology, a business, an institution, and an art form from inception to the present. Emphasis is on the narrative fiction film, its technological and aesthetic development, economic organization, and socio-cultural context. Representative classic and contemporary works will be screened and analyzed.

COMM 572. New Media Topics: Theories and Practices. 3 Credits.

This seminar investigates one or two particular emergent new media practices and theories. The topics will be chosen at the discretion of the instructor but may include issues such as "mobile media," "micro media and audiences," and "social media."

COMM 573. Television and Society. 3 Credits.

The role of television in the cultural, psychological, and economic life of America. The structure and design of television programs; and the history and function of television in reinforcing or altering public perceptions of ideas, events, and people. Major critical approaches are employed in examining television's social impact and global reach.

COMM 578. Principles of Media Marketing and Promotion. 3 Credits.

Course introduces students to the ways in which different media forms are used for advertising and marketing purposes. Emphasis is on electronic media, though other approaches, such as direct marketing techniques and the increasing use of new media technologies for marketing, are also examined.

COMM 579. American Film History. 3 Credits.

An examination of American motion pictures as an art form, a business and an institution from inception to the present. Primary attention is accorded to the narrative fiction film, its technological and aesthetic development, economic organization and social impact. This course highlights the many connections between film history and American culture.

COMM 580. The Video Documentary II. 3 Credits.

Discussion/presentation topics range from production field work to post-production editing. The final third of the semester will be devoted to compiling the rough footage in post production.

COMM 581. The Documentary Tradition. 3 Credits.

An in-depth investigation of the history and theory of the documentary tradition in film, television, and radio. Examining both American and international examples, the course looks at major schools, movements, goals, and styles of documentary production. Representative texts will be studied for their socio-political influences, persuasive techniques, and aesthetic formulas.

COMM 585. Film and Television Genres. 3 Credits.

This course is designed to examine the conventions and meanings of various film and television genres within their broader aesthetic, socio-historical, cultural, and political contexts. Each time the class is offered it will focus in depth on a different genre, such as the gangster, the Western, the musical, the comedy, science fiction, among others.

COMM 586. Advanced Filmmaking. 3 Credits.

Offers the advanced film/video maker an opportunity to produce a project beyond the scope of previous classroom projects. Students come to the course in production teams (typically 5 members), with each member assigned a specific duty (cinematography, editing, directing, etc.). Students are permitted into the course solely by instructor approval and only after demonstration of superior skills in subordinate courses and acceptance of a submitted screenplay. Prerequisites: Permission of the instructor.

COMM 595. Topics in Communication. 1-3 Credits.

The advanced study of selected topics designed to permit small groups of qualified students to work on subjects of mutual interest which, due to their specialized nature, may not be offered regularly. These courses will appear in the course schedule, and will be more fully described in information distributed to all academic advisors.

COMM 596. Topics in Communication. 1-3 Credits.

The advanced study of selected topics designed to permit small groups of qualified students to work on subjects of mutual interest which, due to their specialized nature, may not be offered regularly. These courses will appear in the course schedule, and will be more fully described in information distributed to all academic advisors.

COMM 597. Tutorial Work in Special Topics in Communication. 3 Credits.

Independent reading and study on a topic to be selected under the direction of an instructor. Conferences and papers as appropriate.

COMM 598. Tutorial Work in Special Topics in Communication. 3 Credits.

Topic to be selected under the direction of an instructor. Conferences and papers as appropriate.

COMM 600. Intercultural Communication: History, Theory and Application. 3 Credits.

Students begin with an overview and then cover (1) past intercultural communication research, (2) the philosophical underpinning and ethics behind intercultural communication research, and (3) current developments in intercultural communication theory. They then address the application of intercultural communication theory in specific intercultural communication contexts (e.g. business, education, health and international travel).

COMM 601. Lifespan Communication Research and Theory. 3 Credits.

This course takes a developmental approach to the study of communication by exploring the culminating effects of communication as it evolves across our lifetime. It encompasses all phases of life (birth-death) across interactions within family, work, social, health, and spiritual contexts. The focus is on foundational and contemporary lifespan theories and research.

COMM 602. Digital Communication Theory and Research. 3 Credits.

This class looks at emerging theories of new media and their transformative effects on industrial practices, news dissemination, cultural production, social interaction, and political engagement across the lifespan. Students engage in ongoing theoretical debates and participate in various online endeavors that offer real world research opportunities.

COMM 603. Social Change and Communication Systems. 3 Credits.

Examines the role of various communication systems in enacting social change involving commercial, governmental and not-for-profit contexts. Topics include persuasive techniques, community engagement, mobilizing large-scale social movements, and the political consequences of human and digital communication across the lifespan.

COMM 604. Lifespan Communication Research Methods. 3 Credits.

Prerequisites: COMM 601. An overview of social scientific and qualitative methods used in lifespan development communication research. Includes survey, experiment, observations, content and conversation analyses with an emphasis on developmental methods. Approaches to studying communication of children, adolescents, and later life are included.

COMM 605. Critical Methods and Digital Communication. 3 Credits.

Prerequisites: COMM 602. This class surveys the major methodological approaches available to critical communication researchers, such as semiology, structuralism, post-structuralism, neo-Marxism, and psychoanalysis, among others, within a cultural studies tradition. Special attention is paid to various digital communication technologies and how they are utilized throughout the lifespan.

COMM 607. Framing Theory. 3 Credits.

This course will investigate extant scholarship in framing theory and examine some real world applications of framing theory through case studies of how journalists cover news and the ways that "brand managers" position products and institutions.

COMM 615. Construction of the Gendered Body. 3 Credits.

This course will examine: (1) the nature-nurture controversy as reflected in current theories about gender as a significant factor in the transformation of physical bodies into social bodies, (2) cultural objects and institutions that shape our gender roles and expectations, and (3) nonverbal language and power and the status of the sexes.

COMM 623. Relational Communication Across the Lifespan. 3 Credits.

Prerequisites: Permission of the instructor. This course explores theories and research of communication in everyday relationships across the lifespan from early childhood relationships until relationships at the end of life. Communication in personal and social relationships, within age cohorts (early childhood, adolescence, adulthood) are highlighted.

COMM 624. Positive Communication Across the Lifespan. 3 Credits.

Prerequisites: Permission of the instructor. This course examines communication theories and research in light of the theories and research of positive psychology. Topics include: strengths-based communication theorizing, communication and happiness, positive communication functions, creative communication, and positive communication outcomes (health, wellness, peace, hope).

COMM 628. Mediated Human Communication in the Digital Age. 3 Credits.

This course conceptualizes the relationship established by the processes of human communication that are mediated by new media technologies. The course examines how such technologies affect social relationships, and how cultural values influence usage patterns of these technologies.

COMM 630. The Information Society. 3 Credits.

This course explores the theories, questions, claims and myths that have accompanied the rise of new communication technologies and electronically derived digital information that define the 'Electronic Revolution,' also known as the Information Society.

COMM 640. Television and Politics. 3 Credits.

This class closely examines television's role in shaping and reflecting contemporary American political culture, the conduct of foreign policy, and formal political processes, such as elections.

COMM 650. Religious Communication. 3 Credits.

The seminar surveys the relationship between communication and religion with an emphasis on theory, research and applications. Topics may include the communication of religious beliefs/values via story, ritual, ceremony, worship, prayer and mediated communications.

COMM 668. Internship. 3 Credits.

Prerequisites: COMM 601 or COMM 602. A structured work experience providing both a conceptual understanding and on-the-job training in some aspect of lifespan and digital communication. A journal, a final paper, a log of hours, a portfolio of work, and a satisfactory evaluation by work supervisor and cooperating faculty member are required.

COMM 672. New Communications Media and Social Development. 3 Credits.

Course explores the interaction between media technology deployment and social development in nations and sub-national groups. Special emphasis is placed on the paradigm of "networks" in both societies and technologies.

COMM 673. Television Histories as Collective Memory. 3 Credits.

This seminar explores the parameters and implications of "television as historian," examines the general nature of this widespread phenomenon, and analyzes mass mediated versions of the past and how and why they were constructed.

COMM 675. Television in the Digital Era. 3 Credits.

This course examines the reinvention of television during the Digital Era (approximately 1995-Present). It identifies and analyzes the transformation of TV as a convergent technology, a viable art form, a global industry, a social catalyst, and a complex and dynamic reflection of the many audiences across the lifespan it reaches around the world.

COMM 678. Race and Television. 3 Credits.

This course examines the relationships among race, racial identity, and television. Multiple scholarly traditions are used to examine the interactions among television texts, audiences and institution, and historical and contemporary race relations.

COMM 685. Lifespan and Digital Communication Capstone Course. 3 Credits.

This is the capstone seminar for non-thesis students in their final semester to synthesize the relationships between lifespan and digital communication. Students will develop and complete a research paper or a digital communication project. Prerequisites: COMM 601, COMM 602, COMM 603, COMM 604, and COMM 605; permission of graduate program director.

COMM 689. Thesis Preparation. 3 Credits.

Prerequisites: COMM 601, COMM 602, COMM 603, COMM 604, and COMM 605. This course is intended for students in the Master of Arts in Lifespan and Digital Communication program who choose the thesis option. Course topics include: developing a thesis proposal, thesis rules and regulations, the thesis committee, presenting and defending a thesis proposal, and acquiring the essential tools needed to write and successfully defend an MA thesis.

COMM 695. Topics in Communication. 3 Credits.

The study of selected topics designed to permit qualified students to work on subjects of mutual interest in a seminar format which, due to their specialized nature, may not be offered regularly.

COMM 697. Tutorial in Special Topics in Communication. 3 Credits.

Independent reading and study of a topic under the direction of an instructor. Conferences and papers as appropriate. Prerequisites: Permission of the department chair.

COMM 698. Thesis Research. 3 Credits.

This course is intended for students in the Master of Arts in Lifespan and Digital Communication program who choose the thesis option. During the time a student is working on the MA thesis they must be enrolled in COMM 698, followed by COMM 699. Pre- or corequisite: COMM 689.

COMM 699. Thesis. 3 Credits.

This course is intended for students in the Master of Arts in Lifespan and Digital Communication program who choose the thesis option. During the time a student is working on the MA thesis they must be enrolled in COMM 698 followed by COMM 699.

COMM 795. Selected Topics in Communication Studies. 1-3 Credits.

The advanced study of selected topics in communication studies will be covered in such a way as to permit small groups of qualified students to study subjects of mutual interest which, due to their specialized nature, may not be offered regularly. Prerequisites: Permission of the instructor.

COMM 797. Independent Research in Communication Studies. 1-3 Credits.

Independent research directed by professors/faculty members examining communication topics. Prerequisites: Permission of the instructor.

COMM 895. Selected Topics in Communication Studies. 1-3 Credits.

The advanced study of selected topics in communication studies are covered in such a way as to permit small groups of qualified students to study subjects of mutual interest which, due to their specialized nature, may not be offered regularly. Prerequisites: Permission of the instructor.

COMM 897. Independent Research in Communication Studies. 1-3 Credits.

Independent research directed by professors/faculty members examining communication topics. Prerequisites: Permission of the instructor.

COMM 998. COMM 998. 1 Credit.

COUN - Counseling

COUNSELING Courses

COUN 595. Topics. 1-6 Credits.**COUN 601. Principles of Professional Counseling and Ethics. 3 Credits.**

Lecture 3 hours; 3 credits. Aligned with a spiral approach to learning, students will be introduced to theory, practice, methods, basic principles, and concepts used by counselors in educational settings and community agencies. In subsequent courses, these topics will be revisited in depth. The course will emphasize professional and ethical issues related to counseling.

COUN 631. Counseling for Lifespan Development. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisites: Admission to Counseling Graduate Program or graduate program director approval. A study of phase and stage theories of lifespan development with application to counseling. Current research findings on major developmental issues (e.g., gender) will be emphasized.

COUN 633. Counseling and Psychotherapy Techniques. 3 Credits.

The course focuses on development of attitudes and skills essential to effective professional counseling. Emphasis is on conducting the helping interview, as well as conducting an intake interview, a mental status evaluation, a biopsychosocial history, a mental health history, and a psychological assessment for treatment planning and caseload management. Pre- or corequisite: Admission to Counseling Graduate Program or Graduate Program Director approval.

COUN 634. Advanced Counseling and Psychotherapy Techniques. 3 Credits.

Advanced skills and practice in techniques used by counselors. Prerequisite: COUN 633 with a grade of B or higher.

COUN 642. Structured Counseling Groups. 3 Credits.

This course is designed to prepare students to facilitate structured counseling groups for children, adolescents and adults in a variety of settings. Prerequisites: Admission to Counseling graduate program or graduate program director approval; COUN 601, COUN 633 & COUN 650.

COUN 644. Group Counseling and Psychotherapy. 3 Credits.

Developing effective group leadership competencies is the focus for the course. Identification of group dynamics, use of group level process, and the self-development of the leader are some major topics. Prerequisite: Admission to Counseling graduate program or graduate program director approval; COUN 601, COUN 633, and COUN 650.

COUN 645. Testing and Client Assessment. 3 Credits.

This course examines individual and group approaches to formal and informal assessment techniques, including diagnosis. It includes an examination of: the history of assessment; basic test statistics; test worthiness (reliability, validity, and cross-cultural issues); the selection, administration, and interpretation of assessment instruments; and ethical and legal issues relative to assessment. The focus of this class is on major concepts and principles of psychological testing and evaluation and use of standardized instruments with differing populations. Pre- or corequisites: COUN 633.

COUN 647. Addictive Disorders. 3 Credits.

Examines the etiology, risk factors, assessment, counseling approaches and treatment of alcoholism and other addictions. Prerequisites: Admission to Counseling graduate program or graduate program director approval; COUN 601, COUN 633, and COUN 650.

COUN 648. Foundations of Career Development. 3 Credits.

Principles and theories of career development, occupational and educational information, employment trends, concepts and principles for effective work in educational and career planning and development are considered. Prerequisites: Admission to Counseling graduate program or graduate program director approval; COUN 601, COUN 645, and COUN 650.

COUN 650. Theories of Counseling and Psychotherapy. 3 Credits.

Lecture 3 hours; 3 credits. A study of major theories of counseling and psychotherapy. The primary focus is on providing students with a theoretical foundation upon which to develop their own approach for providing counseling and psychotherapy.

COUN 655. Social and Cultural Issues in Counseling. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisites: Admission to Counseling Graduate Program or graduate program director approval. Designed to engage helping professionals in cultural self-awareness and the search for solutions to disparities in society through counseling work. Emphasis on the social identities of gender, race, ethnicity, religion, ability, class, sexual orientation, and age.

COUN 665. Internship in Community Counseling. 1-6 Credits.

3-6 credits. Prerequisites: Departmental Permission. This internship is designed to provide individual students with a planned program of advanced on-the-job professional experience in a community agency counseling agency. A university instructor will coordinate internship assignments. An experienced professional in the community agency setting will provide direct supervision. Available for pass/fail grading only.

COUN 666. Internship in College Counseling. 1-6 Credits.

This internship is designed to provide individual students with a planned program of advanced on-the-job professional experience in a college or university setting. A university instructor will coordinate internship assignments. An experienced professional in the college or university setting will provide direct supervision. Available for pass/fail grading only. Prerequisites: Departmental permission and COUN 601, COUN 633, COUN 634, COUN 644, COUN 645, COUN 648, COUN 650, COUN 669, COUN 685, and COUN 686.

COUN 667. Internship in Mental Health Counseling. 1-9 Credits.

This counselor education experience is designed to provide a planned program of supervised clinical instruction in mental health counseling in an appropriate professional setting, including provision of direct service and performance of indirect professional activities under appropriate clinical supervision of a site supervisor as well as classroom instruction and supervision. This pass/fail course requires successful completion of 450 hours of counseling field placement work and 180 hours of direct service in each of two semesters of enrollment. Prerequisites: Admission to the Counseling Graduate Program or graduate program director approval, approved application; COUN 601, COUN 644, COUN 648, COUN 650, COUN 669, COUN 680, and COUN 685.

COUN 668. Internship in School Counseling. 1-6 Credits.

1 - 6 credits. Prerequisite: Admission to the Counseling Graduate Program or graduate director approval; Approved application; COUN 601, 642 or 644, 645, 648, 650, 669, 676, & 678. This internship is designed to provide individual students with a planned program of advanced on-the-job professional experience in a school setting. A university instructor will coordinate internship assignments. An experienced professional in the school setting will provide direct supervision. Available for pass/fail grading only.

COUN 669. Practicum in Counseling. 3 Credits.

This supervised experience will enable students to practice basic and intermediate individual and group counseling skills with clients while integrating knowledge and skills learned in previous course work. Prerequisites: Admission to the Counseling graduate program or graduate director approval; COUN 601, COUN 633, COUN 642 or COUN 644, COUN 650, and COUN 634 with a grade of B or higher (see Program Handbook for other prerequisites based on specialty area).

COUN 670. Introduction to Counseling Supervision. 3 Credits.

This course provides an opportunity to learn one's personal style for supervision, to have supervised field supervision experiences and to gain an understanding of the different models of supervision. Prerequisites: Admission to the Counseling Graduate Program or graduate director approval; COUN 601, COUN 669.

COUN 676. Professional Issues in School Counseling K-12. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisites: Admission to the Counseling Graduate Program or graduate director approval. A professional seminar that emphasizes the contemporary role of the school counselor as leader and advocate in delivering school counseling programs to all students. Emphasis is placed on acquiring the awareness, knowledge and skills necessary to negotiate the cultural, educational, and contextual forces that impact the lives and academic achievement of students in a pluralistic society.

COUN 677. School Culture, Learning, and Classroom Management. 3 Credits.

School counselor's role in contributing to a safe, equitable, and culturally responsive school culture; promoting student learning and achievement; and the practice of effective teaching and classroom management. Cultural, political, economic, ethical, and legal issues are addressed. Prerequisite: Admission to the Counseling graduate program or graduate program director approval; COUN 676.

COUN 678. Counseling Children and Adolescents in School Settings. 3 Credits.

This course will provide an overview of theories and techniques of counseling children and adolescents in school settings. Emphasis will be placed upon the counselor's role as a facilitator of normal developmental processes to promote academic success. Prerequisites: Admission to the Counseling graduate program or graduate director approval; COUN 601, COUN 633, and COUN 650.

COUN 679. School Counseling Program Development K-12. 3 Credits.

This course is designed as a capstone experience that synthesizes graduate course work into a practical school counseling program manual. Emphasis is placed on assessment, data collection and analysis, design and development, implementation and evaluation of systemic school counseling programs K-12. Specific emphasis is given to the integration of assessed needs, the National Standards for School Counseling Programs and the Virginia Standards of Learning. Prerequisites: Admission to the Counseling Graduate Program or graduate director approval; COUN 601, COUN 642 or COUN 644, COUN 648, and COUN 676.

COUN 680. Mental Health Counseling. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisites: Admission to the Counseling Graduate Program or graduate director approval. This course will examine the broad range of roles and functions of the mental health counselor within contemporary professional practice settings.

COUN 681. Couples Counseling. 3 Credits.

Couples counseling focuses on development of effective counseling skills in working with couples. Prerequisites: Admission to the Counseling graduate program or graduate director approval; COUN 601, COUN 633, and COUN 650.

COUN 685. Diagnosis and Treatment Planning in Mental Health Counseling. 3 Credits.

A course focused on developing knowledge, attitudes, and skills essential to effective DSM-IV diagnosis, client conceptualization assessment, and clinical treatment planning. Emphasis on the use of client conceptualization models as a basis for treatment planning in mental health counseling. Prerequisites: Admission to the Counseling graduate program or graduate director approval; COUN 601, COUN 633, and COUN 650.

COUN 686. College Counseling. 3 Credits.

Lecture, 3 hours; 3 credits. Prerequisite: Admission to the Counseling Graduate Program or Graduate program director approval. Overview of counseling services provided on college and university campuses. Topics include wellness of students, multicultural issues, ethical and legal issues, crisis and disaster response, advocacy, and program evaluation.

COUN 689. Understanding Military Connected Children and Families. 4 Credits.

Lecture, 3 hours; Service Learning, 2 hours. 4 credits. Prerequisite: Acceptance into the Military Child and Families Graduate Certificate Program. Approval of the Certificate Program Director REQUIRED. Participants will learn about the unique academic, social, and emotional challenges faced by military connected children and their families. Participants will review, analyze and practice research-based learning and behavioral strategies and interventions to address these needs. This course will also introduce effective practices for supporting children through deployment separation, reunion and reintegration, and grief and trauma, including promoting school connectedness, fostering resiliency, facilitating coping skills, and designing customized academic, social, and behavioral supports. This course is required for completion of the Military Child and Family Education graduate certificate.

COUN 691. Family Systems and Family Development. 3 Credits.

The course offers a study of the family as a system, family life cycle stages, tasks, and difficulties that families may experience as they move through their developmental stages. Concepts and principles applicable to helping people within a systems perspective will also be discussed. Prerequisites: Admission to the Counseling graduate program or graduate director approval; COUN 601, COUN 633, and COUN 650.

COUN 695. Topics in Counseling. 3 Credits.

Lecture 1-6 hours; 1-6 credits. Prerequisites: Admission to the Counseling Graduate Program or graduate director approval. The study of selected topics in counseling.

COUN 707. Adult and College Student Development. 3 Credits.

Lecture and discussion 3 hours; 3 credits. Exploration of theories informing practice regarding late adolescent, young adult, and adult psychological and cognitive development, adjustment, and learning in the two- and four-year college and university context. Influences of individual differences highlighted. Applications for college counseling, higher education, and community college practitioners, professionals, and leaders.

COUN 708. Constructivist Counseling and Positive Adult Development. 3 Credits.

This seminar-style course is an introduction to the fundamental constructivist principles that drive much of progressive adult education and counseling. Included are an introduction to developmental constructivism, social construction, post-modernism, and the narrative turn in counseling. Applications to counseling, education, and leadership will be made and implications for students' own development will be examined.

COUN 742. Advanced Counseling Theory and Practice. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisites: COUN 601, 630, 633, 645 and 650. An in-depth study of selected counseling theories through the study of cases.

COUN 744. Advanced Group Counseling. 3 Credits.

3 hours; 3 credits. Prerequisites: COUN 601, 630, 633, 644, 645, and 650. Development of group leadership skills through group experiences in class and in the field.

COUN 747. Chemical Dependency Counseling. 3 Credits.**COUN 781. Family Therapy. 3 Credits.**

Lecture 3 hours; 3 credits. Prerequisites: COUN 601, 630, 633, 644, 645, and 650. A study of theories and practice of family therapy.

COUN 783. Complementary and Alternative Therapies. 3 Credits.

This course provides an overview of complementary and alternative therapies being used in mental health today, looking at their effectiveness and safety in treating specific client populations and for use in treating specific disorders, including ADHD, addictions, and anxiety. Modalities covered include acupuncture, nutritional medicine, herbal medicine, biofeedback, meditation, hypnotherapy, aromatherapy, and others. Prerequisites: Admission to the Counseling graduate program or graduate program director approval.

COUN 786. Spirituality in Counseling. 3 Credits.

An overview of methods for integrating spirituality into counseling as a means of promoting holistic wellness for both clients and counselors. Emphasis will be placed upon theories of spiritual development, beliefs inherent in major wisdom traditions, implicit and explicit strategies for integrating spirituality into counseling, and the counselor's own personal and professional awareness and growth.

COUN 795. Topics in Counseling. 1-6 Credits.

Lecture 1-6 hours; 1-6 credits. The study of selected topics in counseling.

COUN 797. Topics in Counseling. 1-6 Credits.

Consultation 1-6 hours; 1-6 credits. Individual study under the supervision of a graduate faculty member.

COUN 801. Current Issues in Counseling and Counselor Education. 3 Credits.

Lecture 3 hours; 3 credits. The course will focus on the current issues in counseling to include the role of ethical and legal considerations in counselor education and supervision, social and cultural issues to include social change theory and advocacy action planning, and developmental counseling.

COUN 807. Adult and College Student Development. 3 Credits.

Lecture and discussion 3 hours; 3 credits. Exploration of theories informing practice regarding late adolescent, young adult, and adult psychological and cognitive development, adjustment, and learning in the two- and four-year college and university context. Influences of individual differences highlighted. Applications for college counseling, higher education, and community college practitioners, professionals, and leaders.

COUN 808. Constructivist Counseling and Positive Adult Development. 3 Credits.

This seminar-style course is an introduction to the fundamental constructivist principles that drive much of progressive adult education and counseling. Included are an introduction to developmental constructivism, social construction, post-modernism, and the narrative turn in counseling. Applications to counseling, education, and leadership will be made and implications for students' own development will be examined.

COUN 820. Counselor Education Teaching and Practice. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisites: three or more seminars presented by campus Instructional Support Services to include Blackboard, Development of Syllabi, Televised Instruction and Classroom Assessment. This course prepares students to teach counseling and related courses. Topics covered are learning theories, retention of material, motivation, classroom instructional strategies and techniques, and assessment of learning from the core learning expectations. Students will teach a semester course under supervision of the instructor.

COUN 835. Advanced Counseling Research Design and Assessment. 3 Credits.

The doctoral-level course examines advanced topics and controversies in qualitative and quantitative counseling research; this integration of theoretical with applied counseling material will augment the department's standard doctoral research offerings. Prerequisites: FOUN 814 and FOUN 722.

COUN 842. Advanced Counseling Theory and Practice. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisites: COUN 601, 630, 633, 645 and 650. An in-depth study of selected counseling theories through the study of cases.

COUN 844. Advanced Group Counseling. 3 Credits.

3 hours; 3 credits. Prerequisites: COUN 601, 630, 633, 644, 645, and 650. Development of group leadership skills through group experiences in class and in the field.

COUN 845. Diagnosis and Treatment Planning. 3 Credits.**COUN 846. Advanced Counseling Supervision. 3 Credits.**

This course provides advanced training and skill development in supervision. Specific topics in supervision will also be examined. These include: ethical and legal issues, multicultural competency in supervision; theories of counselor development; theories/models, processes, and skills in supervision.

COUN 847. Chemical Dependency Counseling. 3 Credits.**COUN 848. Multicultural Perspectives in Counselor Education, Supervision, and Research. 3 Credits.**

Lecture 3 hours; 3 credits. Prerequisites: Admission to PhD Program or Graduate Program Director Approval. Counseling doctoral students will study multicultural issues in counselor preparation graduate programs, counseling supervision, and counseling research.

COUN 864. Practicum in Counselor Education. 3 Credits.

Supervised practicum in a counseling graduate program. Teach a 3-credit counseling graduate course under supervision. Participant in program meetings and activities. Minimum of 200 contact hours.

COUN 865. Practicum in Clinical Mental Health Counseling Leadership. 3 Credits.

Supervised practicum in a mental health counseling agency or organization. Participate in management and leadership activities. Minimum of 200 hours. Prerequisites: Admission to the Counseling Graduate Program or graduate program director approval.

COUN 866. Practicum in College Counseling Leadership. 3 Credits.

Supervised practicum in a community college, four-year college, or university counseling unit. Participate in unit management and leadership activities. Minimum of 200 hours.

COUN 867. Practicum in School Counseling Leadership. 3 Credits.

Practicum. 3 credits. Supervised practicum in district level school counseling leadership office. Participate in office management and leadership activities. Minimum of 200 hours.

COUN 868. Internship in Counseling. 3-6 Credits.

This internship is designed to provide individual students with a planned program of advanced on-the-job professional experience in a college or community/agency setting. Internship assignments will be controlled and coordinated by a university instructor. Direct supervision is given by an experienced professional in the setting. Minimum of 600 hours.

COUN 869. Advanced Supervised Practicum in Counseling. 3 Credits.

Prerequisites: COUN 801, COUN 820, COUN 742/COUN 842, COUN 744/COUN 844. This advanced supervised practicum in counseling experience will enable doctoral-level students to develop and/or refine advanced counseling skills and conceptually link counselor practice and supervision. Minimum of 200 hours.

COUN 881. Family Therapy. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisites: COUN 601, 630, 633, 644, 645, and 650. A study of theories and practice of family therapy.

COUN 883. Complementary & Alternative Therapies in Mental Health Counseling. 3 Credits.

The course provides an overview of complementary and alternative therapies being used in mental health today, looking at their effectiveness and safety in treating specific client populations and for use in treating specific disorders, including ADHD, depression, addictions, and anxiety. Modalities covered include acupuncture, nutritional medicine, herbal medicine, biofeedback, meditation, hypnotherapy, aromatherapy, and others. Prerequisites: Admission to the Counseling graduate program or graduate program director approval.

COUN 886. Spirituality in Counseling. 3 Credits.

An overview of methods for integrating spirituality into counseling as a means of promoting holistic wellness for both clients and counselors. Emphasis will be placed upon theories of spiritual development, beliefs inherent in major wisdom traditions, implicit and explicit strategies for integrating spirituality into counseling, and the counselor's own personal and professional awareness and growth.

COUN 895. Topics in Counseling. 1-6 Credits.

Lecture 1-6 hours; 1-6 credits. The study of selected topics in counseling.

COUN 897. Topics in Counseling. 1-6 Credits.

Consultation 1-6 hours; 1-6 credits. Individual study under the supervision of a graduate faculty member.

COUN 898. Dissertation Seminar. 3 Credits.

This seminar is designed to assist students in making substantive progress in identifying and developing their dissertation proposal. Students will critically examine the current literature associated with their research interests and examine applicable conceptual constructs and methodologies.

COUN 899. Dissertation. 1-12 Credits.

1-12 credits.

COUN 998. COUN 998. 1 Credit.**COUN 999. Counseling 999. 1 Credit.**

CRIM - Criminology

CRIMINOLOGY Courses

CRIM 700. Proseminar in Criminology and Criminal Justice. 3 Credits.

This course provides students with a broad overview of enduring topics and emerging issues in criminology and criminal justice. It also explores the history and role of criminology as an academic discipline and criminal justice as an institutional system in American society.

CRIM 701. Criminology and Public Policy. 3 Credits.

This course covers the policy process as it relates to crime legislation, criminological theory and implications for public policy.

CRIM 702. Advanced Criminological Theory. 3 Credits.

This course is an examination of criminological theory for the advanced student. The focus is on critical analysis of both contemporary and historical criminological theories. In order to aid in the development of a critical understanding of theory, beyond understanding the content of central theories, the class focuses on discussion of theory development and testing. In addition, the class focuses on an understanding of the relationship of one theory to another as well as the state of empirical evidence surrounding each theory.

CRIM 703. Inequality, Crime and Justice. 3 Credits.

This course examines the linkages between social characteristics and crime. The course concentrates on what we know about the impact of gender, age, race and social class on crime and criminal justice.

CRIM 705. Multivariate Statistics in Criminological Research. 3 Credits.

This course teaches multivariate statistical techniques to train criminal justice researchers and policy makers to explore the causes and consequences of crime and criminal justice policies. Although the exact statistical techniques covered may vary, they will typically include multiple regression, multiple discriminate analysis, logistic regression, factor analysis, cluster analysis and path analysis.

CRIM 710. Qualitative Methods in Criminology and Criminal Justice. 3 Credits.

The central goal of this graduate seminar is to enable students to create and critique qualitative research designs focused on contemporary issues in criminology and criminal justice. A number of qualitative approaches will be covered including field observational research, focused interviews, case studies and content analysis. The seminar explores techniques, strengths and limitations of these varied qualitative methodologies.

CRIM 715. Advanced Quantitative Techniques in Criminology & Criminal Justice. 3 Credits.

This course explores advanced statistical techniques commonly used in research on crime and justice. The major focus of the course will be hierarchical linear modeling (HLM), a diverse set of techniques that extend standard multivariate analysis to accommodate nested data. Other advanced techniques will also be covered: event history/survival models, time series, etc.

CRIM 720. Advanced Research Methods in Criminology & Criminal Justice. 3 Credits.

This course provides students with advanced understanding of issues in criminology/criminal justice research including: history, philosophy, sociology, epistemology, politics and ethics of social science research; methodological questions of reliability, validity, conceptualization, operationalization, scale construction, data collection methodologies, sampling.

CRIM 740. Social Structures, Crime and Justice. 3 Credits.

This course examines the links between social structures and institutions, and justice at the individual, neighborhood, city, state and country levels. Students explore the ways in which structures and institutions are both agents of social control and facilitators or initiators of crime. Emphasis will be placed on theories, methodologies and empirical assessments.

CRIM 745. Crime and Communities. 3 Credits.

This course provides a foundation of the most important theories and research relating to residential communities and crime. The casual linkages between features of neighborhoods and social disorder will be explored in the context of criminological theories. Students will emerge with sufficient knowledge to develop a class or design a significant research project.

CRIM 750. Crimes of the State. 3 Credits.

This course explores crimes of the state from a sociological and criminological perspective by examining historical and current cases of governmental crime. This will cover the history, theory and method of the field; controls of and constraints on state crime; and cases of state crime.

CRIM 755. Researching the Criminal Justice System. 3 Credits.

Students will develop original research projects on the criminal justice system, police, courts and /or corrections. Projects will be designed to culminate in a publishable paper.

CRIM 760. Life Course Criminology. 3 Credits.

This course is designed to introduce graduate students to life-course perspectives for understanding crime and deviant behavior. Students discuss the various methodologies, both quantitative and qualitative, most commonly found in studies of the life course today.

CRIM 795. Topics in Criminal Justice. 1-3 Credits.

Topics vary by semester.

CRIM 797. Independent Study. 1-3 Credits.

Supervised independent study arranged with instructor and approved by graduate program director.

CRIM 800. Proseminar in Criminology and Criminal Justice. 3 Credits.

This course provides students with a broad overview of enduring topics and emerging issues in criminology and criminal justice. It also explores the history and role of criminology as an academic discipline and criminal justice as an institutional system in American society.

CRIM 801. Criminology and Public Policy. 3 Credits.

To familiarize students with the policy process as it relates to crime legislation, criminological theory and implications for public policy.

CRIM 802. Advanced Criminological Theory. 3 Credits.

This course is an examination of criminological theory for the advanced student. The focus is on critical analysis of both contemporary and historical criminological theories. In order to aid in the development of a critical understanding of theory, beyond understanding the content of central theories, the class focuses on discussion of theory development and testing. In addition, the class focuses on an understanding of the relationship of one theory to another as well as the state of empirical evidence surrounding each theory.

CRIM 803. Inequality, Crime and Justice. 3 Credits.

This course examines the linkages between social characteristics and crime. The course concentrates on what is known about the impact of gender, age, race and social class on crime and criminal justice.

CRIM 805. Multivariate Statistics in Criminological Research. 3 Credits.

This course teaches multivariate statistical techniques to train criminal justice researchers and policy makers to explore the causes and consequences of crime and criminal justices policies. Although the exact statistical techniques covered may vary, they will typically include multiple regression, multiple discriminate analysis, logistic regression, factor analysis, cluster analysis and path analysis.

CRIM 810. Qualitative Methods in Criminology and Criminal Justice. 3 Credits.

The central goal of this graduate seminar is to enable students to create and critique qualitative research designs focused on contemporary issues in criminology and criminal justice. A number of qualitative approaches will be covered including field observational research, focused interviews, case studies and content analysis. The seminar explores techniques, strengths and limitations of these varied qualitative methodologies.

CRIM 815. Advanced Quantitative Techniques in Criminology & Criminal Justice. 3 Credits.

This course explores advanced statistical techniques commonly used in research on crime and justice. The major focus of the course is hierarchical linear modeling (HLM), a diverse set of techniques that extend standard multivariate analysis to accommodate nested data. Other advanced techniques are also covered: event history/survival models, time series, etc.

CRIM 820. Advanced Research Methods in Criminology & Criminal Justice. 3 Credits.

This course provides students with advanced understanding of issues in criminology/criminal justice research including: history, philosophy, sociology, epistemology, politics and ethics of social science research; methodological questions of reliability, validity, conceptualization, operationalization, scale construction, data collection methodologies, sampling.

CRIM 840. Social Structures, Crime and Justice. 3 Credits.

This course examines the links between social structures and institutions, and justice at the individual, neighborhood, city, state and country levels. Students explore the ways in which structures and institutions are both agents of social control and facilitators or initiators of crime. Emphasis will be placed on theories, methodologies and empirical assessments.

CRIM 845. Crime and Communities. 3 Credits.

This course provides a foundation of the most important theories and research relating to residential communities and crime. The casual linkages between features of neighborhoods and social disorder will be explored in the context of criminological theories. Students will emerge with sufficient knowledge to develop a class or design a significant research project.

CRIM 850. Crimes of the State. 3 Credits.

This course explores crimes of the state from a sociological and criminological perspective by examining historical and current cases of governmental crime. This course covers the history, theory and method of the field; controls of and constraints on state crime; and cases of state crime.

CRIM 855. Researching the Criminal Justice System. 3 Credits.

Students develop original research projects focusing on the criminal justice system, police, courts and/or corrections. Projects are designed to culminate in a publishable paper.

CRIM 860. Life Course Criminology. 3 Credits.

This course is designed to introduce graduate students to life-course perspectives for understanding crime and deviant behavior. Students discuss the various methodologies, both quantitative and qualitative, most commonly found in studies of the life course today.

CRIM 890. Professional Development and Dissertation Seminar. 3 Credits.

This course enhances the process of professionalization of students by supporting ongoing dissertation progress as well as preparing the student for publishing, grant writing, and the job market.

CRIM 895. Topics in Criminal Justice. 1-3 Credits.

Topics vary by semester.

CRIM 897. Independent Study. 1-3 Credits.

Supervised study arranged with an instructor and approved by the graduate program director.

CRIM 899. Dissertation. 1-9 Credits.

Dissertation hours.

CRIM 998. CRIM 998. 1 Credit.

CRIM 999. Criminology 999. 1 Credit.

Continued dissertation hours.

CRJS - Criminal Justice

CRIMINAL JUSTICE Courses

CRJS 501. Understanding Violence. 3 Credits.

Examines a variety of forms of violence from suicide, child abuse, rape and family violence to terrorism, torture, death squads and the death penalty, and hate violence. Explores the circumstances, rationalizations, patterns, explanations and effects on survivors.

CRJS 510. Correctional Treatment. 3 Credits.

Methods and programs which attempt to correct the behaviors of juvenile delinquents and adult criminal offenders are explored. Treatment strategies employed in both community and institutional settings are examined. Techniques of classification and the role of the correctional worker are also discussed.

CRJS 521. Deviant Behavior. 3 Credits.

A study of various definitions and forms of deviant behavior, theoretical explanations of causes of deviant behavior, and the impact of deviant behavior on society and the individual.

CRJS 526. Criminological Theory. 3 Credits.

An in-depth study of the major theoretical issues in criminology. Deals extensively with issues of crime causation.

CRJS 527. Violence Against Women. 3 Credits.

A critical analysis of violence against women as an institution of social control. Examines violence in the context of social and political inequality and feminist critique. Issues explored include pornography, prostitution, sexual harassment, incest, battering and rape.

CRJS 541. Drugs and Society. 3 Credits.

The study of sociological and social psychological explanations of drug-using behaviors and of legal and medical control of drugs. Topics include changes in the legal status of drugs, cross-cultural and historical variations in the control of drugs, and social epidemiology of drug use in contemporary society.

CRJS 548. Women, Sex Discrimination and the Law. 3 Credits.

This course introduces students to legal issues which specifically affect women and examines historical attitudes that have been used to justify differential treatment of women. It explores various legal approaches used to achieve equal protection under the law and examines a variety of specific topics such as: the equal protection analysis; Title VII and Title IX and their relationship to sex discrimination; affirmative action; and reproductive freedom.

CRJS 550. Blacks, Crime and Justice. 3 Credits.

Examines historical and contemporary theories and research on African-Americans, criminal behavior and the administration of justice. Selected topics will include African-American perspectives, the death penalty, victimization, police brutality, and justice systems in Africa and the Caribbean.

CRJS 562. Substantive Criminal Law. 3 Credits.

This course deals with the major substantive concepts involved in American criminal law, including development of criminal law, elements of criminal liability, defenses against criminal responsibility, and descriptions and definitions of specific offenses.

CRJS 575. Criminal Justice Systems Around the World. 3 Credits.

The study of criminal justice systems around the world in order to understand how criminal behavior is defined and responded to in various cultures. Cultural differences will be highlighted in order to recognize that definitions of and responses to crimes closely reflect the cultures in which they exist.

CRJS 595. Topics in Criminal Justice. 3 Credits.

The advanced study of selected topics designed to permit small groups of qualified students to work on subjects of mutual interest which, due to their specialized nature, may not be offered regularly. These courses will appear in the course schedule, and will be more fully described in information distributed to academic advisors.

CRJS 596. Topics in Criminal Justice. 3 Credits.

The advanced study of selected topics designed to permit small groups of qualified students to work on subjects of mutual interest which, due to their specialized nature, may not be offered regularly. These courses will appear in the course schedule, and will be more fully described in information distributed to academic advisors.

CRJS 597. Tutorial Work in Special Topics in Criminal Justice. 1-3 Credits.

Independent reading and study on a topic to be selected under the direction of an instructor. Conferences and papers as appropriate.

CRJS 598. Tutorial Work in Special Topics in Criminal Justice. 1-3 Credits.

Independent reading and study on a topic to be selected under the direction of an instructor. Conferences and papers as appropriate.

CRJS 620. Criminological Theory. 3 Credits.

An in-depth study of the major theoretical issues in criminology. The course deals extensively with issues of crime causation, the way theory shapes and informs the study of crime and related social issues, and the relationship between theory, research, and practice.

CRJS 625. The Administration of Criminal Justice. 3 Credits.

An analysis of the criminal justice system with an emphasis on the decision-making responsibilities of its officials.

CRJS 627. Violence Against Women. 3 Credits.

This course examines the many ways in which violence against women functions as an agent of social control. Violence is viewed on a continuum in order to determine how a variety of acts contribute to the subordination of women. Specific types of violence are explored including: wife assault, rape, incest, sexual harassment and pornography.

CRJS 650. Research Seminar. 3 Credits.

This seminar integrates the skills needed to complete a master's thesis. Exercises include formulating research questions, developing a research design, and writing a publishable paper. Students practice these skills through assignments in class and by completing their thesis proposal. Prerequisites: SOC 610 or CRJS 610, SOC 620 or CRJS 620, SOC 630 or CRJS 630, and SOC 640 or CRJS 640.

CRJS 661. Policing. 3 Credits.

A study of the major issues in law enforcement agencies, personnel and strategies. Topics focus on the impact of social control on the officers and society.

CRJS 662. Criminal Justice and the Law. 3 Credits.

A study of law and its interpretation as it affects the criminal justice system. Includes such issues as the substance of criminal law and the criminal court setting as a social system.

CRJS 663. Corrections. 3 Credits.

A study of society's response to crime through its use of institutional and noninstitutional corrections. Topics include inmate culture, correction officer behavior and community corrections programs.

CRJS 668. Internship. 3 Credits.

Students gain first-hand experience in professional settings which are deemed appropriate given their academic background and career objectives. Students are required to complete a research project that corresponds to their specific internship placement Prerequisites: Permission of the instructor.

CRJS 695. Topics in Criminal Justice. 3 Credits.

Advanced seminars on selected topics in criminal justice. Topics will vary by semester.

CRJS 696. Topics in Criminal Justice. 3 Credits.

Advanced seminars on selected topics in criminal justice. Topics will vary by semester.

CRJS 697. Independent Study in Special Topics in Criminal Justice. 3 Credits.

Independent reading and study on a topic to be selected under the direction of an instructor. Conferences and papers as appropriate. Prerequisites: Approval of the department chair.

CRJS 698. Independent Study in Special Topics in Criminal Justice. 3 Credits.

Independent reading and study on a topic to be selected under the direction of an instructor. Conferences and papers as appropriate. Prerequisites: Approval of the department chair.

CRJS 699. Thesis. 3-9 Credits.

Thesis hours.

CRJS 998. CRJS 998. 1 Credit.

CS - Computer Science

COMPUTER SCIENCE Courses

CS 510. Professional Workforce Development I. 3 Credits.

Lecture 3 hours; recitation 1 hour; 3 credits. Laboratory work required. Provides students with challenges of business environments in developing a technology based project. Students identify a societal problem, identify solutions, define project solutions, develop project objectives, conduct feasibility analysis, establish organizational group structure to meet project objectives and develop formal specifications. Students make formal technical project presentations and develop web documentation. Students prepare a draft grant proposal.

CS 511. Professional Workforce Development II. 3 Credits.

Lecture 3 hours; 3 credits. Laboratory work required. Students write professional and non-technical documents and continue the development of the project defined in CS 410. Written work is reviewed and returned for corrective rewriting. Students will design and develop a project prototype, and demonstrate the prototype to a formal panel along with delivering the formal product specifications and a draft formal grant proposal. (qualifies as a CAP experience) (This is a writing intensive course.)

CS 517. Computational Methods and Software. 3 Credits.

Lecture 3 hours; 3 credits. Laboratory work required. Algorithms and software for fundamental problems in scientific computing. Topics: properties of floating point arithmetic, linear systems of equations, matrix factorizations, stability of algorithms, conditioning of problems, least-squares problems, eigenvalue computations, numerical integration and differentiation, nonlinear equations, iterative solution of linear systems.

CS 518. Web Programming. 3 Credits.

Lecture 3 hours; 3 credits. Laboratory work required. Overview of Internet and World Wide Web; web servers and security, HTTP protocol; web application and design; server side scripts and database integration, and programming for the Web.

CS 531. Web Server Design. 3 Credits.

Laboratory work required. Extensive coverage of the hypertext transfer protocol (HTTP), specifications and commentary (IETF RFCs), and implications for servers and clients. Students will develop a web server providing common HTTP functionality and implementing all HTTP (including unsafe and conditional) methods, content negotiation, transfer and content encoding, basic & digest authentication, and server-side execution of programs (i.e., dynamic resources). Frequent in-class demonstrations of progress and protocol conformance will be required. Prerequisites: Familiarity with Internet and network (including socket) programming.

CS 541. App Development for Smart Devices. 3 Credits.

Laboratory work required. Project-oriented coverage of the principles of application design and development for Android platform smart devices. Topics include user interface; input methods; data handling; network techniques; localization and sensing. Students are required to produce a professional-quality mobile application. Prerequisites: Knowledge of Java.

CS 550. Database Concepts. 3 Credits.

Laboratory work required. Three level database architecture. The relational database model and relational algebra. SQL and its use in database procedures and with conventional programming languages. Entity relationship modeling. Functional dependencies and normalization. Transactions, concurrency and recovery. Prerequisites: Familiarity with elementary set theory, propositional logic, and any two programming languages are expected; a course in finite mathematics or discrete structures is recommended.

CS 551. Software Engineering Survey. 3 Credits.

Lecture 3 hours; 3 credits. Laboratory work required. Evaluation of software development methodologies. Topics include: software life cycle models, software specification and design methodologies, informal specification techniques, formal specifications, design tools, software analysis, quality assurance, life cycle management, software costing models and complexity.

CS 554. Network Management. 3 Credits.

Lecture 3 hours; 3 credits. Laboratory work required. The administration of computer networks and their interaction with wide area networks: network topologies for local and wide area networks, common protocols and services, management of distributed file services, routing and configuration, security, monitoring and trouble-shooting.

CS 555. Introduction to Networks and Communications. 3 Credits.

Internet and the 5-layered protocol architecture for the Internet, applications built on top of data networks, specifically the Internet, the web, the transport layer, TCP and UDP protocols, the network layer, the data link layer, also some of the technologies for the physical layer. Prerequisites: Familiarity with C++ or Java programming for Unix systems.

CS 556. Database Administration I. 3 Credits.

Lecture 3 hours; 3 credits. Laboratory work required. Programming in SQL and PL/SQL and hands-on development of DBA administration skills in the ORACLE database environment. Creating database objects, querying and manipulating, and PL/SQL programming constructs. Setup and administer databases. Create, organize, and manage database files, users, privileges and other resources.

CS 557. Database Administration II. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: A grade of C or better in CS 556. Laboratory work required. Advanced DBA administration skills in the Oracle database environment. Topics in planning and implementing backup and recovery of the database. Performance optimization and tuning of database and applications including memory and disk structures. Configuration and maintenance of clients and servers in a network environment.

CS 558. Unix System Administration. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: experience with UNIX. Laboratory work required. Aspects of administering a SOLARIS/UNIX operating system in a networked environment are covered. Topics covered include installation, file system management, backup procedures, process control, user administration, device management, Network File Systems (NFS), Network Information Systems (NIS), UNIX security, Domain Name Services (DNS), and integration with other operating systems.

CS 560. Computer Graphics. 3 Credits.

Lecture 3 hours; 3 credits. Laboratory work required. An introduction to graphical systems and methods. Topics include basic primitives, windowing, transformations, hardware, interaction devices, 3-D graphics, curved surfaces, solids, and realism techniques such as visible surface, lighting, shadows, and surface detail. Requires project involving OpenGL programming.

CS 562. Cybersecurity Fundamentals. 3 Credits.

The course introduces the basic components and concepts needed for understanding cybersecurity. These include basics and security vulnerabilities of networks, operating systems, databases, and distributed systems. In addition, some fundamentals of security enforcement will be introduced and discussed.

CS 563. Cryptography for Cybersecurity. 3 Credits.

Mathematical foundations including information theory, number theory, factoring, and prime number generation; Cryptographic protocols including basic building blocks and protocols; Cryptographic techniques including key generation and key management, and applications; Cryptographic algorithms--DES, AES, Stream Ciphers, Hash functions, digital signatures, etc. Prerequisite: CS 270.

CS 564. Networked Systems Security. 3 Credits.

Authentication in cyber systems including password-based, address-based, biometrics-based, and SSO systems; Authorization and accounting in cyber systems; Securing wired and wireless networks; Secured applications including secure e-mail services, secure web services, and secure e-commerce applications; Security and privacy in cloud environments.

CS 565. Information Assurance. 3 Credits.

Introduction to information assurance. Metrics, planning and deployment; identity and trust technologies; verification and evaluation, incident response; human factors; regulation, policy languages, and enforcement; legal, ethical, and social implications; privacy and security trade-offs; system survivability; intrusion detection; fault and security management. Prerequisites: CS 562 or familiarity with computer security area.

CS 575. Introduction to Computer Simulation. 3 Credits.

Lecture 3 hours; 3 credits. Efficient implementation methods. Time management. Planning and design of simulation experiments. Statistical issues in simulation. Generation of random numbers and stochastic variates. Programming with graphically- and text-based simulation languages. Verification and validation of simulation models. Distributed simulation. Special topics such as HLA will be discussed.

CS 576. Systems Programming. 3 Credits.

Lecture 3 hours; 3 credits. Laboratory work required. This course is to help students fully understand and utilize the internal workings and capabilities provided by modern computing, networking and programming environments. Topics include: Shell Script Programming, X Windows (Xlib and Motif), UNIX internals (I/O, Processes, Threads, IPC and Signals), Network Programming (UDP/TCP Sockets and Multicasting) and Java Systems Programming (SWING, Multithreading and Networking).

CS 578. Computational Geometry, Methods and Applications. 3 Credits.

The discipline of Computational Geometry is devoted to the study of algorithms which are formulated in terms of spatially embedded arrangements of objects, such as points, lines, surfaces, and solids. This course covers fundamental algorithms including convex hulls, polygon triangulations, point location, Voronoi diagrams, Delaunaytriangulations, binary space partitions, quadtrees, and other topics.

CS 580. Introduction to Artificial Intelligence. 3 Credits.

Lecture 3 hours; 3 credits. Laboratory work required. Introduction to concepts, principles, challenges, and research in major areas of AI. Areas of discussion include: natural language and vision processing, machine learning, machine logic and reasoning, robotics, expert and mundane systems.

CS 586. Introduction to Parallel Computing. 3 Credits.

Lecture 3 hours; 3 credits. Laboratory work required. The motivation for and successes of parallel computing. A taxonomy of commercially available parallel computers. Strategies for parallel decompositions. Parallel performance metrics. Parallel algorithms and their relation to corresponding serial algorithms. Numerous examples from scientific computing, mainly in linear algebra and differential equations. Implementations using public-domain network libraries on workstation clusters and computers.

CS 588. Principles of Compiler Construction. 3 Credits.

Lecture 3 hours; 3 credits. Laboratory work required. Theoretical and practical aspects of compiler design and implementation. Topics will include lexical analysis, parsing, translation, code generation, optimization, and error handling.

CS 595. Topics in Computer Science. 1-3 Credits.

Special topics.

CS 597. Independent Study in Computer Science. 1-3 Credits.

1-3 credits. Prerequisite: permission of the instructor. Independent study under the direction of an instructor.

CS 600. Algorithms and Data Structures. 3 Credits.

Lecture 3 hours; 3 credits. Design of efficient algorithms and the mathematical analysis of their performance. Topics to be covered include: mathematical preliminaries, sorting and order statistics, advanced data structures, linear programming, exploring graphs, parallel algorithms, randomized algorithms, transformation of the domain, and NP-completeness. (offered fall).

CS 635. Parallel Computer Architecture. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: CS 665. This is a first course in parallel architecture, with an emphasis on the description and evaluation of commercially available machines. Topics to be covered include: parallelization and performance metrics, scalability and the "laws" of Amdahl and Gustafson, computational similarity, models of computation, parallelization paradigms, network characteristics and topology, communication calculus and templates, pipelining and parallelism, processor types, memory hierarchy, cache coherence protocols, latency-hiding mechanisms, routing algorithms, and languages and libraries to support parallel architecture.

CS 656. Database Methodology. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: CS 550. Laboratory work required. Analysis, design and implementation of databases and database applications using modern software engineering methods. Database CASE tools. Analysis using process, function, and dataflow analysis in conjunction with entity relationship modeling. Database diagrams and database design. Application suite design and high level design of applications. Refining implementations.

CS 660. 3D Computer Graphics. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: CS 560. Laboratory work required. The mathematical tools needed for the geometrical aspects of 3D computer graphics. Fundamentals: homogeneous coordinates, transformations and perspective. Theory of parametric and implicit curve and surface models: polar forms, Bezier arcs and de Casteljau subdivision, continuity constraints, B-splines, tensor product, and triangular patch surfaces. Representations of solids and conversions among them. Beometric algorithms for graphics problems, with applications to ray tracing, hidden surface elimination, etc.

CS 665. Computer Architecture. 3 Credits.

Lecture 3 hours; 3 credits. A detailed and quantitative study of the architecture of modern uni-processor computers. The major components are: the technology drivers, performance measures, instruction sets (including 80X86, VAX, and a generic RISC which is very similar to the MIPS series), processor implementation, advanced pipelining and superscalar features, cache and memory design, and I/O. The emphasis is on obtaining quantitative measures of performance, describing interactions of the various components, studying trade-offs between the components in commercial processors, and integration into a complete computer system including interaction of the software and hardware. (offered spring).

CS 667. Cooperative Education. 1-3 Credits.**CS 669. Practicum. 1-3 Credits.****CS 690. Colloquium. 1 Credit.**

Lecture 1 hour; 1 credit. A one-hour weekly lecture given by faculty from Old Dominion and other institutions.

CS 695. Topics. 1-3 Credits.**CS 697. Independent Study in Computer Science. 1-3 Credits.**

1-3 credits. Prerequisite: permission of the instructor.

CS 698. Master's Project. 3 Credits.

3 credits. Departmental permission required.

CS 699. Thesis Research. 3 Credits.

3 credits. Departmental permission required.

CS 710. Applied Algorithms. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: CS 600. Laboratory work required. The course will involve solving two or three comprehensive projects anchored in computer science and engineering. Possible topics for projects include: computational issues in network design and analysis; scheduling problems and applications; digital geometry and pattern recognition; image processing and computer vision applications; robotics. The basic thrust is to demonstrate the usefulness and power of algorithm design and analysis in solving real-life problems.

CS 711. Software Validation. 3 Credits.

Lecture 3 hours; 3 credits. Laboratory work required. The most common path to improved confidence in a program is via testing. This course explores divergent and sometimes conflicting approaches to conducting testing and to measuring the resulting confidence. Topics include the theoretical basis for testing, common testing methods, statistical measures of program reliability, and the relationship between correctness and reliability.

CS 712. Stochastic Modeling. 3 Credits.

Stochastic processes are ways of quantifying the dynamic relationship of sequences of random events. This course will expose the participants to standard concepts and methods of stochastic modeling, as well as the rich diversity of applications. Topics include, but not limited to, Markov chains in discrete and continuous time, Poisson processes, renewal theory and branching processes.

CS 713. Modeling and Simulation in Computational Biology. 3 Credits.

This course covers current problems and state of computations in bimolecular modeling, molecular mechanics including force field origin, composition, and evaluation techniques, and simulation techniques including conformational sampling, geometry optimization, molecular dynamics and Brownian dynamics.

CS 714. Monte Carlo Simulation. 3 Credits.

This course serves to illustrate important principles in Monte Carlo simulation methods and to demonstrate their power in applications. The course covers Metropolis-Hastings algorithm, Gibbs sampler, Markov Chain Monte Carlo, acceptance-rejection method, Monte Carlo integration, quasi-Monte Carlo, random walk, and random number generation.

CS 715. Medical Image Computing and Simulation. 3 Credits.

This course combines the theory and practices in medical imaging computing with emphasis on Image Guided Therapy (IGT). Topics include rigid registration, approximation/interpolation, segmentation, no-rigid registration, image-to-mesh conversion, real time parallel computing, software development for medical applications and solution of large sparse linear systems.

CS 716. Communication Networks Simulation and Evaluation. 3 Credits.

This course introduces the foundations and the application of computer network simulations. Topics include the modeling of real-world networks with specific devices and protocols, the identification of key performance parameters, the test of performance and the verification and optimization using comparisons of measured and simulated data.

CS 717. Bioinformatics I – NonCS. 3 Credits.

Lecture, 3 hours; 3 credits. Prerequisite: permission of instructor. This is a bioinformatics course for non-CS majors. It introduces the fundamental topics in bioinformatics: introduction to molecular biology, pair-wise sequence alignment, database search methods such as FASTA and BLAST, multiple sequence alignment, genome scale alignment, protein secondary structure prediction and protein tertiary structure prediction.

CS 722. Machine Learning. 3 Credits.

This course presents both the foundational and the practical aspects of modeling, analyzing, and mining of computerized data sets, including classification, regression, clustering, semi-supervised learning, structured sparsity learning, etc. The course assignments are designed to contain both theoretical and programming components in order to train students to gain hands-on-experience.

CS 723. Introduction to Bioinformatics. 3 Credits.

This course introduces the fundamental knowledge in bioinformatics and the current advances in selected directions. The topics include: fundamental concepts and experimental techniques in molecular biology, computational methods in genomic sequence comparison and analysis, and computational methods in molecular structural modeling.

CS 724. High Performance Computing with GPU for Large Scale Simulation. 3 Credits.

This course introduces parallel programming principles and has emphasis on hands-on programming and deploying high-performance computing applications for different science and engineering disciplines. Topics includes programming on NVIDIA GPU, efficient GPU accelerated implementation of: (a) computation intensive kernels (b) few sample large scale financial and molecular dynamics simulations, and (c) large scale data analytics and mining.

CS 725. Information Visualization. 3 Credits.

This course covers the theory and application of information visualization. Research on graph design, visual perception, cognition, and interaction will be covered. Research and practical techniques for the display of graphs, networks, hierarchies, text, and complex multivariate data will be addressed. Course projects will require the development of interactive web-based visualizations.

CS 726. Application of Graphs in Bioinformatics. 3 Credits.

This course links the fundamental concepts and algorithms of graphs with the actual biological problems. Various biological problems will be selected to discuss the formulation of the graph, the graph algorithms, and the performance analysis.

CS 734. Introduction to Information Retrieval. 3 Credits.

Laboratory work required. Theory and engineering of information retrieval in the context of developing web-based search engines. Topics include issues related to crawling, ranking, query processing, retrieval models, evaluation, clustering, machine learning, and other aspects related to building web search engines. Students will perform a mix of hands-on development and coding, as well as theoretical exploration of the research literature.

CS 744. Performance Evaluation of Computer Systems and Networks. 3 Credits.

Lecture 3 hours; 3 credits. The course will introduce some of the commonly used techniques in the performance evaluation of computing systems. Students will be exposed to a variety of analytical and simulation tools used in this field. The applicability of the techniques will be illustrated through case studies.

CS 751. Introduction to Digital Libraries. 3 Credits.

Lecture 3 hours; 3 credits. Digital Libraries (DLs) are an increasingly popular research area that encompass more than traditional information retrieval or database methods and techniques. The course will cover a brief history of DL development, with emphasis on World Wide Web implementations. Case studies will be performed on various DLs. The class will focus heavily on project work. At the end of the course, students will be prepared to develop, evaluate, or apply digital library technologies in their work environment. Topics include: Repositories; Distributed Searching; Metadata Harvesting; Preservation, Reference Linking and Citation Analysis.

CS 752. Wireless Communications and Mobile Computing. 3 Credits.

Lecture 3 hours; 3 credits. This course looks at fundamental issues in the area of wireless networks and mobile computing. The course material is organized around the following broad themes: Basics of mobile and wireless communications; Cellular communications: Bandwidth allocation and reservation, Location management, Call admission strategies and QoS issues: Mobile IP and Mobile TCP; Mobile Ad-Hoc NETWORKS (MANET): Routing, Multimedia and QoS support; Sensor networks.

CS 771. Advanced Operating Systems. 3 Credits.

Lecture 3 hours; 3 credits. This course covers principles, design decisions, design techniques, policies, and mechanisms in the design and implementation of general-purpose multiprogramming and distributed operating systems. Topics to be covered include: concurrency, interprocess communication, threads, access control, protection and authentication, multiprocessor operating systems.

CS 772. Network Security: Concepts, Protocols and Programming. 3 Credits.

Lecture 3 hours; 3 credits. This course deals with the basic protocols, techniques and programming issues to secure internet applications and traffic. Topics include: Cryptographic algorithms tools and concepts; Secure Socket Layer (SSL), Transport Layer Security (TLS) and IPsec protocols; Securing Internet Applications: HTTP, SMTP, UDP and multicast; Hands on socket programming using C and Java.

CS 773. Data Mining and Security. 3 Credits.

Introduction to data mining; Algorithms including naive Bayes, Decision Trees and Rules, Association Rules, Linear classification, and Clustering; Cross validation, Lift charts, ROC Curves; SVM, Bayesian networks, K-means clustering; Data transformation; PCA; Ensemble Learning; Application of data mining to security and privacy including authentication, authorization, and intrusion detection; Privacy-preserving data mining. Prerequisite: CS 471 and CS 455 or CS 555.

CS 775. Distributed Systems. 3 Credits.

Lecture 3 hours; 3 credits. This course deals with the design issues in distributed computing systems and will discuss the motivation for building distributed systems, various algorithms and protocols proposed in literature for system operability, and some of the experimental distributed systems that have been built in the last few years. Special attention will be paid to the fault-tolerant and performance aspects of these systems. The project component of this course will enable students to get hands-on experience of implementing some of the distributed algorithms.

CS 778. Networked Multimedia Systems. 3 Credits.

Lecture 3 hours; 3 credits. This course will introduce some of the technical foundations for capturing, transmitting, presentation and storage of continuous multimedia. Students will explore the applications of multimedia and techniques in some areas such as group collaboration and network based education. Topics covered include: Architectures and issues for distributed Multimedia Systems Support for real-time multimedia applications, quality-of-service, synchronization, and presentation of multiple multimedia streams.

CS 779. Design of Network Protocols. 3 Credits.

Lecture 3 hours; 3 credits. Understanding the design, implementation and performance of network protocols using TCP/IP protocol suite as a case study. The students will have hands-on experience on low-level tools and will access and study the source code of these protocols and writing networking software applications. Topics include: socket interface, IPv4 and IPv6, routing, UDP, multicasting and IGMP, TCP specification, implementation and performance.

CS 791. Graduate Seminar. 1-3 Credits.

1-3 credits. Prerequisite: permission of the instructor.

CS 795. Topics in Computer Science. 1-3 Credits.

Topics in computer science.

CS 796. Topics in Computer Science. 1-3 Credits.

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CS 891. Graduate Seminar. 1-3 Credits.

1-3 credits. Prerequisite: permission of the instructor.

CS 895. Topics in Computer Science. 1-3 Credits.

Topics in computer science.

CS 896. Topics in Computer Science. 1-3 Credits.

1-3 credits. Prerequisite: permission of the instructor.

CS 899. Doctoral Dissertation. 1-9 Credits.

1-9 credits. Departmental permission required.

CS 999. Computer Science 999. 1 Credit.

1 credit. A one-hour pass/fail registration required of all graduate students to maintain active status during the final semester prior to graduation. After successfully passing the candidacy examination, all doctoral students are required to be registered for at least one graduate credit each term until the degree is complete.

CSD - Communication Sciences and Disorders

COMMUNICATION SCIENCES AND DISORDERS Courses

CSD 548. Speech-Language and Hearing Programs in the Public Schools. 3 Credits.

The emphasis of this course is on the organization and administration of public school speech-language and hearing programs, as well as clinical, professional and legal issues related to service delivery. Prerequisites: CSD 550 and CSD 560.

CSD 550. Survey of Communication Disorders. 3 Credits.

This course is designed to acquaint the student with recognition, identification, and understanding of speech and language disorders. Prerequisites: permission of the instructor.

CSD 551. Articulation and Phonological Disorders. 3 Credits.

This course emphasizes causes, identification and treatment of articulation and phonological disorders. Prerequisites: CSD 352 and CSD 450/550.

CSD 552. Voice Disorders. 3 Credits.

This course focuses upon anatomical and physiological bases, etiologies, assessment and treatment of voice disorders.

CSD 553. Language Development. 3 Credits.

This course emphasizes language development from the perspective of the speech-language pathologist.

CSD 554. Clinical Practica in Speech Pathology/Audiology I-II-III. 4 Credits.

These practica are designed to provide students with experiences in the evaluation and treatment of communication disorders. (qualifies as a CAP experience) Prerequisites: CSD 351, CSD 449W or CDSE 597, CSD 450 or CSD 550, CSD 451 or CSD 551, CSD 453 or CSD 553, CSD 460 or CSD 560, and permission of program faculty.

CSD 558. Speech and Hearing Science. 3 Credits.

The content of this course focuses upon basic acoustics, speech acoustics, psychoacoustics, speech perception, and clinical laboratory instrumentation. The course is designed to provide fundamental information regarding normal and abnormal aspects of speech and hearing processes. Prerequisites: Grade of C- or better in CSD 460 or CSD 560.

CSD 559. Augmentative and Alternative Communication Methods and Materials. 3 Credits.

This course focuses upon current augmentative and alternative communication methods, equipment, and materials that are utilized in the management of severe communication disorders.

CSD 560. Hearing Disorders and Basic Audiometry. 3 Credits.

A study of the physics of sound, anatomy, and physiology of the human ear, basic audiometry and hearing disorders.

CSD 561. Aural Rehabilitation I. 3 Credits.

A study of audiological findings and the implications for hearing therapy; speech and language development of the deaf.

CSD 565. Signing I-Beginning Nonverbal Communication. 3 Credits.

Study of the grammatical structure and use of American sign language; exposure to ideals and culture of the deaf community. (This course does not satisfy the general education foreign language skills requirement.) Prerequisites: permission of the instructor.

CSD 649. Clinical Procedures in Speech-Language Pathology. 3 Credits.

This course teaches students basic clinical procedures and competencies in speech-language pathology with an emphasis on language sampling and identification of grammatical categories, skills required by professionals practicing in the field of speech-language pathology. Prerequisites: Permission of instructor.

CSD 650. Organic Speech-Language Disorders. 3 Credits.

Lecture 3 hours; 3 credits. The content of this course focuses upon the structural and neurological bases of speech and language disorders, particularly those related to laryngeal and central nervous system pathologies.

CSD 651. Language Development and Language Disorders. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: CSD 553 or equivalent, or permission of the instructor. This course provides a detailed analysis of current literature pertinent to language development, diagnosis and intervention.

CSD 652. Articulation and Phonological Disorders. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: CSD 551. The principal emphasis of this course is clinical intervention for phonological and articulation disorders including motor speech disorders.

CSD 653. Language Diagnosis and Remediation. 3 Credits.

This is an advanced course on the diagnostic methods and remediation techniques for the child with language disorder and the child who is nonverbal. Prerequisites: Permission of instructor.

CSD 654. Advanced Clinical Techniques in Speech Pathology. 3 Credits.

Lecture 3 hours; 3 credits. This course emphasizes current techniques in the management of voice, language, stuttering and articulation disorders.

CSD 655. Cleft Palate. 3 Credits.

Lecture 3 hours; 3 credits. The purpose of this course is to investigate the etiologies, communicative disorders, diagnostic methods, and therapeutic techniques related to cleft palate and related disorders.

CSD 656. Theories and Therapies in Stuttering. 3 Credits.

Lecture 3 hours; 3 credits. This course emphasizes current etiological theories, research, diagnostic procedures and therapeutic techniques related to stuttering.

CSD 657. Aphasia and Related Cognitive Disorders. 3 Credits.

The objective of this course is to investigate the etiologies, communicative disorders, diagnostic methods and therapeutic techniques related to aphasia, dementia, and traumatic brain injury.

CSD 658. Swallowing Disorders. 3 Credits.

Lecture 3 hours; 3 credits. This course reviews the structures and neural bases of swallowing, common etiologies that cause dysphagia, and clinical techniques used in assessment and management of swallowing disorders in pediatric and adult populations.

CSD 660. Procedures in Audiology. 3 Credits.

Advanced study of the physics of sound, anatomy, and physiology of audition, hearing disorders, and audiometric procedures, providing knowledge and skills necessary for a speech-language pathologist.

DANC - Dance

DANCE Courses

DANC 595. Topics in Dance. 1-3 Credits.

The advanced study of selected topics designed to permit small groups of qualified students to work on subjects of mutual interest which, due to their specialized nature, may not be offered regularly. These courses appear in the course schedule, and are more fully described in a booklet distributed to academic advisors. Prerequisites: Appropriate survey course or permission of the instructor.

DANC 596. Topics in Dance. 1-3 Credits.

The advanced study of selected topics designed to permit small groups of qualified students to work on subjects of mutual interest which, due to their specialized nature, may not be offered regularly. These courses appear in the course schedule, and are more fully described in a booklet distributed to all academic advisors. Prerequisites: Appropriate survey course or permission of the instructor.

DANC 597. Tutorial Work in Special Topics in Dance. 1-3 Credits.

Independent reading and study on a topic to be selected under the direction of an instructor. Conferences and papers as appropriate. Prerequisites: graduate standing and approval of the department chair.

DANC 598. Tutorial Work in Special Topics in Dance. 1-3 Credits.

Independent reading and study on a topic to be selected under the direction of an instructor. Conferences and papers as appropriate. Prerequisites: graduate standing and approval of the department chair.

DANC 697. Tutorial Work in Special Topics in Dance. 1-3 Credits.

Independent reading and study on a topic to be selected under the direction of an instructor. Conferences and papers as appropriate. Prerequisites: Graduate standing and approval of the department chair.

DANC 698. Tutorial Work in Special Topics in Dance. 1-3 Credits.

Independent reading and study on a topic to be selected under the direction of an instructor. Conferences and papers as appropriate. Prerequisites: Graduate standing and approval of the department chair.

DNTH - Dental Hygiene

DENTAL HYGIENE Courses

DNTH 512. Perspectives on Dental Hygiene Practice. 3 Credits.

Course is designed for the licensed dental hygienist who seeks to maintain an awareness of changing trends, perspectives, evidence-based interventions and technologies in dental hygiene, health, and society that influence the dental hygiene process of care. (Offered summer.) Qualifies as a CAP experience. Prerequisites: permission of the instructor.

DNTH 514. Educational Concepts for the Health Professional I. 3 Credits.

This course is designed to explore various educational concepts, principles and methods of teaching for adults. Students will learn to present educational information to a diverse client population, in a variety of settings, in an ethical and professional manner. Topics include, but are not limited to, objectives, planning, implementation and evaluation of instruction; instructional strategies; delivery models; presentation skills; and techniques for communicating health information. Prerequisites: permission of the instructor.

DNTH 515. Research Methods in the Health Sciences. 3 Credits.

Designed to develop skills in scientific methods, evidence based decision making, levels of evidence, and critical analysis of research findings. Emphasis on types of research, problem selection and hypothesis writing, research planning and design, data collection and measuring techniques, analysis and interpretation of data, research proposal writing and computer application. A written research proposal is required for graduate credit. (offered fall).

DNTH 516. Administrative Leadership and Professional Development. 3 Credits.

A study of current trends that influence the profession of dental hygiene including oral health care delivery, manpower, financing mechanisms, quality improvement, third party payers, professional associations, regulatory agencies and legislation. Emphasis is on ethical, political, and legal issues as they relate to the dental hygiene profession. (offered spring) Prerequisites: permission of the instructor.

DNTH 540. Telehealthcare Technology. 3 Credits.

This course will examine the concept, global impact, and trends in telehealthcare technology on the client/patient, multidisciplinary practitioners, and various healthcare systems. Emphasis is on effective evidence-based decision making to reduce errors in patient care, promote care in remote or underserved geographical areas, and the ability to retrieve and evaluate healthcare information that improves access to quality, cost effective health care. (Offered spring, summer) Prerequisites: permission of the instructor.

DNTH 597. Independent Study in Dental Hygiene. 1-6 Credits.

Independent reading and study on a topic selected under direction of a faculty member. (Offered fall, spring, summer) Prerequisites: permission of instructor.

DNTH 604. Clinical Administration and Teaching. 4 Credits.

Application of principles and theories of education and management to dental hygiene clinical education. Emphasis is on planning, implementing and evaluating clinical teaching; assessment of clinical competence; management of human and physical resources; and regulations affecting clinical education. (offered fall).

DNTH 611. Modeling and Simulation Applications in Healthcare. 3 Credits.

This course examines the principles and innovative applications for modeling and simulation in healthcare practice, research, education, and administration with emphasis on emerging issues and trends in technology. Topics include the selection and implementation of simulation technology in conceptual epidemiology public and environmental health, dental hygiene, dentistry, nursing, medicine, laboratory sciences, healthcare management and health information.

DNTH 650. Advanced International Dental Hygiene. 3-9 Credits.

Faculty-led experiences offer unique opportunities for students to travel abroad, develop cross cultural competence, experience global health challenges, and engage in projects that advance oral health worldwide. Prerequisites: DNTH 514.

DNTH 660. Educational Concepts for the Health Professional II. 3 Credits.

Explores instructional strategies and their application to contemporary health professional roles. Emphasis is on individuals as health care specialists in business and industry; professional, private and public organizations; higher education; and the health care industry. Topics include implementation and evaluation of instruction, roles and responsibilities of faculty within an accredited program affected by state and national standards, and ethical and career related issues and trends. Students are provided with practical experience in traditional and distance education instructional methods. (offered spring) Prerequisites: DNTH 514 or permission of the instructor.

DNTH 663. Interprofessional Health Promotion. 3 Credits.

Course brings together students from various health disciplines to learn each other's roles and collaborate as a team using technology to promote health and prevent disease. Focus will be on optimizing health efforts and outcomes through an interprofessional approach that is guided by the research evidence and current technologies. Topics include Healthy People 2020 objectives, age, specific clinical guidelines for health promotion and illness prevention, theories on behavior and motivation, sociocultural issues, telehealth care, and various health problems. Evidence-based measures used by the team for promoting and maintaining health throughout the lifespan are emphasized.

DNTH 668. Internship. 3-9 Credits.

Experience-based learning activities designed to develop a role of competence related to the individual's area of specialization while working under the supervision of a faculty member or host supervisor within an educational, health care, research, or corporate health setting. A clinical dental hygiene internship is prerequisite to DNTH 669. Available for pass/fail grade only. (offered fall, spring, summer) Prerequisites: DNTH 514, DNTH 515, DNTH 604 or permission of the instructor.

DNTH 695. Topics in Dental Hygiene. 1-6 Credits.

Advanced seminars on selected topics in dental hygiene. Topics vary by semester. offered fall, spring, summer).

DNTH 697. Independent Study-Dental Hygiene. 1-6 Credits.

Independent reading and study on a topic selected under direction of a faculty member. (offered fall, spring, summer).

DNTH 698. Research. 1,3 Credit.

An original thesis research project is executed with the major advisor and thesis committee guiding the student's research project under supervision. A written research proposal must be submitted and approved prior to beginning the project. Required for students in the thesis option. Available as pass/fail grade only. (offered fall, spring, summer) Prerequisites: DNTH 515, FOUN 722 or MPHO 612.

DNTH 699. Thesis. 3 Credits.

Devoted to research, writing of the thesis, and scheduled conferences with the candidate's advisor and thesis committee. Students must submit an acceptable written thesis demonstrating knowledge of problem selection, data classification, analysis and interpretation and defend it. Available as pass/fail grade only. (offered fall, spring) Prerequisites: DNTH 698.

ECE - Electrical and Computer Engineering

ELECTRICAL AND COMPUTER ENGINEERING Courses

ECE 503. Power Electronics. 3 Credits.

Power electronics provides the needed interface between an electrical source and an electrical load and facilitates the transfer of power from a source to a load by converting voltages and currents from one form to another. Topics include: alternating voltage rectification, Pulse Width Modulation (PWM), DC converters (Buck, Boost, Buck-Boost, Cuk and SEPIC converters), negative feedback control in power electronics, isolated switching mode power supply, flyback and forward power supply, solid state power switches, AC inverter. Prerequisites: MATH 307 and ECE 303.

ECE 504. Electric Drives. 3 Credits.

Electric drives efficiently control the torque, speed and position of electric motors. This course has a multi-disciplinary nature and includes fields such as electric machine theory, power electronics, and control theory. Topics include: switch-mode power electronics, magnetic circuit, DC motor, AC motor, Brushless DC motor, induction motor, speed control of induction motor, vector control of induction motor, stepper-motor. Prerequisites: ECE 201 and ECE 303.

ECE 506. Introduction to Visualization. 3 Credits.

The course provides a practical treatment of computer graphics and visualization with emphasis on modeling and simulation applications. It covers computer graphics fundamentals, visualization principles, and software architecture for visualization in modeling and simulation. (cross listed with MSIM 441/541) Prerequisites: a grade of C or better in CS 250.

ECE 507. Introduction to Game Development. 3 Credits.

An introductory course focused on game development theory and modern practices with emphasis on educational game development. Topics covered include game architecture, computer graphics theory, user interaction, audio, high level shading language, animation, physics, and artificial intelligence. Students will develop games related to science, technology, engineering, and mathematics (STEM) education. The developed games can run on a variety of computer, mobile, and gaming platforms. (cross listed with MSIM 408/508) Prerequisites: CS 361 or equivalent.

ECE 510. Model Engineering. 3 Credits.

The goal of this course is to develop understanding of the various modeling paradigms appropriate for capturing system behavior and conducting digital computer simulation of many types of systems. The techniques and concepts discussed typically include UML, concept graphs, Bayesian nets, Markov models, Petri nets, system dynamics, Bond graphs, etc. Students will report on a particular technique and team to implement a chosen system model. (cross-listed with MSIM 510).

ECE 541. Advanced Digital Design and Field Programmable Gate Arrays. 3 Credits.

Course will provide a description of FPGA technologies and the methods using CAD design tools for implementation of digital systems using FPGAs. It provides advanced methods of digital circuit design, specification, synthesis, implementation and prototyping. It introduces practical system design examples. (Offered spring) Prerequisites: ECE 341.

ECE 543. Computer Architecture. 3 Credits.

An introduction to computer architectures. Analysis and design of computer subsystems including central processing units, memories and input/output subsystems. Important concepts include datapaths, computer arithmetic, instruction cycles, pipelining, virtual and cache memories, direct memory access and controller design. (offered fall) Prerequisites: ECE 341 and ECE 346.

ECE 551. Communication Systems. 3 Credits.

Fundamentals of communication systems engineering. Modulation methods including continuous waveform modulation (amplitude, angle). Design of modulation systems and the performance in the presence of noise. Communication simulation exercises through computer experiments. Prerequisites: ECE 304 and ECE 302.

ECE 552. Introduction to Wireless Communication Networks. 3 Credits.

Introduction to current wireless network technologies and standards. The radio spectrum and radio wave propagation models (pathloss, fading, and multipath). Modulation, diversity, and multiple access techniques. Wireless network planning and operation. Current and emerging wireless technologies (satellite systems, vehicular/sensor networks). Prerequisites: ECE 304 and ECE 302.

ECE 554. Introduction to Bioelectrics. 3 Credits.

Covers the electrical properties of cells and tissues as well as the use of electrical and magnetic signals and stimuli in the diagnosis and treatment of disease. Typical topics to be covered include basic cell physiology, endogenous electric fields in the body, electrocardiography, cardiac pacing, defibrillation, electrotherapy, electroporation, electrotherapy in wound healing. In addition, ultrashort electrical pulses for intracellular manipulation and the application of plasmas to biological systems will be covered. Prerequisites: PHYS 111N or higher; MATH 200 or higher.

ECE 555. Network Engineering and Design. 3 Credits.

Prerequisites: ECE 355 or permission of the instructor. Emphasis is on gaining an understanding of networking design principles that entails all aspects of the network development life cycle. Topics include campus LAN models and design, VLANs, internetworking principles and design, WAN design, design of hybrid IP networks, differentiated vs. integrated services, traffic flow measurement and management. (offered spring).

ECE 558. Instrumentation. 3 Credits.

Computer interfacing using a graphical programming language with applications involving digital-to-analog conversion (DAC), analog-to-digital conversion (ADC), digital input output (DIO), serial ports, and the general-purpose instrument bus (GPIB). Analysis of sampled data involving use of probability density function, mean and standard deviations, correlations, and the power spectrum. Students are required to do a semester-long project on LabVIEW implementation. (offered spring, summer) Prerequisites: PHYS 102N, PHYS 112N or PHYS 232N and ECE 302.

ECE 561. Automatic Control Systems. 3 Credits.

Analysis and design of control systems via frequency and time domain techniques. Root locus, Bode and Nyquist techniques. Stability, sensitivity, and performance specifications. Cascade and feedback compensation. Computer-aided analysis and design. Pole placement through state variable feedback. Prerequisites: ECE 302.

ECE 562. Introduction to Medical Image Analysis (MIA). 3 Credits.

Introduction to basic concepts in medical image analysis. Medical image registration, segmentation, feature extraction, and classification are discussed. Basic psychophysics, fundamental ROC analysis and FROC methodologies are covered. Prerequisites: a grade of C or better in MATH 212.

ECE 564. Biomedical Applications of Low Temperature Plasmas. 3 Credits.

This course is cross listed between ECE and Biology. It is designed to be taken by senior undergraduate students and first year graduate students. The course contents are multidisciplinary, combining materials from engineering and the biological sciences. The course covers an introduction to the fundamentals of non-equilibrium plasmas, low temperature plasma sources, and cell biology. This is followed by a detailed discussion of the interaction of low temperature plasma with biological cells, both prokaryotes and eukaryotes. Potential applications in medicine such as wound healing, blood coagulation, sterilization, and the killing of various types of cancer cells will be covered. Prerequisites: Senior standing.

ECE 571. Introduction to Solar Cells. 3 Credits.

This course is designed to provide the fundamental physics and characteristics of photovoltaic materials and devices. A focus is placed on i) optical interaction, absorption, and design for photovoltaic materials and systems, ii) subsequent energy conversion processes in inorganic/organic semiconductor such as generation, recombination, and charge transport, and iii) photovoltaic testing and measurement techniques to characterize solar cells including contact and series resistance, open circuit voltage, short circuit current density, fill factor, and energy conversion efficiency of photovoltaic devices. (Offered fall, spring) Prerequisites: ECE 332.

ECE 572. Plasma Processing at the Nanoscale. 3 Credits.

The science and design of partially ionized plasma and plasma processing devices used in applications such as etching and deposition at the nanoscale. Gas phase collisions, transport parameters, DC and RF glow discharges, the plasma sheath, sputtering, etching, and plasma deposition. Prerequisites: ECE 323.

ECE 573. Solid State Electronics. 3 Credits.

The objective of this course is to understand basic semiconductor devices by understanding semiconductor physics (energy bands, carrier statistics, recombination and carrier drift and diffusion) and to gain an advanced understanding of the physics and fundamental operation of advanced semiconductor devices. Following the initial introductory chapters on semiconductor physics, this course will focus on p-n junctions, metal-semiconductor devices, MOS capacitors, MOS field effect transistors (MOSFET) and bipolar junction transistors. Prerequisites: ECE 313, ECE 323 and ECE 332.

ECE 574. Optical Fiber Communications. 3 Credits.

Electromagnetic waves; optical sources including laser diodes; optical amplifiers; modulators; optical fibers; attenuation and dispersion in optical fibers; photodetectors; optical receivers; noise considerations in optical receivers; optical communication systems. Prerequisites: ECE 323 and MATH 312.

ECE 578. Introduction to Lasers and Laser Applications. 3 Credits.

Introduction and review of electromagnetic theory; atomic physics and interactions of radiation with matter; two- and three-level systems, and rate equations; gain; single- vs. multimode; homogeneous and inhomogeneous broadening; Q-switching and mode-locking; semiconductor lasers; vertical cavity surface emitting lasers (VCSELs); Raman spectroscopy, remote sensing and ranging; holography; and laser ablation. Prerequisites: ECE 323 and MATH 312.

ECE 583. Embedded Systems. 3 Credits.

This course covers fundamentals of embedded systems: basic architecture, programming, and design. Topics include processors and hardware for embedded systems, embedded programming and real time operating systems. Pre- or corequisite: ECE 346.

ECE 595. Topics in Electrical and Computer Engineering. 1-3 Credits.

Topics in Electrical and Computer Engineering Prerequisites: departmental approval.

ECE 596. Topics in Electrical and Computer Engineering. 1-3 Credits.

Topics in Electrical and Computer Engineering Prerequisites: departmental approval.

ECE 601. Linear Systems. 3 Credits.

A comprehensive introduction to the analysis of linear dynamical systems from an input-output and state space point of view. Concepts from linear algebra, numerical linear algebra and linear operator theory are used throughout. Some elements of state feedback design and state estimation are also covered. Prerequisites: MATH 307.

ECE 607. Machine Learning I. 3 Credits.

Course provides a practical treatment of design, analysis, implementation and applications of algorithms. Topics include multiple machine learning models: linear models, neural networks, support vector machines, instance-based learning, Bayesian learning, genetic algorithms, ensemble learning, reinforcement learning, unsupervised learning, etc. Prerequisites: Graduate standing.

ECE 611. Numerical Methods in Engineering Analysis. 3 Credits.

Course intended to provide graduate students in Electrical and Computer Engineering with a basic knowledge of numerical methods in the areas of Physical Electronics and Systems Engineering. Topics will include: Discretization and truncation errors, Numerical integration, Solution of non-linear equations, Matrix methods, Ordinary and partial differential equations, Finite difference methods, Numerical stability, Simulation for stochastic processes, and other aspects of special interest to graduate students in the class. Prerequisites: Graduate standing or advisor's permission (for BS/MS students).

ECE 612. Digital Signal Processing I. 3 Credits.

Prerequisites: ECE 381 or equivalent. This course will present the fundamentals of discrete-time signal processing. Topics will include time domain signals and discrete-time linear systems, continuous-time signal sampling and reconstructions, the Discrete Fourier Transform (DFT), the Z-transform, FIR and IIR digital filter design, and digital filter implementations. Applications and examples of DSP usage will be discussed. Problem solving using MATLAB is required.

ECE 623. Electromagnetism. 3 Credits.

Review of electrostatic and magnetostatic concepts, time varying field, Maxwell's equations, plane wave propagation in various media, transmission lines, optical wave guides, resonant cavities, simple radiation systems, and their engineering applications. Prerequisites: ECE 323 or equivalent.

ECE 642. Computer Networking. 3 Credits.

The course is based on the ISO (International Standard Organization) OSI (Open Systems Interconnection) reference model for computer networks. A focus is placed on the analysis of protocols at different layers, network architectures, and networking systems performance analysis. Current topic areas include LANs, MANs, TCP/IP networks, mobile communications, and ATM. Prerequisites: ECE 455 or ECE 555 or permission of the instructor.

ECE 643. Computer Architecture Design. 3 Credits.

Digital computer design principles. The course focuses on design of state-of-the-art computing systems. An emphasis is placed on superscalar architectures focusing on the pipelining and out-of-order instruction execution operations. Prerequisites: ECE 443 or ECE 543.

ECE 648. Advanced Digital Design. 3 Credits.

This course introduces methods for using high level hardware description language such as VHDL and/or Verilog for the design of digital architecture. Topics include top-down design approaches, virtual prototyping, design abstractions, hardware modeling techniques, algorithmic and register level design, synthesis methods, and application decomposition issues. Final design project is required. Prerequisites: ECE 341.

ECE 651. Statistical Analysis and Simulation. 3 Credits.

An introduction to probabilistic and statistical techniques for analysis of signals and systems. This includes a review of probability spaces, random variables, and random processes. Analysis and simulation of systems with random parameters and stochastic inputs are considered. Prerequisites: MATH 307 and one undergraduate course in probability or statistics.

ECE 652. Wireless Communications Networks. 3 Credits.

Prerequisites: ECE 451 or ECE 551 or permission of instructor. Fundamental concepts in wireless communication systems and networks: radio waveform propagation modeling (free-space, reflections and multipath, fading, diffraction and Doppler effects); physical and statistical models for wireless channels; modulation schemes for wireless communications and bandwidth considerations; diversity techniques; MIMO systems and space-time coding; multiuser systems and multiple access techniques (TDMA, FDMA, CDMA); spread spectrum and multiuser detection; introduction to wireless networking and wireless standards; current and emerging wireless technologies.

ECE 667. Cooperative Education. 1-3 Credits.

Student participation for credit based on academic relevance of the work experience, criteria, and evaluative procedures as formally determined by the department and the Cooperative Education/Career Management program prior to the semester in which the work experience is to take place.

ECE 668. Internship. 1-3 Credits.

Academic requirements will be established by the department and will vary with the amount of credit desired. Allows students an opportunity to gain short duration career related experience. Meant to be used for one-time experience. Work may or may not be paid. Project is completed during the term. Prerequisites: approval by department and Career Management.

ECE 669. Practicum. 1-3 Credits.

Academic requirements will be established by the department and will vary with the amount of credit desired. Allows students an opportunity to gain short duration career related experience. Student is usually already employed - this is an additional project in the organization. Prerequisites: approval by department and Career Management.

ECE 695. Topics in Electrical or Computer Engineering. 3 Credits.

This course will be offered as needed, depending upon the need to introduce special subjects to target specific areas of master's-level specializations in electrical or computer engineering.

ECE 698. Master's Project. 1-3 Credits.

Individual project directed by the student's professor in major area of study.

ECE 699. Thesis. 1-9 Credits.

Prerequisites: departmental approval. Directed research for the master's thesis.

ECE 731. Graduate Seminar. 1 Credit.

Graduate seminar presentations concerning technical topics of current interest given by faculty and invited speakers. Prerequisites: graduate standing.

ECE 742. Computer Communication Networks. 3 Credits.

This is an advanced level course in data communications. A focus is placed on the analysis, modeling, and control of computer communication systems. Topics include packet switched networks, circuit switched networks, ATM networks, network programming, network control and performance analysis, network security, and wireless sensor networks. Prerequisites: ECE 642 or permission of instructor.

ECE 751. Biostatistics: Fundamentals and Applications. 3 Credits.

Descriptive statistics, probability distributions and computations, estimation, hypothesis testing (one- and two-sample inferences), regression methods (simple and multiple), methods for analyzing categorical data (Fisher's exact test, McNemar's test, chi-square tests, Cochran-Mantel-Haenszel methods), analysis of variance including non-parametric alternatives, multi-sample inference. Appropriate examples will be given from health sciences and biomedical engineering. Prerequisites: ECE 304 or equivalent.

ECE 762. Digital Control Systems. 3 Credits.

Mathematical representation, analysis, and design of discrete-time and sampled-data control systems. Topics include transfer function and state space representations, stability, the root locus method, frequency response methods, and state feedback. Prerequisites: ECE 381, ECE 461 or ECE 561, and ECE 601 or permission of instructor.

ECE 763. Multivariable Control Systems. 3 Credits.

A comprehensive introduction to techniques applicable in control of complex systems with multiple inputs and outputs. Both the frequency domain and state variable approaches are utilized. Special topics include robust and optimal control. Prerequisites: ECE 461 or ECE 561 and ECE 601 or permission of instructor.

ECE 766. Nonlinear Control Systems. 3 Credits.

An introduction to mathematical representation, analysis, and design of nonlinear control systems. Topics include phase-plane analysis, Lyapunov stability theory for autonomous and nonautonomous systems, formal power series methods and differential geometric design techniques. Prerequisites: ECE 461 or ECE 561 and ECE 601 or permission of instructor.

ECE 771. Analog VLSI. 3 Credits.

A survey of some fundamental topics in analog VLSI including current mirrors, amplifiers, frequency response, noise, feedback, stability, and operational amplifiers. Projects on design of CMOS operational amplifiers including the use of Cadence design tools for simulation and layout. Students are expected to have some knowledge or experience with analog electronics. Prerequisites: ECE 313.

ECE 772. Fundamentals of Solar Cells. 3 Credits.

The course provides an overview of the fundamentals of solar cell technologies, design, and operation. The course is designed for graduate students in Engineering and Science interested in the field of alternative energy. The course objectives are to make sure each student: understands the various forms of alternative energies, understands solar cell design, understands solar cell operation, and acquires knowledge of the various solar cells technologies. The topics to be covered include: Alternative energies; Worldwide status of Photovoltaics; Solar irradiance; Review of semiconductor properties; Generation, recombination; Basic equations of device physics; p-n junction diodes; Ideal solar cells; Efficiency limits; Efficiency losses and measurements; Module fabrication; c-Si technology; classical; Photovoltaic systems; Design of stand-alone system; Residential PV systems. Prerequisites: Graduate standing in Engineering and Science.

ECE 773. Introduction to Nanotechnologies. 3 Credits.

This course will introduce the rapidly emerging field of nanotechnology with special focus on underlying principles and applications relevant to the nanoscale dimensions. Specifically, this course will cover (1) the basic principles related to synthesis and fabrication of nanomaterials and nanostructures, (2) zero-, one-, two- and three-dimensional nanostructures, (3) characterization and properties of nanomaterials, and (4) application of nanoscale devices. Prerequisites: graduate standing in Engineering and Science.

ECE 774. Semiconductor Characterization. 3 Credits.

Introduction of basic methods for semiconductor material and device characterization. Topics include resistivity, carrier doping concentration, contact resistance, Schottky barrier height, series resistance, channel length, threshold voltage, mobility, oxide and interface trapped charge, deep level impurities, carrier lifetime, and optical, chemical and physical characterization. Prerequisites: ECE 473 or ECE 573 or equivalent.

ECE 775. Non-thermal Plasma Engineering. 3 Credits.

This course covers the fundamental principals governing low temperature plasma discharges and their applications. First the fundamental properties of plasmas are introduced. These include the kinetic theory of gases, collisional processes, and plasma sheaths. Then in-depth coverage of the physical mechanisms underlying the operation of non-equilibrium plasma discharges is presented, including important characteristics such as their ignition, evolution, and eventual quenching. Finally, practical applications of non-thermal plasmas, including applications in biology and medicine, are presented. Prerequisite: graduate standing.

ECE 777. Semiconductor Process Technology. 3 Credits.

Theory, design and fabrication of modern integrated circuits that consist of nano scale devices and materials. Topics include crystal growth and wafer preparation process including epitaxy, thin film deposition, oxidation, diffusion, ion implantation, lithography, dry etching, VLSI process integration, diagnostic assembly and packaging, yield and reliability. Prerequisites: ECE 473 or ECE 573.

ECE 780. Machine Learning II. 3 Credits.

Advanced topics in machine learning and pattern recognition systems. Data reduction techniques including principle component analysis, independent component analysis and manifold learning. Introduction to sparse coding and deep learning for data representation and feature extraction. Prerequisite: ECE 607 or equivalent.

ECE 782. Digital Signal Processing II. 3 Credits.

Prerequisites: ECE 612 or equivalent. Review of time domain and frequency domain analysis of discrete time signals and systems. Fast Fourier Transforms, recursive and non-recursive digital filter analysis and design, multirate signal processing, optimal linear filters, and power spectral estimation.

ECE 783. Digital Image Processing. 3 Credits.

Principles and techniques of two-dimensional processing of images. Concepts of scale and spatial frequency. Image filtering in spatial and transform domains. Applications include image enhancement and restoration, image compressing, and image segmentation for computer vision. Prerequisites: ECE 381 or ECE 612 or ECE 782 or ECE 882. Prerequisites: ECE 381 or ECE 612 or ECE 782 or ECE 882.

ECE 784. Computer Vision. 3 Credits.

Principles and applications of computer vision, advanced image processing techniques as applied to computer vision problems, shape analysis and object recognition. Prerequisite: graduate standing.

ECE 787. Digital Communications. 3 Credits.

Fundamental concepts of digital communication and information transmission: information sources and source coding; orthonormal expansions of signals, basis functions, and signal space concepts; digital modulation techniques including PAM, QAM, PSK and FSK; matched filters, demodulation and optimal detection of symbols and sequences; bandwidth; mathematical modeling of communication channels; channel capacity. Prerequisites: ECE 451/ECE 551 or equivalent or permission of the instructor.

ECE 795. Topics in Electrical and Computer Engineering. 3 Credits.

Topics in Electrical and Computer Engineering Prerequisites: departmental approval.

ECE 796. Topics in Electrical and Computer Engineering. 3 Credits.

Study of selected topics in Electrical and Computer Engineering. Prerequisites: departmental approval.

ECE 797. Independent Study. 3 Credits.

This course allows students to develop specialized expertise by independent study (supervised by a faculty member) Prerequisites: departmental approval.

ECE 831. Graduate Seminar. 1 Credit.

Graduate seminar presentations concerning technical topics of current interest given by faculty and invited speakers.

ECE 842. Computer Communication Networks. 3 Credits.

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A survey of some fundamental topics in analog VLSI including current mirrors, amplifiers, frequency response, noise, feedback, stability, and operational amplifiers. Projects on design of CMOS operational amplifiers including the use of Cadence design tools for simulation and layout. Students are expected to have some knowledge or experience with analog electronics. Prerequisites: ECE 313.

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ECE 873. Introduction to Nanotechnologies. 3 Credits.

This course will introduce the rapidly emerging field of nanotechnology with special focus on underlying principles and applications relevant to the nanoscale dimensions. Specifically, this course will cover (1) the basic principles related to synthesis and fabrication of nanomaterials and nanostructures, (2) zero-, one-, two- and three-dimensional nanostructures, (3) characterization and properties of nanomaterials, and (4) application of nanoscale devices. Prerequisites: graduate standing in Engineering and Science.

ECE 874. Semiconductor Characterization. 3 Credits.

Introduction of basic methods for semiconductor material and device characterization. Topics include resistivity, carrier doping concentration, contact resistance, Schottky barrier height, series resistance, channel length, threshold voltage, mobility, oxide and interface trapped charge, deep level impurities, carrier lifetime, and optical, chemical and physical characterization. Prerequisites: ECE 473 or ECE 573 or equivalent.

ECE 875. Non-thermal Plasma Engineering. 3 Credits.

This course covers the fundamental principals governing low temperature plasma discharges and their applications. First the fundamental properties of plasmas are introduced. These include the kinetic theory of gases, collisional processes, and plasma sheaths. Then in-depth coverage of the physical mechanisms underlying the operation of non-equilibrium plasma discharges in presented, including important characteristics such as their ignition, evolution, and eventual quenching. Finally, practical applications of non-thermal plasmas, including applications in biology and medicine, are presented. Prerequisite: graduate standing.

ECE 877. Semiconductor Process Technology. 3 Credits.

Theory, design and fabrication of modern integrated circuits that consist of nano scale devices and materials. Topics include crystal growth and wafer preparation process including epitaxy, thin film deposition, oxidation, diffusion, ion implantation, lithography, dry etching, VLSI process integration, diagnostic assembly and packaging, yield and reliability. Prerequisites: ECE 473 or ECE 573.

ECE 880. Machine Learning II. 3 Credits.

Advanced topics in machine learning and pattern recognition systems. Data reduction techniques including principle component analysis, independent component analysis and manifold learning. Introduction to sparse coding and deep learning for data representation and feature extraction. Prerequisites: ECE 607 or equivalent.

ECE 882. Digital Signal Processing II. 3 Credits.

Prerequisites: ECE 612 or equivalent. Review of time domain and frequency domain analysis of discrete time signals and systems. Fast Fourier Transforms, recursive and non-recursive digital filter analysis and design, multirate signal processing, optimal linear filters, and power spectral estimation.

ECE 883. Digital Image Processing. 3 Credits.

Principles and techniques of two-dimensional processing of images. Concepts of scale and spatial frequency. Image filtering in spatial and transform domains. Applications include image enhancement and restoration, image compressing, and image segmentation for computer vision. Prerequisites: ECE 381 or ECE 612 or ECE 782 or ECE 882.

ECE 884. Computer Vision. 3 Credits.

Principles and applications of computer vision, advanced image processing techniques as applied to computer vision problems, shape analysis and object recognition. Prerequisite: Graduate standing.

ECE 887. Digital Communications. 3 Credits.

Fundamental concepts of digital communication and information transmission: information sources and source coding; orthonormal expansions of signals, basis functions, and signal space concepts; digital modulation techniques including PAM, QAM, PSK and FSK; matched filters, demodulation and optimal detection of symbols and sequences; bandwidth; mathematical modeling of communication channels; channel capacity. Prerequisites: ECE 451/ECE 551 or equivalent or permission of the instructor.

ECE 895. Topics in Electrical and Computer Engineering. 3 Credits.

Topics in Electrical and Computer Engineering Prerequisites: departmental approval.

ECE 896. Topics in Electrical and Computer Engineering. 3 Credits.

Topics in Electrical and Computer Engineering.

ECE 897. Independent Study. 3 Credits.

This course allows students to develop specialized expertise by independent study (supervised by a faculty member) Prerequisites: departmental approval.

ECE 899. Dissertation Research. 1-9 Credits.

Directed research for the doctoral dissertation. Prerequisites: departmental approval.

ECE 999. Electrical and Computer Engineering 999. 1 Credit.

A one-hour pass/fail registration required of all graduate students to maintain active status during the final semester prior to graduation. After successfully passing the candidacy examination, all doctoral students are required to be registered for at least one graduate credit each term until the degree is complete. (Refer to the policy on Graduate Student Registration Requirement for additional information).

ECON - Economics

ECONOMICS Courses

ECON 502. Transportation Economics. 3 Credits.

A survey of the transportation system in the United States including its development, pricing, and regulation. Special attention is given to railroads, highways, pipeline, water and air transportation; and the roles that these modes of transportation play in economic development.

ECON 507. Labor Market Economics. 3 Credits.

Economic analysis of various facets of labor markets. Emphasis is placed on the analysis of labor supply, labor demand, wage determination, earnings differentials and inequality, occupational choice, human capital investment, labor market discrimination, mobility and immigration, impact of unions, and unemployment.

ECON 513. Econometrics. 3 Credits.**ECON 521. Public Economics. 3 Credits.**

This course examines the interaction between government and the economy, with particular emphasis on the role of the federal government. Topics that address the motivation for government involvement in the economy include market failure, income inequality, and redistribution of income. Specific programs studied include Medicare/Medicaid, welfare programs, and the social security system.

ECON 525. Introduction to Mathematical Economics. 3 Credits.

The course focus is on the use of differential and integral calculus, matrix algebra, difference equations and classical optimization theory in the presentation and development of economic theory.

ECON 527. Industrial Organization and Public Policy. 3 Credits.

A study of market structures and the conduct and performance of business firms in different market structures. The emphasis is on the theory and measurement of industrial concentration and public policy responses to industrial concentration.

ECON 531. Money and Banking. 3 Credits.

Examines the nature and functions of money and credit, the commercial banking system, the Federal Reserve System, the quantity theory of money, the theory of income determination, the balance of payments and exchange rates, and the history of monetary policy in the United States.

ECON 535. Health Economics: A Global Perspective. 3 Credits.

This course introduces the student to the economics of health care and the application of health economics to health care problems, the issues surrounding those problems, and the potential solutions to those problems. The course will emphasize institutional features of the health care industry, the market for health care, the political economy of health care, and government involvement in the delivery of health care. Further, the course will survey the delivery of health care in other countries and provide a global perspective on selected health care issues such as AIDS, water and air quality, and the aging of the population.

ECON 544. Development of the American Economy. 3 Credits.

A study of the economic development of the United States from colonial times to the present. An analytical course concerned with the application of economic theory in the study of the growth and development of the American economy.

ECON 545. Urban Economics. 3 Credits.

An analysis of the economic factors which give rise to the formation of urban centers and which contribute to the following problems: urban poverty, housing conditions, traffic congestion, and the fiscal crisis faced by modern cities.

ECON 547. Natural Resource and Environmental Economics. 3 Credits.

Topics discussed include conservation and scarcity, market failure, fishery management, benefit-cost analysis, water resource development, environmental quality, recreation, energy, and marine resources.

ECON 551. History of Economic Thought. 3 Credits.

A study of the history of economic theory with attention to the economic ideas and philosophy of Adam Smith, David Ricardo, Karl Marx, J.M. Keynes and other major figures in the development of economics.

ECON 554. Economic Development. 3 Credits.

This course is intended to provide an introduction to the problems of economic development in the Third World, including the problems of economic growth, income distribution, poverty, urbanization, uneven development, agricultural policy, economic planning, industrial policy, trade policy, balance of payments, finance, and currency crises. To illustrate these issues we will examine the problems of certain individual countries, such as Brazil, Korea, Philippines, India, Mexico, Kenya, Indonesia, and Thailand. In the course we try to strike a balance between economic theory and institutional economics.

ECON 555. Comparative Economic Systems. 3 Credits.

This course examines and compares different economies from around the world, including such economies as the UK, France, Germany, Sweden, Japan, India, Korea, Russia, and China. Students look at the economic growth, GDP per capita, unemployment, inflation, income distribution, economic efficiency, institutions, policies, industrial structure, legal infrastructure, and international trade of these economies. Students study the functioning of markets and the problems of market and government failure. The course addresses the question, what is the best way to organize society?.

ECON 556. Economics of Information, the Internet and E-Commerce. 3 Credits.

Outlines the economic principles of information that underpin the Internet and e-commerce. Considers auctions, economies of scale and scope, data mining, price discrimination, product bundling, versioning, networking, the diffusion of innovations and intellectual property as they are utilized on the Internet and in e-commerce. Taught in a microcomputer laboratory.

ECON 595. Selected Topics in Economics. 1-3 Credits.

Taught on an occasional basis. A study of selected topics, the title of which will appear in the course schedule. Prerequisites: Permission of the instructor.

ECON 604. Managerial Economics and International Trade. 3 Credits.

Demand and supply, theory of optimizing behavior, demand elasticity, demand forecasting, production, costs, pricing with market power, multiple plants, markets and products, profit maximization, uncertainty, international trade and tariffs. (Credit may not be applied toward the M.A. in Economics.) Pre- or corequisite: BNAL 600 or URBN 606.

ECON 607. Managerial Economics. 2 Credits.

This course introduces the MBA student to the use of economic analysis to aid managerial decision-making. Topics include demand and supply, theory of optimizing behavior, demand elasticity, production, cost analysis and pricing with and without market power. Other topics include an introduction to game theory, alternative pricing techniques and the internal organization of firms. Prerequisites: Admission to the MBA Program, MBA 600, MBA 601, MBA 602, MBA 603, and MBA 604.

ECON 612. Global and Applied Macroeconomics. 3 Credits.

Measurements and indicators of economic activity; short-run macroeconomic analysis, credit markets, demand for money, institutional factors in money and banking, money creation, and monetary policy, long-run macroeconomics, short-run macroeconomic comparative statics, foreign exchange markets; description and history of business cycles, inflation, economic growth and public policies. (Credit may not be applied toward the M.A. in economics.) Prerequisites: ECON 604.

ECON 618. Global Macroeconomics. 2 Credits.

This course examines the measurement of macroeconomic variables and their movements over time. Short-run and long-run models of the macroeconomy are covered along with institutional factors of financial markets. The course mixes theory with real world applicability. Students will examine critical economic policy issues of the day. Prerequisites: Admission to the MBA Program, MBA 600, MBA 601, MBA 602, MBA 603, and MBA 604.

ECON 625. Mathematical Economics. 3 Credits.

This course focuses on the use of mathematical techniques in solving complex economic problems. Primary emphasis is given to matrix algebra, differential calculus, constrained optimization techniques and dynamic optimization techniques. Prerequisites: ECON 604 or ECON 612 or ECON 650.

ECON 650. International Economics. 3 Credits.

An analysis of international trade theory, commercial policy, foreign exchange markets, open economy macroeconomics, and balance of payments. The course provides the theoretical basis to understand contemporary international economic issues. (Credit may not be applied toward the M.A. in economics.)

ECON 668. Economics Internship. 1-3 Credits.

The course is a practicum in the field of economics applying theories, concepts, and quantitative tools in a professional environment. Prerequisites: Twelve hours of economics and permission of the graduate program director.

ECON 695. Selected Topics in Economics. 1-3 Credits.

Advanced topics in economics specifically designed for school teachers. (Credit may not be applied toward the M.A. in economics or the MBA.) Prerequisites: Permission of the instructor.

ECON 696. Selected Topics in Economics. 1-3 Credits.

Advanced topics in economics are covered in this course.

ECON 697. Readings in Economics. 3 Credits.

Individual readings in a selected field under the direction of a faculty member of the department.

ECON 698. Economic Methodology and Research. 3 Credits.

Individual research under the direction of a faculty member of the department.

ECON 699. Thesis. 6 Credits.

Directed research for thesis.

ECON 701. Advanced Economic Analysis: Microeconomics. 3 Credits.
Concepts and techniques of modern microeconomic theory, development in the theory of utility and demand, theory of the firm and market, partial and general equilibrium analysis. Prerequisites: ECON 604 or equivalent. Pre- or corequisite: ECON 625.

ECON 703. Advanced Economic Analysis: Macroeconomics. 3 Credits.
Study of income, employment, the price level, money, and the effect of government policy under static and dynamic conditions. Mainstream and alternative theories considered. Prerequisites: ECON 612 or equivalent. Pre- or corequisite: ECON 625.

ECON 706. Econometrics I. 3 Credits.
Single-equation econometric models; serial correlation, heteroscedasticity, specification error, missing observations, and errors-in-variables and forecasting. Prerequisites: ECON 604 or equivalent and ECON 612 or equivalent. Pre- or corequisite: ECON 625.

ECON 707. Econometrics II. 3 Credits.
Multi-equation econometric models; problems such as identification, single-equation estimation, estimation of equation systems, and model evaluation techniques; time-series models such as autoregressive and moving average models; forecasting with time-series models. Prerequisites: ECON 706 or equivalent.

ECON 708. Econometrics III. 3 Credits.
Issues in cross-section and panel data, focuses on problems such as selection bias, heterogeneity, unobserved heterogeneity, treatment effects, truncation and censoring. The course covers multivariate techniques such as principal component analysis and factor analysis, along with event studies and nonparametric and semiparametric estimators. Prerequisites: ECON 707 or equivalent.

ECON 752. International Trade. 3 Credits.
Pure theory of international trade, mathematical models of trade, instruments of trade policy, theory and practice of economic integration, trade liberalization issues from international and regional viewpoints. Prerequisites: ECON 604 or ECON 650 or equivalent.

ECON 753. International Finance. 3 Credits.
International capital flows, exchange rates and price level, income, money supplies, inflation, international liquidity, causes of international balance and imbalance, balance-of-payments adjustments. Monetary magnitudes as a basis for insight into international financial policies. Prerequisites: ECON 612 or ECON 650 or equivalent.

ECON 754. Economic Development. 3 Credits.
Introduction to the problems of economic development in the third world, including the problems of economic growth, income distribution, poverty, urbanization, uneven development, agricultural policy, economic planning, industrial policy, trade policy, balance of payments, finance, and currency crises. Prerequisites: ECON 604 or ECON 650.

ECON 795. Selected Topics in Economics. 1-3 Credits.
Designed to provide the advanced student with an opportunity to study independently or in small groups and investigate specific topics of current interest in the field of economics. Prerequisites: Ph.D. standing and permission of the chair and coordinator.

ECON 801. Advanced Economic Analysis: Microeconomics. 3 Credits.
Concepts and techniques of modern microeconomic theory, development in the theory of utility and demand, theory of the firm and market, partial and general equilibrium analysis. Prerequisites: ECON 604 or equivalent. Pre- or corequisite: ECON 625 or equivalent.

ECON 803. Advanced Economic Analysis: Macroeconomics. 3 Credits.
Study of income, employment, the price level, money, and the effect of government policy under static and dynamic conditions. Mainstream and alternative theories considered. Prerequisites: ECON 612 or equivalent. Pre- or corequisite: ECON 625.

ECON 806. Econometrics I. 3 Credits.
Single-equation econometric models; serial correlation, heteroscedasticity, specification error, missing observations, and errors-in-variables and forecasting. Prerequisites: ECON 604 or equivalent and ECON 612 or equivalent. Pre- or corequisite: ECON 625.

ECON 807. Econometrics II. 3 Credits.
Multi-equation econometric models; problems such as identification, single-equation estimation, estimation of equation systems, and model evaluation techniques; time-series models such as autoregressive and moving average models; forecasting with time-series models. Prerequisites: ECON 806 or equivalent.

ECON 808. Econometrics III. 3 Credits.
Issues in cross-section and panel data, focuses on problems such as selection bias, heterogeneity, unobserved heterogeneity, treatment effects, truncation and censoring. The course covers multivariate techniques such as principal component analysis and factor analysis, along with event studies and nonparametric and semiparametric estimators. Prerequisites: ECON 807 or equivalent.

ECON 852. International Trade. 3 Credits.
Pure theory of international trade, mathematical models of trade, instruments of trade policy, theory and practice of economic integration, trade liberalization issues from international and regional viewpoints. Prerequisites: ECON 604 or ECON 650 or equivalent.

ECON 853. International Finance. 3 Credits.
International capital flows, exchange rates and price level, income, money supplies, inflation, international liquidity, causes of international balance and imbalance, balance-of-payments adjustments. Monetary magnitudes as a basis for insight into international financial policies. Prerequisites: ECON 612 or ECON 650 or equivalent.

ECON 854. Economic Development. 3 Credits.
Introduction to the problems of economic development in the third world, including the problems of economic growth, income distribution, poverty, urbanization, uneven development, agricultural policy, economic planning, industrial policy, trade policy, balance of payments, finance, and currency crises. Prerequisites: ECON 604 or ECON 650.

ECON 895. Selected Topics in Economics. 1-3 Credits.
Designed to provide the advanced student with an opportunity to study independently or in small groups and investigate specific topics of current interest in the field of economics. Prerequisites: Ph.D. standing and permission of the chair and coordinator.

ECON 998. ECON 998. 1 Credit.

ECON 999. Economics 999. 1 Credit.
This is registration required of all graduate students who must maintain active status at the university prior to graduation.

ELS - Educational Leadership and Services

EDUCATIONAL LEADERSHIP AND SERVICES Courses

ELS 596. Topics in Education. 1-3 Credits.

ELS 597. Topics in Education. 1-3 Credits.
The College of Education offers selected topics designed to permit small groups of qualified students to work on subjects of mutual interest which, due to their specialized nature, may not be offered regularly. Prerequisite: permission of the instructor.

ELS 598. Topics in Education. 1-3 Credits.
The College of Education offers selected topics designed to permit small groups of qualified students to work on subjects of mutual interest which, due to their specialized nature, may not be offered regularly. Prerequisite: permission of the instructor.

ELS 600. Principal Orientation and Instructional Leadership. 3 Credits.
An introduction to educational leadership to develop a capacity for reflective practice which unifies theory and knowledge for the improvement of instruction. Students will begin to understand their leadership potential through reflection, self-analysis, and instructor feedback via diagnostic assessment and case studies for principals. Students develop an administrative portfolio skills assessment. Required entry level course.

ELS 610. School Community Relations and Politics. 3 Credits.

Lecture 3 hours; 3 credits. Pre- or Corequisite: ELS 600. An introduction for prospective administrators to the social, political context in which they work. Emphasis will be placed on: understanding and using leadership skills in designing programs around the needs and problems of the school and its special publics; relating with the media; improving communication skills; and using skills in negotiations and conflict management.

ELS 621. Curriculum Development and Assessment. 3 Credits.

Lecture 3 hours; 3 credits. Pre- or Corequisite: ELS 600. A course designed to create a basic understanding of the comprehensive nature of the curriculum development process K-12, from a school leadership perspective. Students will explore theoretical, strategic, and organizational issues associated with curriculum development including multiculturalism, cognitive development, curricular patterns and connections, and assessment and evaluation.

ELS 623. Design of Service Delivery Plans to Meet the Needs of Military Connected Children and Families. 4 Credits.

Lecture, 3 hours; Service Learning, 1 hour. 4 credits. Prerequisite: COUN 605 and FOUN 662 and acceptance into the Military Child and Family Education Certificate Program. Students will apply their foundational and assessment knowledge for supporting military students to a capstone project in service delivery program design. This course will engage participants in surveying and considering a range of services, program elements, and strategies that may be employed to improve educational, social, and emotional school experiences for children of military-related families. Participants will engage in processes for selecting and preparing to implement optimal support strategies and structures to meet the identified needs of military students in their school setting. They will become familiar with and prepared to craft specific plans to utilize, for the benefit of military children, their peers and families: (a) various school, community, and government services; (b) classroom- and school-based programs designed to improve academic achievement and/or emotional well-being; and (c) classroom- and school-based strategies for designing and implementing programs and services that meet the needs of these children and their families. This course is required for completion of the Military Child and Family Education graduate certificate. Students must be accepted into the certificate program or receive approval from the certificate program director in order to enroll.

ELS 626. Instructional Supervision, Staff Development, and Assessment. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisites: ELS 610 and ELS 621. Pre- or Corequisite: ELS 600. Through site-based projects, scripts, enactments, case study analysis, and reflection, course participants apply theories and best practices to develop the skills and strategies that leaders use with individuals and groups to facilitate excellence in teaching and learning.

ELS 657. Public School Law. 3 Credits.

Lecture 3 hours; 3 credits. Pre- or Corequisite: ELS 600. This course is an introduction to law, particularly with respect to federal and state statutes and court decisions dealing with the public schools. The topics span the full spectrum of law-related concerns. By necessity, it is first a theoretical course; however, the outcomes are intended to be practical by providing the legal understanding necessary for a school administrator to negotiate his or her way through the maze of difficult legal matters commonly faced each day by school and district leaders.

ELS 660. Program Evaluation, Research and Planning. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: ELS 600. In this course principal licensure candidates learn to identify organizational needs, develop research-based strategies to address those needs, and use data-driven planning to implement, monitor, and manage processes involved in implementing change strategies.

ELS 667. Cooperative Education. 1-3 Credits.**ELS 668. Internship in Educational Leadership. 3-6 Credits.**

3-6 credits. Prerequisite: ELS 600 and ELS 669, passing scores on the appropriate PRAXIS II content examination or permission of instructor. The university and site supervisor will work with the educational leadership candidate in PreK through 12 and central office settings to provide the candidate with appropriate experiences to demonstrate competencies required by the Educational Leadership Constituent Council and the Virginia Department of Education.

ELS 669. Instructional Internship. 3 Credits.

Title credits 20 hrs; 3 credits. Prerequisite: ELS 673. Each internship course will require students to complete a minimum of 160 hours in each course. Course is designed to provide field experiences which will prepare them to serve as instructional and curriculum leadership in K-12 environments. Student must produce 1) a portfolio with required artifacts; 2) prepare a 10-12 reflective paper according to identified guidelines and 3) complete internship evaluation with mentor and college supervisor at least three times during the term.

ELS 673. Critical Issues Research. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisites: ELS 600, ELS 610, ELS 621, ELS 626, and ELS 660. The student completes an in-depth study of a critical issue in his/her profession and documents the work in a critical issue paper. Student must be able to demonstrate written and oral communication skills and critical and analytical skills in dealing with a major issue in educational leadership. Course to be taken near completion of program.

ELS 697. Topics in Educational Leadership. 1-6 Credits.

1-6 credits. The study of selected topics in educational leadership. Arranged individually with students.

ELS 700. Leadership and Management for School Improvement. 3 Credits.

This course is designed to give students entering the ODU Licensure program an understanding of the complex roles and challenges of a school principal, while focusing on the constantly changing nature of administrative responsibility. Students develop an integrated view of the knowledge base, research and practice of administration within a context of multiple perspectives and a wide range of thinking. The purpose of the course is to increase understanding of education, the role of educational administration, the forces that are moving education into a new era, the transitions that are occurring, and the use of the latest, best practices to improve the education of all children.

ELS 701. Accountability and Organizational Improvement. 3 Credits.

This course is an in-depth study of effective data based decision-making practices for contemporary school leaders. Formative and summative data based decision making practices will be explored, as well as how to work with large and small groups of staff members to analyze multiple measures of data and create school improvement designs for student and school success. An emphasis is placed on using data to make decisions at the division, school, and classroom levels. Prerequisite: ELS 600 or ELS 700.

ELS 702. Educational Politics and Policymaking. 3 Credits.

This course teaches aspiring school leaders how politics and policy shapes school-based decision making and how school leaders can influence politics and policy processes to improve learning environments for children. The course focuses contemporary problems that confront school leaders as they work to improve the conditions of learning for their students, faculty and staff. To effectively address and solve problems school leaders need to understand the processes of policymaking at various educational levels and to develop the relevant skills of policymaking needed at the school level. Thus, this course addresses the following three essential principles of educational politics and policy as they apply to school level administrators: political and policy dynamics that influence their work in schools; accurately identify, diagnose, and develop the right solutions to the right problems in order to achieve instructional goals of the school and division; and confront, engage in, and effectively deal with conflict (i.e., politics) emanating from within the school, division, or community in order to achieve school and division learning goals. Prerequisite: ELS 600 or ELS 700.

ELS 710. Strategic Communication and External Relations. 3 Credits.
This course serves as an introduction for prospective administrators to the social and political context of the educational environment. The underlying concept of this course is collaboration. Today's administrators face a variety of multifaceted challenges in their daily routines. Therefore, they must recognize the impact of political, socioeconomic situations, community diversity, equity issues, and school community relations on their leadership practices. Prerequisite: ELS 600 or ELS 700.

ELS 727. Learning Theories and Professional Development. 3 Credits.
This course exposes students to the essential elements of instructional leadership. Central to the skills and knowledge necessary to be an effective instructional leader are a deep understanding of the learning sciences that inform us about the essence of effective teaching. Effective instructional leaders have a solid basis for assessing and promoting high quality instruction, giving them the tools to proactively build a school's organizational capacity of sustained growth in student achievement. Students will engage in reading, reflection, dialog, writing, problem solving and field-work, designed to build an understanding of how these topics are intrinsically tied to supporting teachers in their classrooms through facilitating better understandings of standards and accountability, effective lesson planning and curriculum development, assessment and grading, classroom management and discipline. Prerequisite: ELS 600 or ELS 700.

ELS 728. Instructional Leadership and Supervision. 3 Credits.
This course develops student's skills, knowledge and dispositions in the area of instructional leadership. Students will explore how effective instructional leaders can use their integrated knowledge of quality instruction and the core principles of learning to set the mission and vision for the school, facilitate school improvement planning and professional development and finally how instructional supervision is used to integrate these activities and support the growth of individual teachers as well as building organizational capacity. Effective instructional leaders have a solid basis for assessing and promoting high quality instruction, giving them the tools to proactively build a school's organizational capacity for sustained growth in student achievement. Students will engage in reading, reflection, dialog, writing, problem solving and field-work, designed to help them build an integrated understanding of those leadership practices that help support teacher instructional growth and those that build organizational capacity for sustained improvement. Prerequisite: ELS 600 or ELS 700.

ELS 753. Educational Finance and Budgeting. 3 Credits.
This course examines how public schools are financed, including an analysis of the sources of revenues, the distribution of revenue, and the budgeting and expenditure of revenue. Special emphasis will be placed on the Virginia funding formula, education as an investment in human capital, and how funding relates to student achievement. Students will learn the fiscal management skills and understandings necessary to manage the finances of a school or school system, including the study of system and school procedures related to budget planning, budget management, internal school account management, inventory control, and purchasing procedures. Prerequisite: ELS 600 or ELS 700.

ELS 754. Human Resource Development and Evaluation. 3 Credits.
Lecture 3 hours; 3 credits. Prerequisite: ELS 600. This course focuses on the development of various staff personnel functions. Collaborative staff development and performance evaluation are linked to organizational goals, culture and learner achievement. Application of knowledge and skills via case study, simulation and oral and written demonstration projects is included.

ELS 757. Educational Law and Ethics. 3 Credits.
This course is an introduction to law, particularly with respect to federal and state statutes and court decisions dealing with the public schools. The topics span a wide spectrum of law-related concerns. The study of law is intended to be practical by providing the legal understanding necessary for a school administrator to negotiate his or her way through the maze of difficult legal and ethical matters commonly faced each day. Prerequisite: ELS 600 or ELS 700.

ELS 764. History and Philosophy of American Public School Reform. 3 Credits.

Lecture 3 hours; 3 credits. This course covers the major historical movements, especially in school reform, and key American educational philosophers. This course will provide prospective school administrators with a historical and philosophical foundation of education.

ELS 787. Pupil Personnel Services for Diverse Populations. 3 Credits.
Lecture 3 hours; 3 credits. Prerequisite: ELS 600. This course focuses on the theories and skills that leaders need in order to administer the broad array of special services (i.e., special education, bilingual programming, counseling, and psychological, social work, and therapy services) so that students with all diverse needs are included in regular education.

ELS 795. Topics in Educational Leadership. 1-3 Credits.
1-3 credits. Prerequisite: permission of the instructor.

ELS 797. Topics in Educational Leadership. 1-3 Credits.

ELS 800. Strategic Leadership and Management for School Improvement. 3 Credits.

This course is designed to give students entering the ODU Licensure program an understanding of the complex roles and challenges of a school principal, while focusing on the constantly changing nature of administrative responsibility. Students develop an integrated view of the knowledge base, research and practice of administration within a context of multiple perspectives and a wide range of thinking. The purpose of the course is to increase understanding of education, the role of educational administration, the forces that are moving education into a new era, the transitions that are occurring, and the use of the latest, best practices to improve the education of all children.

ELS 801. Accountability and Organizational Improvement. 3 Credits.
This course is an in-depth study of effective data based decision-making practices for contemporary school leaders. Formative and summative data based decision making practices will be explored, as well as how to work with large and small groups of staff members to analyze multiple measures of data and create school improvement designs for student and school success. An emphasis is placed on using data to make decisions at the division, school, and classroom levels. Prerequisite: ELS 600 or ELS 700 or ELS 800.

ELS 802. Educational Politics and Policymaking. 3 Credits.
This course teaches aspiring school leaders how politics and policy shapes school-based decision making and how school leaders can influence politics and policy processes to improve learning environments for children. The course focuses contemporary problems that confront school leaders as they work to improve the conditions of learning for their students, faculty, and staff. To effectively address and solve problems school leaders need to understand the processes of policymaking at various educational levels and to develop the relevant skills of policymaking needed at the school level. Thus, this course addresses the following three essential principles of educational politics and policy as they apply to school level administrators: political and policy dynamics that influence their work in schools; accurately identify, diagnose, and develop the right solutions to the right problems in order to achieve instructional goals of the school and division; and confront, engage in, and effectively deal with conflict (i.e., politics) emanating from within the school, division, or community in order to achieve school and division learning goals. Prerequisite: ELS 600 or ELS 700 or ELS 800.

ELS 806. The Urban System. 3 Credits.
Lecture 3 hours; 3 credits. Prerequisite: permission of the graduate program director. Introduces students to the discipline of urban studies by focusing on various aspects of the city and cultural diversity. Provides an interdisciplinary overview of economic development and redevelopment, environmental factors, educational systems, health care systems, and government systems. Examines the extent to which urban systems impact diverse residents' lives.

ELS 810. Strategic Communication and External Relations. 3 Credits.

This course serves as an introduction for prospective administrators to the social and political context of the educational environment. The underlying concept of this course is collaboration. Today's administrators face a variety of multifaceted challenges in their daily routines. Therefore, they must recognize the impact of political, socioeconomic situations, community diversity, equity issues, and school community relations on their leadership practices. Prerequisite: ELS 600 or ELS 700 or ELS 800.

ELS 811. Leadership Theory for Educational Improvement. 3 Credits.

Lecture 3 hours; 3 credits. This course provides the necessary knowledge to become an integral part of the educational improvement process at the school, division, and state levels. Students will analyze and relate the significant educational trends of the past 20 years to the political process, analyzing the impact on school planning. Students will take an active and vocal role in the discourse and debate about educational policy and practice. Emphasis will be placed on analyzing the context and implementing planning systems to develop mission, goals and programs that result in educational improvement.

ELS 815. Leadership for Equity and Inclusive Education. 3 Credits.

Lecture 3 hours; 3 credits. This course focuses on the theories and practices that help educational leaders ensure that students with special needs receive an equitable and inclusive education. Emphasis is on perspectives of difference versus deviance, historical foundations of specialized programs, current social and legal contexts that influence programming, questions of social justice, and possibilities for the inclusion of all students. While this course addresses the needs of all students, concentration is on individuals with disabilities and the laws that safeguard their rights.

ELS 821. Policy and Politics in Educational Leadership. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: ELS 811. This course focuses on the theories and practices needed to build relationships and support from the state political process, the local community, businesses, and media. Emphasis will be placed on the use of influence, and its impact on relationships, policies, and programs. Focus is placed on developing a shared vision to bring schools and communities together as partners in improving student learning. Two-way communication mechanisms for school improvement using political influence and power are examined.

ELS 827. Learning Theories and Professional Development. 3 Credits.

This course exposes students to the essential elements of instructional leadership. Central to the skills and knowledge necessary to be an effective instructional leader are a deep understanding of the learning sciences that inform us about the essence of effective teaching. Effective instructional leaders have a solid basis for assessing and promoting high quality instruction, giving them the tools to proactively build a school's organizational capacity of sustained growth in student achievement. Students will engage in reading, reflection, dialog, writing, problem solving and field-work, designed to build an understanding of how these topics are intrinsically tied to supporting teachers in their classrooms through facilitating better understandings of standards and accountability, effective lesson planning and curriculum development, assessment and grading, classroom management and discipline. Prerequisite: ELS 600 or ELS 700 or ELS 800.

ELS 828. Instructional Leadership and Supervision. 3 Credits.

This course develops student's skills, knowledge and dispositions in the area of instructional leadership. Students will explore how effective instructional leaders can use their integrated knowledge of quality instruction and the core principles of learning to set the mission and vision for the school, facilitate school improvement planning and professional development and finally how instructional supervision is used to integrate these activities and support the growth of individual teachers as well as building organizational capacity. Effective instructional leaders have a solid basis for assessing and promoting high quality instruction, giving them the tools to proactively build a school's organizational capacity for sustained growth in student achievement. Students will engage in reading, reflection, dialog, writing, problem solving and field-work, designed to help them build an integrated understanding of those leadership practices that help support teacher instructional growth and those that build organizational capacity for sustained improvement. Prerequisite: ELS 600 or ELS 700 or ELS 800.

ELS 831. Accountability Systems in Public Education. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisites: ELS 660, 732 and 880. This course addresses the design, development, implementation, and alignment of public education accountability systems at the federal, state, and local levels. Particular attention is given to how the design and implementation of accountability systems affects educational equity and school reform efforts.

ELS 835. Organizational Theory and Behavior in Education. 3 Credits.

Lecture 3 hours; 3 credits. This course includes the psychology of organizational behaviors, theories of managing people, individual and organizational learning, individual motivation and organizational behavior, interpersonal communications and perceptions, group dynamics, problem management, managing multigroup work, managing diversity, leadership and organizational culture, leadership and decision making, the effective exercise of power and influence, supervision and employee development, organizational analysis, and managing change.

ELS 853. Educational Finance and Budgeting. 3 Credits.

This course examines how public schools are financed, including an analysis of the sources of revenues, the distribution of revenue, and the budgeting and expenditure of revenue. Special emphasis will be placed on the Virginia funding formula, education as an investment in human capital, and how funding relates to student achievement. Students will learn the fiscal management skills and understandings necessary to manage the finances of a school or school system, including the study of system and school procedures related to budget planning, budget management, internal school account management, inventory control, and purchasing procedures. Prerequisite: ELS 600 or ELS 700 or ELS 800.

ELS 854. Human Resource Development and Evaluation. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: ELS 600. This course focuses on the development of various staff personnel functions. Collaborative staff development and performance evaluation are linked to organizational goals, culture and learner achievement. Application of knowledge and skills via case study, simulation and oral and written demonstration projects is included.

ELS 857. Educational Law and Ethics. 3 Credits.

This course is an introduction to law, particularly with respect to federal and state statutes and court decisions dealing with the public schools. The topics span a wide spectrum of law-related concerns. The study of law is intended to be practical by providing the legal understanding necessary for a school administrator to negotiate his or her way through the maze of difficult legal and ethical matters commonly faced each day. Prerequisite: ELS 600 or ELS 700 or ELS 800.

ELS 864. History and Philosophy of American Public School Reform. 3 Credits.

Lecture 3 hours; 3 credits. This course covers the major historical movements, especially in school reform, and key American educational philosophers. This course will provide prospective school administrators with a historical and philosophical foundation of education.

ELS 869. Instructional Internship. 3 Credits.

Title credits 20 hrs; 3 credits. Prerequisite: ELS 673. Each internship course will require students to complete a minimum of 160 hours in each course. Course is designed to provide field experiences which will prepare them to serve as instructional and curriculum leadership in K-12 environments. Student must produce 1) a portfolio with required artifacts; 2) prepare a 10-12 reflective paper according to identified guidelines and 3) complete internship evaluation with mentor and college supervisor at least three times during the term.

ELS 871. Educational Systems Planning and Futures. 3 Credits.

Lecture 3 hours; 3 credits. The course covers the theoretical framework of strategic, operational, cooperative and future planning in education, leading to the development of a cyclic planning process which includes the appropriate tasks, steps and skills to effect administrative and policy change.

ELS 873. Advanced School Law. 3 Credits.

Lecture, 3 hours. 3 credits. Advanced Education Law--doctoral level.

ELS 874. Advanced School Finance, and Operations. 3 Credits.

Lecture, 3 hours; 3 credits. Prerequisites: ELS 753/853 or equivalent. This course examines social justice issues related to the financial, political, and operational aspects of America's public schools. The politics of current legislation, court cases, finances, and operations of the school system are included.

ELS 876. Leadership for Social Justice. 3 Credits.

Lecture 3 hours; 3 credits. In this course, students study and engage in dialogue related to the critical role of education in a democratic society in a rapidly changing and increasingly complex world. Through a focused discussion of theories and concepts such as democratic schools, social justice, critical theory and power, feminism, critical race theory, and difference/normalization, students come to understand the possible roles education can play in society and their need to continuously reflect on their own vision for leadership in public schools.

ELS 878. Leadership for Teaching and Learning. 3 Credits.

Lecture 3 hours; 3 credits. In this course, participants examine what is currently known and explore what needs to be known about pedagogy in a context of school renewal. The foundational perspective for the course is social justice in which course participants seek ways to transform teaching/instruction so that all schools work for all students particularly those students who historically have been disenfranchised from receiving an equitable education.

ELS 879. Field Research in School Administration and Supervision. 3 Credits.

3 credits. Prerequisite: a master's degree. Field study approach to problems related to school administration and supervision.

ELS 880. Multicultural Curriculum Leadership and Globalization. 3 Credits.

This course examines social justice issues related to the curriculum leadership aspect of American's public schools and abroad. This course is designed to provide advanced understanding of the curriculum development process through conception, implementation, and evaluation with a particular focus on multiculturalism. Theoretical and philosophical bases of curriculum development are addressed as well as current trends including brain-based learning, multiculturalism, globalization, organizational thinking and the strategic change process.

ELS 883. Contemporary Issues in Education. 3 Credits.

Lecture 3 hours; 3 credits. This course is a survey of current issues in education, as well as the political, financial, and social issues affecting education leadership. The course will explore relationships between current issues, historical perspectives, philosophical theories, and sociologic influences. The exploration of contemporary issues related to equity and achievement will serve as a critical component of the class.

ELS 895. Topics in Educational Leadership. 1-3 Credits.

1-3 credits. Prerequisite: permission of the instructor.

ELS 896. Topics in Urban Educational Leadership. 1-3 Credits.

1-3 credits. Prerequisite: master's degree and permission of the instructor.

ELS 897. Topics in Educational Leadership. 1-3 Credits.**ELS 899. Dissertation. 1-12 Credits.**

1-12 credits. Prerequisite: permission of faculty advisor.

ELS 998. ELS 998. 1 Credit.**ELS 999. ELS 999. 1 Credit.**

1 credit. This is a placeholder course for students who must be registered for a class and who are not registered for dissertation credit.

ENGL - English

ENGLISH Courses

ENGL 503. Medieval Literature. 3 Credits.

An introduction to representative works of English literature (some in translation) from Beowulf through Chaucer's Canterbury Tales, The Book of Margery Kempe, The Second Shepherd's Play, and Malory's Morte d'Arthur. Students will discover how medieval literature has contributed to and continues to complicate modern conceptions of reading, writing, and aesthetics.

ENGL 506. The Teaching of Literature. 3 Credits.

This course is designed to provide an intensive examination of issues, approaches, and methods utilized in the teaching of literature, particularly literature written for children and young adults.

ENGL 507. Chaucer's Canterbury Tales. 3 Credits.

A study of The Canterbury Tales with an introduction to Middle English language and culture.

ENGL 514. Motherhood: Texts and Images. 3 Credits.

This course examines the role of the mother, the experience of mothering and the institution of motherhood through a number of disciplinary and theoretical lenses. It considers how motherhood functions to women's advantage or disadvantage in professional and economic areas as well as the mother's ideological construction in public discourse, imagery, non-fiction, and film.

ENGL 516. English Renaissance Drama. 3 Credits.

An extensive survey of the secular national dramas of Renaissance England that were written and performed by Shakespeare's contemporaries in London between 1576 and 1642. Students study the literary features, social contexts and ideological underpinning of representative works by Kyd, Marlowe, Jonson, Webster, Ford, and others.

ENGL 518. Jewish Writers. 3 Credits.

This course introduces students to the Jewish literary traditions and the cultural trends shaping these traditions and the Jewish identity. It will examine the impact of such issues as immigration, family, marginality, the Holocaust, assimilation, cultural diversity, feminism, Israel, race and religion. The readings will consist of short stories, poems, essays, novels, and autobiographical writing.

ENGL 521. British Literature 1660-1800. 3 Credits.

British literature from the Restoration of the monarchy after the Civil War and Puritan Commonwealth to the French Revolution, focusing on how cultural changes (legalized female actors, commercialized printing, colonialism, and growing market capitalism) interacted with the flowering of satire and scandalous theatrical comedy, and the emergence of modern literary forms (periodical journalism, "picturesque" poetry, and the novel).

ENGL 523. The Romantic Movement in Britain. 3 Credits.

A study of the literature written in Britain between 1770-1830, focusing on how the literary experiments and innovations of poets like Blake, Wordsworth, Coleridge, Byron, Percy Shelley, Keats, Burns, and Barbauld, and of novelists like Mary Shelley, Radcliffe, and Scott interacted with cultural changes such as the Industrial Revolution, the French Revolution, and the emergence of feminism and working-class radicalism.

ENGL 524. Short Works in Narrative Media. 3 Credits.

This course examines short narrative forms in film, video, literature, and multi-media. Individual works will be considered, both for the specific ways in which they make use of the medium in which they appear and for the qualities they share. Particular emphasis will be placed on the relationship between writing and visualization. Students will engage in both creative and critical exercises, so as to see the process from both sides: creative production and critical analysis.

ENGL 525. World Film Directors in Context. 3 Credits.

This course will explore the works of several directors from a variety of world regions. Films will be considered as part of the body of work by each director, as well as in the context of the regions' other arts, traditions, popular culture, and historical events. Students will become familiar, therefore, with aesthetic, literary, sociological, anthropological and historical approaches to the analysis of film.

ENGL 527. Writing in the Disciplines. 3 Credits.

This is a discussion/workshop course emphasizing contexts and strategies of text production in and across academic disciplines and professional settings. Students will produce a variety of texts designed to meet the needs of specific audiences. (This is a writing intensive course.)

ENGL 532. Origins and Early Development of the British Novel to 1800. 3 Credits.

A study of early novels and how the novel developed from other traditions such as the epic, romance, criminal biography, and travel narrative.

ENGL 533. Victorian Literature. 3 Credits.

A study of the chief writers and the cultural and philosophical backgrounds of the Victorian era, touching on the changes from the early to the later part of the period. Works analyzed include fiction, nonfiction prose, and poetry.

ENGL 535. Management Writing. 3 Credits.

This course focuses on writing as a means of making and presenting management decisions.

ENGL 538. The Twentieth-Century British Novel. 3 Credits.

Examination and analysis of a variety of novels in their editorial and cultural contexts.

ENGL 539. Writing in Digital Spaces. 3 Credits.

This course offers composition practice in critical contemporary digital environments. Readings and discussions will provide the history of and context for these digital spaces. Students should expect to participate in, develop, and engage in critical discussions about a range of digital spaces, including websites, wikis, blogs, and various interactive media.

ENGL 540. General Linguistics. 3 Credits.

An introduction to linguistic analysis. Emphasis is on the analysis of sound systems (phonetics, phonology) and the structure of words and sentences (morphology and syntax).

ENGL 541. American Travel Literature. 3 Credits.

This is a survey course that examines the American experience, American identity and American culture through travel "texts" that include prose, poetry, art, and film. The course takes an interdisciplinary American Studies approach, using lenses such as race, gender, and class.

ENGL 542. English Grammar. 3 Credits.

This course is a descriptive study of English grammar as it relates to the contexts in which it is used, with implication for grammar pedagogy and TESOL classrooms.

ENGL 543. Southern and African American English. 3 Credits.

This course focuses on the linguistic diversity of the American South, with emphasis on Southern White and African American varieties of English. It examines variation and change in the phonological, lexical, and syntactic systems, language contact, and dialect discrimination directed towards Southern and African American speakers both inside and out of the South.

ENGL 544. History of the English Language. 3 Credits.

A study of the origins and development of the English language. Primary focus is on sound, word, and grammatical changes.

ENGL 546. Studies in American Drama. 3 Credits.

With rotating topics, this course will pursue particular themes or periods in American drama and theater. Potential areas of inquiry might include melodrama, the early transatlantic stage, rise of stage realism, age of O'Neill, or the contemporary drama.

ENGL 547. The American Novel to 1920. 3 Credits.

Examination of the American novel from its origins in the late eighteenth century through World War I. The course will emphasize the novel as a genre, cultural trends during the period, and such relevant literary modes as romanticism, realism, and naturalism.

ENGL 548. The American Novel 1920 to Present. 3 Credits.

Examination of the American novel from the end of World War I to the present day. The course will emphasize formal issues related to the genre of the novel and relevant literary and cultural trends during the period including modernism and postmodernism.

ENGL 549. Craft of Literary Nonfiction. 3 Credits.

A detailed study of technique in literary nonfiction with an emphasis on the memoir, the essay, reportage, and travel narrative. Especially designed for, but not limited to, creative writing students; supplements the creative writing workshops. Prerequisites: ENGL 300 and six semester hours in literature, or three semester hours in literature and permission of the instructor.

ENGL 550. American English. 3 Credits.

This course explores the geographic, social and stylistic diversity of English spoken in the U.S. It also examines how perceptions of dialect diversity affect access to education and other socioeconomic opportunities.

ENGL 551. Advanced Fiction Workshop. 3 Credits.

This course, an expansion of the principles and techniques learned in ENGL 451, focuses on the writing and criticism of the short story, the novella, and the novel. May be repeated for credit. Prerequisites: ENGL 351 or permission of the instructor, based on writing samples submitted.

ENGL 552. Advanced Poetry Workshop. 3 Credits.

This course, an expansion of the principles and techniques learned in ENGL 452, focuses on the writing and criticism of poetry. May be repeated for credit. Prerequisites: ENGL 352 or permission of the instructor, based on writing samples submitted.

ENGL 554. Creative Nonfiction. 3 Credits.

A course in the techniques of writing nonfiction imaginatively within a factual context. Emphasis is placed on concern for reader psychology, selection of significant detail, and the development of a style at once lively and lucid. Assignments are made individually with regard to the student's field of interest—history, biography, science, politics, informal essay, etc. Advice is given on the marketing of promising manuscripts. May be repeated for credit. Prerequisites: ENGL 327W or ENGL 351 or permission of the instructor, based on writing samples submitted.

ENGL 555. The Teaching of Composition, Grades 6-12. 3 Credits.

Lecture 3 hours; 3 credits. A study of the theory and practice of teaching writing. Special attention will be given to the ways effective teachers allow theories and experiences to inform their pedagogical strategies.

ENGL 556. The Craft of Fiction. 3 Credits.

A detailed study of fictional technique in the novel and short story, with emphasis on character development, conflict, point of view, plot, setting, mood, tone, and diction. Especially designed for, but not limited to, creative writing students; supplements the creative writing workshops. Prerequisites: ENGL 300 or permission of the instructor.

ENGL 557. The Craft of Poetry. 3 Credits.

A detailed study of technique in poetry, with emphasis on form, imagery, rhythm, and symbolism. Especially designed for, but not limited to, creative writing students; supplements the creative writing workshops. Prerequisites: ENGL 300 or permission of the instructor.

ENGL 559. New Literatures in English. 3 Credits.

A study of the diverse "new" literatures in English of the Caribbean and Central America, Africa, India, as well as of Canada and Australia, in their current historical and political contexts.

ENGL 560. The Literature of Fact. 3 Credits.

A detailed study of the literary tradition of creative nonfiction. Prerequisites: Permission of the instructor.

ENGL 561. Poetry of the Early Twentieth Century. 3 Credits.

Works of major British and American poets from 1900 to 1945 are studied.

ENGL 562. Sacred Texts as Literature. 3 Credits.

A study of how sacred texts reshape a variety of literary forms (narratives, drama, poetry, biography, history). The course may focus on a particular text or a collection of texts drawn from a variety of faith traditions and/or spiritual experiences.

ENGL 563. Women Writers. 3 Credits.

This course applies concepts developed through women's studies scholarship and feminist literary criticism to works by women writers of different races and cultures.

ENGL 564. Native American Literature. 3 Credits.

This class offers an investigation of Native American literature both past and present and seeks to foster an appreciation for indigenous cultures, traditions, and the ongoing concerns that inform so much of Native literary output. By privileging Native centered approaches to narrative and history-keeping, the course hopes to instill a greater understanding of the issues Native peoples faced in the colonial milieu and the continued implications of those histories for Native communities and indigenous identities today.

ENGL 565. African-American Literature. 3 Credits.

An investigation of the ways in which literary movements, historical events, social transitions, and political upheavals have influenced African-American literature.

ENGL 566. Asian American Literature. 3 Credits.

The course introduces students to key texts in Asian American literature, supported by critical studies (and on occasion films) to interrogate the theme of Asian American identities in their multiple forms. The course will examine sociopolitical histories that undercut the literature, and the contributions of Asian American writers to the breadth and scope of American as well as global literatures today. Prerequisites: Permission of the instructor.

ENGL 573. Writing with Video. 3 Credits.

This course engages students in a comprehensive exploration of video as a rhetorical narrative medium, with emphasis on the actual production of video work. Writing is also integrated into the production process. From brainstorming to storyboarding and critique, writing is positioned as an integral part of the course.

ENGL 577. Language, Gender and Power. 3 Credits.

This interdisciplinary course explores how language reflects and interacts with society, with particular emphasis on gender and race. Topics include definition, framing, stereotypes, language taboos, and powerful and powerless language.

ENGL 580. Investigative Reporting Techniques. 3 Credits.

This course explores how journalists pursue investigative projects that expose waste, mismanagement, conflicts of interest, dangerous business practices, and otherwise challenge the status quo. With a focus on both high tech and traditional research skills, the course will provide instruction in accessing government records kept by local, state and federal agencies. In pursuing in-depth stories that make a difference, contemporary journalists develop strategies for gathering and analyzing data, use social media in pursuit of stories and present stories for print, broadcast and online platforms.

ENGL 581. Advanced Public Relations. 3 Credits.

Designed to strengthen the skills of the public relations practitioner with emphasis on the creative aspects of problem solving. Attention is given to crisis public relations, interviewing, speech writing, and graphics.

ENGL 582. Sports Journalism. 3 Credits.

This is primarily a sportswriting course in which students are introduced to various types and styles of sports stories that are representative of sports journalism as practiced in newspapers and magazines. The course also explores the role of sports in American society.

ENGL 583. Reporting and News Writing II. 3 Credits.

Designed to familiarize students with the fundamentals of beat reporting and its practice in the multi-media environment of "converged" newsrooms. The course emphatically focuses on writing but also provides instruction on how the tools and techniques of multimedia platforms are used to enhance storytelling. Emphasis is also placed on accessing information through web-based resources and government documents.

ENGL 584. Feature Story Writing. 3 Credits.

Course includes discussion and practice of writing a variety of newspaper and magazine feature stories. Students will write and critique stories on people, places, businesses, trends, and issues. Assistance is given in the marketing of manuscripts.

ENGL 585. Editorial and Persuasive Writing. 3 Credits.

A study of the practice and function of writing editorials, commentary, reviews and columns for newspapers and online media. Lectures will focus on the techniques of crafting a persuasive argument, content analyses of Pulitzer Prize-winning editorials and columns, and guest lectures by newspaper editorial writers.

ENGL 586. Media Law and Ethics. 3 Credits.

Designed to introduce students to components of communication law that may affect the professional writer or broadcaster. Topics include defamation, constitutional constraints, freedom of information, privacy, copyright, and telecommunications law. Ethical issues relating to the mass media will also be examined.

ENGL 592. Modern World Drama. 3 Credits.

A comparative study of selected major dramatic works of the world, featuring texts drawn from a range of cultures from around the globe. The course will begin in the late nineteenth century and continue to the present. Works written in languages other than English will be read in translation.

ENGL 593. Contemporary World Literature. 3 Credits.

Fiction, poetry, and plays written during the last fifty years in nations throughout the world. Most texts will have been written originally in languages other than English. The course will focus on the comparative study of works produced in a variety of cultural contexts, and will explore a range of approaches to defining or circumscribing world literature.

ENGL 595. Topics in English. 1-3 Credits.

The advanced study of selected topics designed to permit small groups of qualified students to work on subjects of mutual interest which, because of their specialized nature, may not be offered regularly. These courses will appear in the course schedule and will be more fully described in information distributed to all academic advisors.

ENGL 596. Topics in English. 1-3 Credits.

The advanced study of selected topics designed to permit small groups of qualified students to work on subjects of mutual interest which, because of their specialized nature, may not be offered regularly. These courses will appear in the course schedule and will be more fully described in information distributed to all academic advisors. Prerequisites: Permission of the instructor.

ENGL 600. Introduction to Research and Criticism. 3 Credits.

Lecture 3 hours; 3 credits. Required of most graduate students in English, usually in the first semester. Survey of English as an academic discipline; issues and trends in scholarly journals; research strategies and conventions for graduate-level papers and master's theses; critical approaches to literature.

ENGL 615. Shakespeare. 3 Credits.

Lecture 3 hours; 3 credits. An application of advanced theoretical and critical approaches to Shakespeare's works. May be repeated more than once for credit if different group of works or themes is being studied.

ENGL 632. 18th Century British Literature. 3 Credits.

Lecture 3 hours; 3 credits. A study of the literature written in the British Isles from the "Glorious Revolution" of 1688 until 1800, focusing on how the flowering of satire and the emergence of literary forms such as periodical journalism, "picturesque" poetry, and the novel interacted with the growth of distinctly modern institutions and philosophies such as a free, commercial press, market capitalism, colonialism, political radicalism, and industrialism.

ENGL 641. 19th Century British Literature. 3 Credits.

Lecture 3 hours; 3 credits. A study of a selection of the literature written in Britain during the romantic and Victorian ages, focusing on the social, historical, and ideological contexts informing its production. Texts analyzed include poetry, fiction, and nonfiction.

ENGL 642. Nineteenth-Century British Novel. 3 Credits.

Lecture 3 hours, 3 credits. A study of 19th Century British novels in context of the economic, social, and political issues of the period, emphasizing their formal and aesthetic concerns.

ENGL 645. 20th Century British Literature. 3 Credits.

Lecture 3 hours; 3 credits. Studies of major poets, dramatists and prose writers. Some attention will be given to the movements, trends, forces, and ideas of the period.

ENGL 650. Creative Writing. 3 Credits.

Guided study and practice in writing short stories, novels, poetry, and creative nonfiction, offered in specific sections of Fiction, Poetry, and Nonfiction. This course can be repeated for credit. Students planning to write a creative thesis must take this course at least twice with their thesis director. Prerequisites: Admission to the MFA program and permission of the instructor.

ENGL 655. Topics in World Literature. 3 Credits.

Lecture 3 hours; 3 credits. Examination of a theme, genre, or other literary topic as it appears in the literature of several countries. All works are assigned in English translation if not originally written in English. Specific topics are listed in the schedule booklet, and course descriptions appear in a booklet distributed to all academic advisors.

ENGL 656. American Literature to 1810. 3 Credits.

Lecture 3 hours; 3 credits. Intensive study of a variety of texts from several genres reflecting the historical forces, aesthetic movements, social trends, and representative works of the period.

ENGL 657. American Literature 1810-1870. 3 Credits.

Lecture 3 hours; 3 credits. Intensive study of a variety of texts from several genres reflecting the historical forces, aesthetic movements, social trends, and representative works of the period.

ENGL 658. American Literature 1870-1946. 3 Credits.

Lecture 3 hours; 3 credits. Intensive study of a variety of texts from several genres reflecting the historical forces, aesthetic movements, social trends, and representative works of the period.

ENGL 659. American Literature 1945-Present. 3 Credits.

Lecture 3 hours; 3 credits. Intensive study of a variety of texts from several genres reflecting the historical forces, aesthetic movements, social trends, and representative works of the period.

ENGL 660. Craft of Narrative. 3 Credits.

A detailed study of the techniques of fiction and nonfiction with some emphasis given to the various theories informing the genres. Prerequisites: Graduate standing and permission of instructor.

ENGL 661. Craft of Poetry. 3 Credits.

A detailed study of the techniques of poetry with some emphasis on the various theories informing the genre. Prerequisites: Graduate standing and permission of instructor.

ENGL 662. Cybercultures and Digital Writing. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: three units of digital writing or instructor's permission. In this course, students will explore the social, theoretical, and cultural implications of composing with the ever-evolving digital writing technologies. They will also consider how to study the practices the writers use to compose with these technologies.

ENGL 664. Teaching College Composition. 3 Credits.

Lecture 3 hours; 3 credits. An intensive examination of alternative approaches to teaching first-year and advanced composition at the college level, with special attention to current schools of composition theory and research.

ENGL 665. Teaching Writing with Technology. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: ENGL 539 and either ENGL 555 or ENGL 664. Students in this course will explore different writing environments and educational applications and learn how they are designed to help writers compose, collaborate, research, and think. Students will assess the values and theoretical assumptions underlying those applications and learn to articulate their own philosophies of using technologies in the writing classroom.

ENGL 668. Graduate Internship and Project in Professional Writing. 1-3 Credits.

3 credits. Prerequisites: 15 graduate credits in English. Structured work experience involving extensive writing and editing in a professional setting. The result of the internship is an analytic paper and a portfolio of written work.

ENGL 670. Methods and Materials in TESOL. 3 Credits.

A practical introduction to methods, materials, and course organization in TESOL (Teaching English to Speakers of Other Languages). The course includes language assessment and teaching language in its cultural context as well as technology-enhanced language teaching.

ENGL 671. Phonology. 3 Credits.

An examination of the sound systems of natural languages, with emphasis on English and how it differs from other languages. The course includes articulatory and acoustic phonetics with analyses of data and exercises in transcription, as well as introduction to different phonological theories and their assumptions and notations. Prerequisites: ENGL 540 or permission of the instructor.

ENGL 672. Syntax. 3 Credits.

A detailed examination of morphosyntactic structures found in the world's languages with an emphasis on English grammar. Prerequisites: ENGL 540 or permission of the instructor.

ENGL 673. Discourse Analysis. 3 Credits.

A survey of approaches to the analysis of spoken discourse. Readings and assignments emphasize issues related to transcription methods, conversational discourse, narrative, social interaction, the influence of prior discourses on texts, and relationships between discourse and power. Prerequisites: ENGL 540 or permission of the instructor.

ENGL 674. Internship in Applied Linguistics. 3 Credits.

A structured work experience involving teaching or work in applied linguistics in a professional setting. To be documented by a portfolio of written work. Prerequisites: 12 graduate credits in linguistics.

ENGL 675. Practicum in TESOL. 3 Credits.

Supervised practice in teaching English to speakers of other languages. Available to those enrolled in the M.A. in Applied Linguistics or TESOL Certificate who have completed core courses. Prerequisites: ENGL 670 and permission of the instructor.

ENGL 676. Semantics. 3 Credits.

This class is an advanced survey of semantic theories and practices. Topics include terminology and taxonomies used in the study of meaning; relationships between linguistic meaning, culture, and cognition (e.g. reference, linguistic relativity, categorization); word meaning; and ways in which contexts of language use influence interpretation. Prerequisites: ENGL 540 or permission of the instructor.

ENGL 677. Language and Communication Across Cultures. 3 Credits.

An investigation of how language and cultural differences affect communication. Readings from linguistics, anthropology, and literature address problems of intercultural communication.

ENGL 678. Sociolinguistics. 3 Credits.

Sociolinguistics is the study of language in its social context with emphasis on ethnography and other qualitative methods, quantitative methods, and linguistic and social differentiation between individuals and groups. Prerequisites: Any upper-division linguistics course or permission of instructor.

ENGL 679. First and Second Language Acquisition. 3 Credits.

An investigation of first and second language acquisition with emphasis on examining evidence about second language learning which supports or fails to support different approaches to teaching a second language.

ENGL 680. Second Language Writing Pedagogy. 3 Credits.

Students engage in many of the theoretical debates about teaching L2 writers, as well as practical responses to these debates. With this knowledge students are prepared to enter the debate, teach L2 writers, and conduct research on L2 writers and writing.

ENGL 681. Contemporary Classics: The Thesis Reading List. 3 Credits.

This course offers students enrolled in the MFA in Creative Writing program the opportunity for rigorous study of contemporary master works in a particular genre. Designed to provide students with the opportunity to deeply investigate contemporary works for the required thesis reading list, this course counts as one of the literature requirements for the MFA degree. The course is best suited for students in the second year of the program; however, any MFA student may register. The course cannot be repeated for credit. Prerequisites: Graduate standing and permission of instructor.

ENGL 683. Literary Editing and Publishing. 3 Credits.

This course is for MFA Creative Writing students, and is meant to provide basic concepts of literary editing and publishing, theoretical and practical frameworks, and hands-on/internship types of experiences managing/reading/editing for the MFA program's literary journal, Barely South Review. This course can count once toward elective credit in the MFA curriculum and may not be repeated for credit. Prerequisites: Students must be in good graduate standing and must have earned at least 9 credit hours in the MFA program. Pre- or corequisite: This course is a corequisite for actual internship work in the journal, though students who take this course are NOT automatically guaranteed a staff position in the journal.

ENGL 685. Writing Research. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisites: 6 graduate credits in English. This course explores current methods and methodologies in writing research. Students will design and carry out original studies of academic, professional, or personal writing as it is practiced in classrooms, work places, and other settings.

ENGL 686. Introduction to Rhetoric and Writing Studies. 3 Credits.

Lecture 3 hours; 3 credits. This course presents key concepts, principles, traditions, and conversations that define the field of rhetoric and composition, surveying major texts, movements, issues, and methodologies. This course is designed primarily to prepare students for advanced courses in professional writing; however, it will also benefit any student who is interested in gaining insights about language, knowledge, and power from the perspective of rhetoric.

ENGL 687. Colloquium for Teachers of English. 3 Credits.

This course discusses theories of teaching, writing and literature and helps explore the challenges facing 21st century educators in terms of finding ways to reach the 21st century student. The course investigates ways to help students understand the inherent value of reading and writing. Additionally, the course looks at pedagogical models and examines how they can be applied to individual areas of expertise. May be repeated for credit when topic varies.

ENGL 694. Thesis Colloquium. 3 Credits.

All MFA students are required to take ENGL 694 before their final semester. The course brings together all genres in a collaborative focus in which students discuss specific thesis projects, format requirements, publishing opportunities and reading lists for the 10-page prefatory essay required for their defense. Prerequisites: May be taken after 24 graduate hours have been completed.

ENGL 695. Topics. 1-3 Credits.

3 credits. The advanced study of a selected topic in English. Topics courses will appear in the course schedule and will be more fully described in information distributed to all academic advisors.

ENGL 696. Independent Readings. 3 Credits.

3 credits. Designed for the advanced student (15-20 hours) who wants to study in-depth a sharply focused area of literature, linguistics, or pedagogy. Before registering for the course, the student must make out a prospectus with the instructor and submit it. No graduate student is permitted to take more than two independent readings courses.

ENGL 698. Thesis Research. 1-9 Credits.

Lecture 1-9 hours; 1-9 credits. Instructor approval required. Prerequisite: Student must have completed 30 hours of course work first. Preparatory course designed to assist students in the writing of a thesis. Students will consult regularly with the faculty.

ENGL 699. Thesis. 3-9 Credits.

Lecture 1-9 hours; 1-9 credits. Instructor approval required. Prerequisite: Student must have completed 30 hours of course work first. Writing of the creative thesis.

ENGL 701. Texts and Technologies. 3 Credits.

Lecture 3 hours; 3 credits. Tracing the development of writing technologies from Ancient Greece through contemporary blogs and wikis, this course focuses on the relationships between a text's physical qualities and its composition, production, and reception.

ENGL 705. Discourse and Rhetoric Across Cultures. 3 Credits.

The course is a survey of language use both within and across cultures. Topics include relationships between language and conceptualization (linguistic relativity); description and interpretation of linguistic and rhetorical patterns; the organization, expression, and analysis of cultural meaning (e.g. frames, cultural models, narratives); relational aspects of language use; and literacy practices. Prerequisites: Admission into the Applied Linguistics M.A. or the Ph.D. in English.

ENGL 706. Visual Rhetoric and Document Design. 3 Credits.

Lecture 3 hours; 3 credits. This course focuses on how visual elements, whether verbal or graphic, work within different types of documents. Theory and research in visual rhetoric and technical communication will be used to develop models for how people process visual information in terms of a variety of social and cultural contexts.

ENGL 710. Major Debates in English Studies. 3 Credits.

Lecture 3 hours; 3 credits. This course introduces students to the principal questions and concerns of the field and includes a comparison and contrast of the subspecialties in English, including how they form and address key issues.

ENGL 715. Professional Writing Theories and Practices. 3 Credits.

Lecture 3 hours; 3 credits. This course surveys the history of professional writing, competing theories and research methodologies in the field. The tensions between workplace practices, professional writing scholarship, and professional writing pedagogy will also be explored.

ENGL 716. International Professional Writing. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: ENGL 715. This course focuses on the linguistic and cultural factors that business writers and technical writers must consider when working with/for global audiences. Students will learn to approach cross-cultural communication as a process that starts with researching the target audience.

ENGL 720. Pedagogy and Instructional Design. 3 Credits.

Lecture 3 hours; 3 credits. Students in this course will be prepared to develop pedagogical plans, teach and assess writing in four instructional areas: advanced and professional writing courses, writing across the curriculum, workplace instruction, and distributed learning. New pedagogical tools, especially computer-based technologies, will be taught, analyzed and tested.

ENGL 721. Compositions as Applied Rhetoric. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: 3 credits of a graduate level rhetoric or composition course or instructor's permission. Students will examine how the field of rhetoric has shaped composition pedagogy in the United States from its inception at Harvard to postmodern possibilities of today's writing classroom.

ENGL 724. Online Writing Instructions. 3 Credits.

Students will learn how to negotiate the intersection between online instruction and writing pedagogy by exploring and interrogating the ways that various means of course mediation shapes the literacy pedagogy an instructor can develop. ENGL 664 is recommended as a prerequisite.

ENGL 725. Scholarly Editing and Textual Scholarship. 3 Credits.

Lecture 3 hours; 3 credits. Instructor approval required. Surveys the theory and practice of scholarly editing, of the physical description of texts as material artifacts, and of the historical and social contextualization of texts as material artifacts. Focus is on texts produced in manuscripts and print, but consideration is given to oral texts and digital texts.

ENGL 730. The Digital Humanities. 3 Credits.

Lecture 3 hours; 3 credits. Taking historical, cultural, and theoretical views, this course bridges literary studies with new media. How has technology historically affected literature and culture? Can the democratization of information accelerate literary development? Topics will include digital archives, intellectual property in the information age, and electronic textuality.

ENGL 735. Postcolonial Literature and Theory. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: Any equivalent graduate level critical theory course or instructor permission. An examination of the discourse of postcolonial critical theory literature produced in postcolonial, diasporic and global contexts.

ENGL 740. Empirical Research Methods and Project Design. 3 Credits.

Lecture 3 hours; 3 credits. This course focuses on the theory and design of empirical research conducted in academic and nonacademic settings. Students will examine the methodological complexities of ethnography, meta-analysis, feminist research and other approaches.

ENGL 750. Service Learning in English Studies. 3 Credits.

Lecture 3 hours; 3 credits. Instructor approval required. Students will engage in service-learning activities and apply various concepts and skills from their experience and coursework to identify and respond to the needs in the community. An analytical paper and portfolio of service-learning materials are required.

ENGL 755. Critical Race Theory. 3 Credits.

Lecture 3 hours; 3 credits. The goal of this course is to examine various approaches to Critical Race Studies and, in light of its theoretical commitments, explore its problems, possibilities, and limitations. How might we better understand our history and contemporary politics through the methodologies of critical race theory? Does critical race theory open up new areas for exploration or does it make our understanding of race and ethnicity more indefinite? Such an exploration will require us to think carefully about race and racism, but also other forms of identity like gender, class, and sexuality.

ENGL 760. Classical Rhetoric and Theory Building. 3 Credits.

Lecture 3 hours; 3 credits. Analysis and discussion of classical theories of rhetoric, with attention to how rhetoric describes discourse in the public sphere.

ENGL 763. Seminar in Discourse Analysis. 3 Credits.

Prerequisites: ENGL 540 or permission of the instructor. This course focuses on relationships among language users, text, grammar, context, and purpose within a discourse perspective. Readings and assignments emphasize theoretical and methodological issues related to interactive discourse, registers and genres, narrative and identity, and language, ideology and power.

ENGL 764. Theories of Literature. 3 Credits.

Lecture 3 hours; 3 credits. An in-depth study of selected theories about the form, history, and cultural significance of literature, such as narrative theory, poststructuralism, Marxism, and feminism. Specific topics may vary by semester, but all sections will engage comprehensively with a body of theoretical texts and concerns.

ENGL 765. Modern Rhetoric and Theory Building. 3 Credits.

Lecture 3 hours; 3 credits. This course concerns the development of rhetoric as an academic discipline in the twentieth century, in particular how rhetoric has distinguished itself from literary, historical, philosophical, and linguistic modes of inquiry.

ENGL 766. New Media Theory and Practice I. 3 Credits.

Lecture 3 hours; 3 credits. This course involves hands-on instruction in a variety of software packages used to create websites and multi-media projects. Students will explore the rhetorical, literary, and technical aspects of their own projects as well as other web-based and multi-media compositions/products.

ENGL 770. Research Methods in Applied Linguistics. 3 Credits.

Prerequisites: Permission of the instructor. This course introduces basic concepts, methods, and techniques used to investigate topics and problems in applied linguistics. Both quantitative and qualitative approaches are presented. Methods include surveys, ethnographies, case studies, and experimental designs. Two major goals are emphasized: to become better readers of research reports and develop research and analytical skills applicable to applied linguistics and related fields.

ENGL 771. New Media Theory and Practice II. 3 Credits.

Lecture 3 hours; 3 hours. Prerequisite: ENG 766. This course builds on the study of new media textual production and consumption in English Studies begun in New Media Theory and Practice I and gives students the opportunity to engage in more advanced theoretical and production work. This course will focus on the integration of multiple modes and media using a variety of software and hardware.

ENGL 775. Seminar in English Studies Pedagogy and Curriculum Design. 3 Credits.

This course introduces students to literacy theory and challenges them to apply it in specific disciplines within English Studies. ENGL 720 or ENGL 820 is recommended as a prerequisite.

ENGL 778. Seminar in Sociolinguistics. 3 Credits.

This seminar investigates socially meaningful language variation. The focus will be on everyday types of speech that people use to situate themselves in social worlds. Topics include ethnography of communication, language ideologies, social and regional variation, and quantitative analysis.

ENGL 783. Seminar in Professional Writing. 3 Credits.

Lecture 3 hours; 3 hours. Prerequisite: Instructor approval. This course will provide an intensive examination of a specific topic or issue in professional writing and serve as a field course for Professional Writing and New Media.

ENGL 790. Seminar in Textual Studies. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: Instructor approval. This course will provide an intensive examination of a specific topic or issue in textual studies and serve as a field course for Rhetoric and Textual Studies.

ENGL 791. Seminar in Literary Studies. 3 Credits.

Intensive seminar in a variable topic within literary or literary/cultural studies.

ENGL 793. Seminar in Rhetoric. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: Instructor approval. This course will provide an intensive examination of a specific topic or issue in rhetoric and serve as a field course for Rhetoric and Textual Studies.

ENGL 794. Seminar in New Media. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: Instructor approval. This course will provide an intensive examination of a specific topic or issue in new media and serve as a field course for Professional Writing and New Media.

ENGL 795. Topics. 3 Credits.

3 credits. Prerequisite: students must be enrolled in a graduate program to take this course. Variable course material for students in PhD in English degree program.

ENGL 797. Independent Study in English. 3 Credits.

Hours to be arranged; 3 credits. Prerequisite: graduate standing. Provides opportunities for doctoral students to do independent research in areas of their interests.

ENGL 801. Texts and Technologies. 3 Credits.

Lecture 3 hours; 3 credits. Tracing the development of writing technologies from Ancient Greece through contemporary blogs and wikis, this course focuses on the relationships between a text's physical qualities and its composition, production, and reception.

ENGL 805. Discourse and Rhetoric Across Cultures. 3 Credits.

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Lecture 3 hours; 3 credits. This course focuses on how visual elements, whether verbal or graphic, work within different types of documents. Theory and research in visual rhetoric and technical communication will be used to develop models for how people process visual information in terms of a variety of social and cultural contexts.

ENGL 810. Major Debates in English Studies. 3 Credits.

Lecture 3 hours; 3 credits. This course introduces students to the principal questions and concerns of the field and includes a comparison and contrast of the subspecialties in English, including how they form and address key issues.

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ENGL 820. Pedagogy and Instructional Design. 3 Credits.

Lecture 3 hours; 3 credits. Students in this course will be prepared to develop pedagogical plans, teach and assess writing in four instructional areas: advanced and professional writing courses, writing across the curriculum, workplace instruction, and distributed learning. New pedagogical tools, especially computer-based technologies, will be taught, analyzed and tested.

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Lecture 3 hours; 3 credits. An in-depth study of selected theories about the form, history, and cultural significance of literature, such as narrative theory, poststructuralism, Marxism, and feminism. Specific topics may vary by semester, but all sections will engage comprehensively with a body of theoretical texts and concerns.

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ENGL 871. New Media Theory and Practice II. 3 Credits.

Lecture 3 hours; 3 hours. Prerequisite: ENG 866. This course builds on the study of new media textual production and consumption in English Studies begun in New Media Theory and Practice I and gives students the opportunity to engage in more advanced theoretical and production work. This course will focus on the integration of multiple modes and media using a variety of software and hardware.

ENGL 875. Seminar in English Studies Pedagogy and Curriculum Design. 3 Credits.

This course introduces students to literacy theory and challenges them to apply it in specific disciplines within English Studies. ENGL 720 or ENGL 820 is recommended as a prerequisite.

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ENGL 883. Seminar in Professional Writing. 3 Credits.

Lecture 3 hours; 3 hours. Prerequisite: Instructor approval. This course will provide an intensive examination of a specific topic or issue in professional writing and serve as a field course for Professional Writing and New Media.

ENGL 890. Seminar in Textual Studies. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: Instructor approval. This course will provide an intensive examination of a specific topic or issue in textual studies and serve as a field course for Rhetoric and Textual Studies.

ENGL 891. Seminar in Literary Studies. 3 Credits.

Intensive seminar in a variable topic within literary or literary/cultural studies. Prerequisites: Student must be enrolled in doctoral program to take this course.

ENGL 892. Dissertation Seminar. 3 Credits.

This course is taken prior to doctoral candidacy exams. It enables students to develop and refine a topic for the dissertation, do preliminary research, and construct a bibliography under the guidance of a faculty mentor. Students will also use the seminar to prepare bibliographies to be used in candidacy exams. Prerequisite: All core, field, and elective coursework must be completed prior to enrollment.

ENGL 893. Seminar in Rhetoric. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: Instructor approval. This course will provide an intensive examination of a specific topic or issue in rhetoric and serve as a field course for Rhetoric and Textual Studies.

ENGL 894. Seminar in New Media. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: Instructor approval. This course will provide an intensive examination of a specific topic or issue in new media and serve as a field course for Professional Writing and New Media.

ENGL 895. Topics. 3 Credits.

3 credits. Prerequisite: students must be enrolled in a graduate program to take this course. Variable course material for students in PhD in English degree program.

ENGL 897. Independent Study in English. 1-3 Credits.

Hours to be arranged; 3 credits. Prerequisite: graduate standing. Provides opportunities for doctoral students to do independent research in areas of their interests.

ENGL 898. Directed Research. 1-9 Credits.

1-9 credits. Prerequisite: instructor approval. This course can be taken as a supplement to the Dissertation Seminar for independent investigation in the topic for dissertation.

ENGL 899. Dissertation. 1-9 Credits.

1-9 credits. Prerequisite: 892 Dissertation Seminar and passing Candidacy examination. This course is to be taken only by students who have passed the candidacy exams for the purpose of researching and writing the dissertation.

ENGL 998. ENGL 998. 1 Credit.**ENGL 999. English 999. 1 Credit.**

1 credit. A one-hour pass/fail registration required of all graduate students to maintain active status during the final semester prior to graduation. After successfully passing the candidacy examination, all doctoral students are required to be registered for at least one graduate credit each term until the degree is complete.

ENGN - Engineering

ENGINEERING Courses

ENGN 554. Introduction to Bioelectrics. 3 Credits.

A one semester course covering the electrical properties of cells and tissues as well as the use of electricity and magnetism in the diagnosis and treatment of disease. Typical topics to be covered include electrocardiography, cardiac pacing, defibrillation, electrotherapy, electroportation, electrotherapy in wound healing. In addition ultrashort electrical pulses for intracellular manipulation and the application of plasmas to biological systems will be covered. (Cross listed with ECE 554). Prerequisites: PHYS 111N or higher; MATH 200 or higher.

ENGN 602T. Engineering for Secondary School Teachers. 1-3 Credits.

An introduction to foundations of design and civil, environmental, electrical, mechanical, and computer engineering. The course will consist of secondary school appropriate content and concepts that directly correlate with the state and local school systems' science and mathematics curriculum. May lead to a Project Lead the Way certification when applicable. Prerequisites: Bachelor's degree or permission of the instructor.

ENGN 603T. Engineering Seminar for Teachers. 1-3 Credits.

An introductory seminar on specific multi-disciplinary or interdisciplinary engineering topics for MS or HS teachers. Prerequisites: Bachelor's degree or permission of the instructor.

ENGN 611. Financial Engineering. 3 Credits.

Financial engineering management, accounting, financial reports and analysis, capital budgeting, investment decisions.

ENGN 612. Analysis of Organizational Systems. 3 Credits.

Introduction to fundamental concepts in the analysis of organizations. Examination of social, structural, procedural, and environmental aspects by systems approach. Modules include: History and systems of organizations and management; Basic organizational systems and models; Organizational behavior models; Integration of systems perspectives; and Organizational structures.

ENGN 622. Remote Sensing. 3 Credits.

The course will cover electromagnetic passive and active sensing systems, earth resource satellite systems, digital image formats, image enhancement, interpretations and applications of computer assisted interpretation in mapping, geology, water quality and urban and regional planning. It also covers image rectification, registration and image data merger with GIS.

ENGN 630. Advanced Bioelectrics. 3 Credits.

A one-semester course covering advanced topics in bioelectrics. The course will cover advanced application of pulsed power and plasma in the medical, biological and environmental fields. (Cross-listed with ECE 630). Prerequisites: bachelor's degree in physics, engineering or biology.

ENGN 671. Carbon-Free Clean Energy. 3 Credits.

Nuclear power and nuclear energy; solar energy; wind energy; geothermal energy; hydroelectric power; hydrogen as energy resource; hydrogen fuel cells; hybrid technologies; global economics and environmental impacts of carbon-free energy.

ENGN 672. Energy Systems Management. 3 Credits.

System management principles; energy systems safety and security; automation and control; environmental effects and comparative risk assessment; energy storage; carbon sequestration; energy systems scale up issues; energy systems integration; hybrid systems; energy systems optimization; effects of public policies on energy systems management.

ENGN 673. Fossil Energy. 3 Credits.

Fossil fuel; global supply and demand; techniques for fossil fuel recovery; technologies for fossil fuel conversion; crude oil characterization and classification, oil refineries, heavy oil shale, tar sand, bitumen; coal characterization, recovery, conversion; natural gas, shale gas, landfill gas, gas hydrates; organic and polymeric wastes; environmental impacts.

ENGN 695. Multidisciplinary Topics in Engineering. 1-3 Credits.

Special interdisciplinary or multidisciplinary topics of interest with emphasis on emerging areas in engineering.

ENGN 697. Independent Study in Energy Engineering. 3 Credits.

Individual analytical, experimental, computational and/or design study selected by the student and supervised by the course instructor.

ENGN 811. Methodologies for Advanced Engineering Projects. 3 Credits.

Critical evaluation of published literature; experimental design and analysis; optimization methods; pre-project planning; definition of scope, projects risks, technical, economical, social, and political constraints; execution strategies; effective proposal development. Prerequisite: Graduate standing.

ENGN 812. Engineering Leadership. 3 Credits.

Effective communication techniques, strategic planning, building collaborative relationships, conflict management, building high-performance teams, risk management, managing innovations. Prerequisites: Graduate standing.

ENGN 813. Engineering Ethics. 3 Credits.

Scope of engineering ethics, moral reasoning and ethical theories, the engineer's responsibility for safety, responsibilities to the employer, responsibilities to the public, rights of engineers, global issues, professional codes of ethics, case studies. Prerequisites: Graduate standing.

ENMA - Engineering Management

ENGINEERING MANAGEMENT Courses

ENMA 510. Agile Project Management. 3 Credits.

This course focuses the management of projects using an agile approach to respond to the continuous changes that affect project capabilities and performance. Although any project can be managed using agile project management, projects with high degree of uncertainty obtain the most benefits from this approach (e.g., R&D projects). The course covers Scrum and expands it by articulating the human and business factors that make successful agile project management. Case studies and/or short-projects are required. Prerequisites: ENMA 401 or equivalent.

ENMA 515. Introduction to Systems Engineering. 3 Credits.

Introduces the principles, concepts and process of systems engineering. Examination of problem formulation, analysis, and interpretation as they apply to the study of complex systems. Emphasizes the design nature of systems engineering problem solving, and includes case studies stressing realistic problems. Development of system requirements, system objectives, and the evaluation of system alternatives.

ENMA 520. Statistical Concepts in Engineering Management. 3 Credits.

Introduction to concepts and tools in probability and statistics with applications to engineering design, systems analysis, manufacturing, and quality management problems.

ENMA 600. Cost Estimating and Financial Analysis. 3 Credits.

Introduction to the monetary aspects of engineering projects, including accounting principles; financial reports and analysis; capital budgeting; cost estimation and control; inventory management; depreciation; investment decisions. Knowledge of probability and statistics (ENMA 520 or equivalent) is assumed. Case studies and a term project are required. Pre- or corequisite: ENMA 420/ENMA 520 or equivalent.

ENMA 601. Analysis of Organizational Systems. 3 Credits.

This course introduces the student to fundamental concepts in the analysis of organizations. A systems approach is taken in the examination of social, structural, procedural and environmental aspects that are of consequence to technical professionals and managers. Modules covered include: History and Systems of Organizations and Management; Basic Organizational Systems and Models emphasizing rational, natural and open systems; Organizational Behavior Models; Organizational Structure Models; Integration of Systems Perspectives.

ENMA 602. Systems Engineering Management. 3 Credits.

Students develop a comprehensive set of techniques and methods to design, maintain and evolve the systems engineering function in support of strategic enterprise objectives and operations.

ENMA 603. Operations Research. 3 Credits.

Deterministic and stochastic models for decision making. Topics include: optimization methods; linear and other programming models; network analysis; inventory analysis; queuing theory. Knowledge of probability and statistics (ENMA 520 or equivalent) is assumed.

ENMA 604. Project Management. 3 Credits.

Exploration of the systems approach to planning, scheduling, control, design, evaluation, and leadership of projects in technology-based organizations. The fundamental tools and techniques of project management; role of the project manager; project management systems; project selection; project life cycle; project monitoring and control; project management evaluation and auditing; project risk and failure analysis; contextual nature of project management; project knowledge.

ENMA 605. Program Capstone. 1 Credit.

Comprehensive demonstration of the ME or MEM candidate's competence in the fields covered by the program of study. Written submission is required, intended to fulfill the non-thesis Master's Examination requirement. Prerequisites: Completion of minimum of the 18 core credit hours in program of study.

ENMA 606. Engineering Law. 3 Credits.

Basic legal concepts and procedures for understanding the implications of engineering management decisions. Major emphasis on contracts and liability.

ENMA 607. Stochastic Decision Methods. 3 Credits.

Introduction to decision analysis and stochastic models; risk and uncertainty in decision making; probabilistic inventory problems; queuing theory; Markov processes; dynamic programming; Monte Carlo simulation of dynamic systems. Knowledge of probability and statistics (ENMA 520 or equivalent) is assumed.

ENMA 613. Logistics and Supply Chain Management. 3 Credits.

Lecture 3 hours; 3 credits. Studying how logistical decisions impact the performance of the firm and the entire supply chain. Topics include strategic planning, facilities location and analysis, distribution and transportation networks, forecasting, inventory management, and information systems for supply chains. Knowledge of probability and statistics (ENMA 520 or equivalent) is assumed. The course includes case studies and/or a project. Prerequisites: ENMA 603; ENMA 420/ENMA 520 or equivalent.

ENMA 614. Quality Systems Design. 3 Credits.

Integrated analysis of the process quality assurance and improvement function. Quality Deming's way. Scientific sampling and control charting for quality assurance and control; the quality cost concept and economic aspects of quality decisions. Organization of the quality function for process quality improvement. Knowledge of probability and statistics (ENMA 520 or equivalent) is assumed. Prerequisites: ENMA 420/ENMA 520 or equivalent.

ENMA 616. The Entrepreneurial Engineering Manager. 3 Credits.

Globalization has increased competition among the planet's enterprises. The quality of products and services has dramatically improved while prices have plummeted. Consumer expectations have risen to very high levels. This phenomenon has accelerated the need for large technical enterprises to become more agile, flexible and responsive to consumer demands. Government agencies are not exempt from this trend: U.S. Government agencies are now required to establish strategic plans for their enterprises and to develop business plans that illustrate the future directions of the enterprise and to define the resources required to realize the vision and strategy of the enterprise. This course introduces Engineering Management students to a wide range of approaches designed to facilitate start-up, enable growth and ensure the continued capability of emerging and mature technical enterprises.

ENMA 640. Integrated Systems Engineering I. 3 Credits.

This course examines the role and nature of systems engineering. It is specifically designed to provide the fundamental understanding of systems engineering and complex systems. This course examines a variety of systems engineering topics with emphasis on the: (1) development of the fundamentals of systems engineering, (2) systems engineering life-cycle models and phases, (3) systems design for operational feasibility, and (4) an introduction to planning for systems engineering and management. This course prepares students to assume the role of a systems engineer in planning, directing, conducting, and assessing systems engineering initiatives.

ENMA 641. Requirements Management, Verification and Validation. 3 Credits.

Comprehensive treatment of the nature and utility of requirements, verification, and validation in systems engineering processes. Topics include: establishing user requirements; traceability; baseline and evolving requirements; governing standards; requirements management; issues in requirements for complex systems; role and methods for verification and validation in systems engineering; data treatment and analysis; standards, practices, and issues for verification and validation in systems engineering.

ENMA 660. Systems Architecture and Modeling. 3 Credits.

Students learn the essential aspects of the systems architecture paradigm through development and analysis of multiple architecture frameworks and enterprise engineering. Emphasis is placed on systems modeling and enterprise engineering.

ENMA 667. Cooperative Education. 1-3 Credits.

Available for pass/fail grading only. Student participation for credit based on academic relevance of the work experience, criteria, and evaluative procedures as formally determined by the department and the Cooperative Education program prior to the semester in which the work experience is to take place.

ENMA 668. Internship. 1-3 Credits.

Academic requirements will be established by the graduate program director and will vary with the amount of credit desired. Allows students an opportunity to gain short-duration career-related experience. Meant to be used for one-time experience. Work may or may not be paid. Project is completed during the term.

ENMA 669. Practicum. 1-3 Credits.

Academic requirements will be established by the department and will vary with the amount of credit desired. Allows students an opportunity to gain short duration career related experience. Student is usually already employed - this is an additional project in the organization. Prerequisites: Approval by department and Career Management.

ENMA 670. Cyber Systems Engineering. 3 Credits.

This course provides an overview of functioning of cyber systems including how a computer interacts with the outside world. The composition of critical infrastructure and functioning of different engineered systems that form critical infrastructure are discussed. Mutual dependence and interactions between cyber systems and other engineered and the resulting security risks are also explored. Prerequisites: Undergraduate students in STEM fields or graduate students of STEM degree or instructor's approval.

ENMA 671. Knowledge Management and Decision Making. 3 Credits.

This course focuses on the interrelationships between knowledge management and decision making. The course emphasizes the contributions of knowledge management in the decision making process and outcomes. The course describes the relationship of knowledge management with naturalistic decision making, robust decision making, and risk management. Case studies and/or short-projects are required.

ENMA 672. Fundamentals of Knowledge Management. 3 Credits.

This course focuses on the concept of knowledge management, its basics and advanced processes and methods. Knowledge transfer, knowledge elicitation, knowledge creation, and knowledge representation are some of the knowledge processes covered. The course describes the relationship of knowledge management with innovation and organizational learning. Case studies and/or short-projects are required.

ENMA 673. Threat Modeling and Risk Analysis. 3 Credits.

This course discusses how to develop cyber threat models using attack graphs/trees, STRIDE, Universal Modeling Language (UML), attack graphs/trees and common of risk analysis tools. Course also discusses the need for quantitative security analysis and formal validation of security models and basic principles of formal model validation. Prerequisites: ENMA 670 or MSIM 670 and MSIM 672; undergraduate students in STEM fields or graduate students of STEM degree or instructor's approval.

ENMA 690. Preparation Seminar for Systems Engineering Certification. 1 Credit.

A comprehensive treatment and review of systems engineering in preparation for the International Council for Systems Engineering (INCOSE) systems engineering certification. Students may elect this course to fulfill their program capstone requirement. Registration for the systems engineering certification examination is required for successful completion of this course. (The certification exam registration fee is not covered as a part of this course.)

ENMA 695. Topics in Engineering Management. 1-3 Credits.

Special topics of interest with emphasis placed on recent developments in engineering management. Prerequisites: Permission of the instructor.

ENMA 696. Topics in Engineering Management. 1-3 Credits.

Special topics of interest with emphasis placed on recent developments in engineering management. Prerequisites: Permission of the instructor.

ENMA 697. Independent Study in Engineering Management. 3 Credits.

Individual study selected by the student. Supervised and approved by a faculty member with the approval of the Graduate Program Director. Prerequisites: Permission of Graduate Program Director.

ENMA 698. Master's Project. 1-3 Credits.

The master's project is guided under the supervision of the course instructor. Projects must be approved by the Graduate Program Advisor. Prerequisites: Graduate Program Director permission is required.

ENMA 699. Thesis. 1-6 Credits.

Research leading to a Master of Science thesis. Prerequisites: ENMA 721 and permission of the Graduate Program Director.

ENMA 700. Economic Analysis of Capital Projects. 3 Credits.

This course is targeted at engineering managers who actively participate in the capital budgeting process and project justification. Topics include capital budgeting techniques (including multi-attribute decision making), utility theory, justification of new technologies, and current research in engineering economics. Reading and application of current research in the field is stressed. Case studies are used. Oral presentations and term project required. Prerequisites: ENMA 600.

ENMA 702. Methods for Rational Decision Making. 3 Credits.

The goal of this course is to enhance the student's ability to make rational and strategic decisions in complex situations. The course is split in two modules: decision theory and game theory. The decision theory module focuses on how individuals make complex decisions, both from a prescriptive (ideal) and descriptive (actual) perspective. The game theory module focuses on strategic decision-making in situations where individuals must interact with one another.

ENMA 703. Optimization Methods. 3 Credits.

Covers advanced methods in Operations Research and Optimization. Focus will be on developing models and their applications in different domains including manufacturing and service. Modern optimization tools will be used to implement models for case studies, projects and research papers. The knowledge of programming and spreadsheets is expected. Contact instructor for more details.

ENMA 704. Design of Project Knowledge Systems. 3 Credits.

Graduate level research colloquium examining the application of a systems perspective to design, operation, analysis, and evaluation of project knowledge systems. Special emphasis will be placed on knowledge generation and generalization systems. Case studies, problems, and a course project.

ENMA 705. Financial Engineering. 3 Credits.

This course covers concepts in complex investments, how to deal with uncertainty in today's global markets, and how to engineer and manage financial decisions. The main topics include: cash flows, portfolio theory, capital management, securities, hedge funds, optimal investment and financial engineering evaluations among others.

ENMA 710. Modeling and Analysis of Systems. 3 Credits.

Probability and statistics (or an equivalent course). Covers modern modeling paradigms for deterministic and stochastic complex and dynamic systems. This includes, but not limited to, Discrete Simulation, Queuing Systems, and Agent-based models among others. Great focus will be on system analysis using different developed models in different domains such as production, logistics, security, and service, military and social. The course entails up to two exams, multiple case studies, individual and group projects and research papers. Prerequisites: ENMA 420/ENMA 520 or equivalent.

ENMA 711. Methodology for Advanced Engineering Projects. 3 Credits.

The course covers general topics that are necessary for project execution. This includes problem scoping, data collection, hypothesis formulation and testing, experimentation, testing and evaluation, qualitative analysis, quantitative analysis, and validation methods.

ENMA 712. Multi-Criteria Decision Analysis and Decision Support Systems. 3 Credits.

Currently, complex engineering-economic-societal decisions are made by involving numerous sometimes conflicting criteria and attributes, different decision rules and in the presence of various stakeholders with individual preferences who are willing to go into negotiation procedures. A number of multi-criteria decisions tools involving quantitative as well as qualitative methods, together with adequate decision support tools will be introduced. Case studies on a variety of engineering, environmental and security related aspects will also be considered.

ENMA 713. Integrating Ethics and Engineering Management. 3 Credits.

This course is designed to expose prospective engineering managers to the theories and practices that are inherent in the ethical environment of modern organizations. Topics include definitions of ethical behavior and leadership, moral decision-making, the importance of values such as honesty, integrity, and trustworthiness. A full exploration of ethical autonomy, collaboration, communication and moral imagination will be conducted. A variety of methods will be used to facilitate learning, including a textbook, regular journaling, movies and videos, case studies, small work group activities, experiential activities and writing assignments. The successful student should gain a full understanding of the requirements for and the practice of ethical leadership and should be able to determine how to create and maintain a work environment that fosters openness and clear communication about issues and problems.

ENMA 714. Crisis Project Management. 3 Credits.

Graduate-level research colloquium examining the existing and potential role of project management approaches and analysis procedures in the handling of crisis-related activities. Emphasis will be placed on the management of organizational level processes and activities related to crisis preparation, handling and recovery. Case studies, problems and reports.

ENMA 715. Systems Analysis. 3 Credits.

The course is designed to provide an understanding of the interdisciplinary aspects of systems development, operation, and support. The course focuses on the application of scientific and engineering efforts to transform an operational need into a defined system configuration through the interactive process of design, test, and evaluation.

ENMA 716. Complex Adaptive Situations Environment. 3 Credits.

The course focuses on the manner in which information, knowledge, and awareness are processed to facilitate decision making, management and engineering in complex adaptive situations. Topics include: knowledge acquisition, formation of technical and contextual awareness, and the role of understanding.

ENMA 717. Cost Engineering. 3 Credits.

Introduction to parametric cost modeling techniques and methodologies; generation and application of statistical relationships between life cycle costs and measurable attributes of complex systems; sources of supporting data; quality function deployment; technology forecasting. Special emphasis on life cycle design for cost; cost risk analysis; and design optimization on cost bases. Case studies and a semester project.

ENMA 721. Foundations of Research. 3 Credits.

This course is intended to prepare students to undertake substantiated, rigorous, scholarly research, particularly theses or dissertations. The course will focus on the approaches necessary to integrate research intent, techniques and constraints. A variety of research approaches will be investigated. Emphasis on problem formulation, literature review, proposal preparation, oral presentation, experimentation and accepted canons of research. Knowledge of probability and statistics (ENMA 420/ENMA 520 or equivalent) is assumed. Research paper required. Prerequisites: ENMA 420/ENMA 520 or equivalent.

ENMA 723. Enterprise and Complex System Dynamics. 3 Credits.

The use of system dynamics modeling and simulation in various enterprise and complex system application areas. Topics include: complex and hierarchical system dynamics, tools for systems thinking, the dynamics of growth, modeling and simulation tools, and model development, use and analysis.

ENMA 724. Risk Analysis. 3 Credits.

Approaches to the management of risk; probability assessment methods; risk modeling; use of software packages; extensions of decision analysis, including stochastic dominance and multiattribute methods; applications to project management, scheduling, and cost estimation.

ENMA 727. Engineering Management and Technology. 3 Credits.**ENMA 735. Team Performance and Decision Making in Engineering. 3 Credits.**

This course explores and models the use of teams in organizations with a specific focus on the role of teams in decision making and problem solving. Key areas include team building, assessment of team outcomes, team learning, virtual teams and team decision making. Actual work on teams is required including team deliverables.

ENMA 742. Knowledge Management and Information Technology. 3 Credits.

This course focuses on the enabling nature of communication and information technologies in managing knowledge. The course describes the relationship of knowledge management with library science and content management, network security, data mining, and database management. Case studies and/or short-projects are required.

ENMA 743. Reliability and Maintainability. 3 Credits.

Introduction to the theory and practice of reliability engineering, maintainability and availability. Reliability evaluation models and techniques; failure data collection and analysis; reliability testing and modeling; maintained systems; mechanical system reliability. Semester project. Prerequisites: ENMA 420/ENMA 520 or equivalent.

ENMA 744. Human Aspects of Knowledge Management. 3 Credits.

This course focuses on the enabling nature of the individual, group, and organization factors in the management of knowledge. Performance metrics, team processes, and work structure are some of the topics covered in this course at the individual, group, and organization levels. The course describes the relationship of knowledge management with organizational behavior, change management, agile project management. Case studies and/or short-projects are required.

ENMA 750. System of Systems Engineering. 3 Credits.

Comprehensive treatment of System of Systems Engineering (SoSE), including; fundamental systems principles, concepts, and governing laws; complex and simple systems; underlying paradigms, methodologies and essential methods for SoSE analysis, design, and transformation; complex system transformation; current state of SoSE research and application challenges. Explores the range of technological, human/social, organizational/managerial, policy, and political dimensions of the SoSE problem domain.

ENMA 751. Complexity, Engineering and Management. 3 Credits.

This course examines management and engineering of complex systems as it is undertaken in complex situations. The student will develop an understanding of the unconditional attributes of complex systems and situations that become foundational in the development of robust methods to deal with the practical reality of working in dynamic, uncertain environments. Topics will include Complexity, Complex Systems, Complex Adaptive Systems, Complex Responsive Processes, Complex Adaptive Situations Methodology, SOSE, Reciprocity, and Sociotechnical Systems.

ENMA 752. Agent-Directed Simulation and Systems Engineering. 3 Credits.

The student will learn about methods and tools for agent-directed simulation in support of systems engineering as well as applications of systems engineering for the development of complex agent-directed simulation applications. Students should have knowledge of principles of systems engineering, modeling and simulation, and a higher programming language prior to registering.

ENMA 755. Human System Engineering. 3 Credits.

This course introduces concepts of Human System Engineering, focusing on designing systems that include human components. Human System Integration and Human Factors Engineering are discussed, as well as other human centered design approaches. The role of human data in systems and systems of systems design is explored, and methods to capture and represent human data, including architecture frameworks, are presented. Modeling and analysis of human centered systems is done through hands-on projects.

ENMA 763. Robust Engineering Design. 3 Credits.

Robust design approach based on "Taguchi Methods." Off-line quality engineering and applied design-of-experiments methods; full factorial and fractional factorial designs; response surface methods. The course is designed to enable engineers and engineering managers from all disciplines to recognize potential applications, formulate problems, plan experiments, and analyze data. Knowledge of probability and statistics (ENMA 420/ENMA 520 or equivalent) is assumed. Case studies. Semester project. Prerequisites: ENMA 420/ENMA 520 or equivalent.

ENMA 771. Risk and Vulnerability Management of Complex Interdependent Systems. 3 Credits.

Seminar discussions and team projects. A systematic approach to basic principles of design, economics and management of critical infrastructure systems, including issues of risk, vulnerability and risk governance. Development of advanced methodologies, e.g. system of systems, by use of complexity analysis, dynamic/chaotic behavior, threat analysis, resilient design and management under normal and stress conditions. Adopting an agent based modeling approach under conditions of uncertainty, dysfunctionality, malicious attacks and/or presence of natural perils.

ENMA 776. Engineering Principles of Combat Modeling and Distributed Simulation. 3 Credits.

Prerequisites: ENMA 710, MSIM 601, or equivalent. This course introduces students to the engineering principles of model movement, effects, sensors, and command and control of military operations. An overview of standards for distributed simulation enabling global federations is provided as well as challenges of interoperability, composability, and integrability in C2 systems. Technical solutions are addressed.

ENMA 780. Leadership for Engineering Managers. 3 Credits.

Seminar discussions and team projects. This course is designed to expose students to the concepts, skills, characteristics and emotional composition of effective and successful leaders in the 21st century. The course is intensive and requires students to immerse themselves in the course material and classroom discussion to derive meaning and value from the topics. The course objectives will be achieved by classroom discussion of the assigned material, candid self-assessment, experimental exercises and analysis of the actions of leaders, as described in case studies and literature. Areas of exploration include the fundamentals of leadership, ethical leadership, social capital, emotional intelligence and three-dimensional leadership. Prerequisites: ENMA 601 or Ph.D. status.

ENMA 795. Topics in Engineering Management. 3 Credits.

Special topics of interest with emphasis placed on recent developments in engineering management.

ENMA 796. Topics in Engineering Management. 3 Credits.

Special topics of interest with emphasis placed on recent developments in engineering management.

ENMA 797. Independent Study in Engineering Management. 1-3 Credits.

Designed for advanced individualized study into an engineering management topic area. Independent study projects will be related to engineering management and completed under the supervision of a certified faculty member. Prerequisites: Permission of the instructor and Graduate Program Director.

ENMA 800. Economic Analysis of Capital Projects. 3 Credits.

It is targeted at engineering managers who actively participate in the capital budgeting process and project justification. Topics include capital budgeting techniques (including multi-attribute decision making), utility theory, justification of new technologies, and current research in engineering economics. Reading and application of current research in the field is stressed. Case studies are used. Oral presentations and term project required. Prerequisites: ENMA 600.

ENMA 802. Methods for Rational Decision Making. 3 Credits.

The goal of this course is to enhance the student's ability to make rational and strategic decisions in complex situations. The course is split in two modules: decision theory and game theory. The decision theory module focuses on how individuals make complex decisions, both from a prescriptive (ideal) and descriptive (actual) perspective. The game theory module focuses on strategic decision-making in situations where individuals must interact with one another.

ENMA 803. Optimization Methods. 3 Credits.

Covers advanced methods in Operations Research and Optimization. Focus will be on developing models and their applications in different domains including manufacturing and service. Modern optimization tools will be used to implement models for case studies, projects and research papers. The knowledge of programming and spreadsheets is expected. Contact instructor for more details.

ENMA 804. Design of Project Knowledge Systems. 3 Credits.

Graduate level research colloquium examining the application of a systems perspective to design, operation, analysis, and evaluation of project knowledge systems. Special emphasis will be placed on knowledge generation and generalization systems. Case studies, problems, and a course project.

ENMA 805. Financial Engineering. 3 Credits.

This course covers concepts in complex investments, how to deal with uncertainty in today's global markets, and how to engineer and manage financial decisions. The main topics include: cash flows, portfolio theory, capital management, securities, hedge funds, optimal investment and financial engineering evaluations among others.

ENMA 810. Modeling and Analysis of Systems. 3 Credits.

Covers modern modeling paradigms for deterministic and stochastic complex and dynamic systems. This includes, but not limited to, Discrete Simulation, Queuing Systems, and Agent-based models among others. Great focus will be on system analysis using different developed models in different domains such as production, logistics, security, and service, military and social. The course entails up to two exams, multiple case studies, individual and group projects and research papers. Prerequisites: ENMA 420/ENMA 520 or equivalent.

ENMA 811. Methodology for Advanced Engineering Projects. 3 Credits.

The course covers general topics that are necessary for project execution. This includes problem scoping, data collection, hypothesis formulation and testing, experimentation, testing and evaluation, qualitative analysis, quantitative analysis, and validation methods.

ENMA 812. Multi-Criteria Decision Analysis and Decision Support Systems. 3 Credits.

Currently, complex engineering-economic-societal decisions are made by involving numerous sometimes conflicting criteria and attributes, different decision rules and in the presence of various stakeholders with individual preferences who are willing to go into negotiation procedures. A number of multi-criteria decisions tools involving quantitative as well as qualitative methods, together with adequate decision support tools will be introduced. Case studies on a variety of engineering, environmental and security related aspects will also be considered.

ENMA 813. Integrating Ethics and Engineering Management. 3 Credits.

This course is designed to expose prospective engineering managers to the theories and practices that are inherent in the ethical environment of modern organizations. Topics include definitions of ethical behavior and leadership, moral decision-making, the importance of values such as honesty, integrity, and trustworthiness. A full exploration of ethical autonomy, collaboration, communication and moral imagination will be conducted. A variety of methods will be used to facilitate learning, including a textbook, regular journaling, movies and videos, case studies, small work group activities, experiential activities and writing assignments. The successful student should gain a full understanding of the requirements for and the practice of ethical leadership and should be able to determine how to create and maintain a work environment that fosters openness and clear communication about issues and problems.

ENMA 814. Crisis Project Management. 3 Credits.

Graduate-level research colloquium examining the existing and potential role of project management approaches and analysis procedures in the handling of crisis-related activities. Emphasis will be placed on the management of organizational level processes and activities related to crisis preparation, handling and recovery. Case studies, problems and reports.

ENMA 815. Systems Analysis. 3 Credits.

The course is designed to provide an understanding of the interdisciplinary aspects of systems development, operation, and support. The course focuses on the application of scientific and engineering efforts to transform an operational need into a defined system configuration through the interactive process of design, test, and evaluation.

ENMA 816. Complex Adaptive Situations Environment. 3 Credits.

The course focuses on the manner in which information, knowledge, and awareness are processed to facilitate decision making, management and engineering in complex adaptive situations. Topics include: knowledge acquisition, formation of technical and contextual awareness, and the role of understanding.

ENMA 817. Cost Engineering. 3 Credits.

Introduction to parametric cost modeling techniques and methodologies; generation and application of statistical relationships between life cycle costs and measurable attributes of complex systems; sources of supporting data; quality function deployment; technology forecasting. Special emphasis on life cycle design for cost; cost risk analysis; and design optimization on cost bases. Case studies and a semester project.

ENMA 821. Foundations of Research. 3 Credits.

This course is intended to prepare students to undertake substantiated, rigorous, scholarly research, particularly theses or dissertations. The course will focus on the approaches necessary to integrate research intent, techniques and constraints. A variety of research approaches will be investigated. Emphasis on problem formulation, literature review, proposal preparation, oral presentation, experimentation and accepted canons of research. Research paper required. Prerequisites: ENMA 420/ENMA 520 or equivalent.

ENMA 823. Enterprise and Complex System Dynamics. 3 Credits.

The use of system dynamics modeling and simulation in various enterprise and complex system application areas. Topics include: complex and hierarchical system dynamics, tools for systems thinking, the dynamics of growth, modeling and simulation tools, and model development, use and analysis.

ENMA 824. Risk Analysis. 3 Credits.

Approaches to the management of risk; probability assessment methods; risk modeling; use of software packages; extensions of decision analysis, including stochastic dominance and multiattribute methods; applications to project management, scheduling, and cost estimation.

ENMA 827. Engineering Management and Technology. 3 Credits.

ENMA 835. Team Performance and Decision Making in Engineering. 3 Credits.

This course explores and models the use of teams in organizations with a specific focus on the role of teams in decision making and problem solving. Key areas include team building, assessment of team outcomes, team learning, virtual teams and team decision making. Actual work on teams is required including team deliverables.

ENMA 843. Reliability and Maintainability. 3 Credits.

Introduction to the theory and practice of reliability engineering, maintainability and availability. Reliability evaluation models and techniques; failure data collection and analysis; reliability testing and modeling; maintained systems; mechanical system reliability. Semester project. Prerequisites: ENMA 420/ENMA 520 or equivalent.

ENMA 850. System of Systems Engineering. 3 Credits.

Comprehensive treatment of System of Systems Engineering (SoSE), including; fundamental systems principles, concepts, and governing laws; complex and simple systems; underlying paradigms, methodologies and essential methods for SoSE analysis, design, and transformation; complex system transformation; current state of SoSE research and application challenges. Explores the range of technological, human/social, organizational/managerial, policy, and political dimensions of the SoSE problem domain.

ENMA 851. Complexity, Engineering and Management. 3 Credits.

This course examines management and engineering of complex systems as it is undertaken in complex situations. The student will develop an understanding of the unconditional attributes of complex systems and situations that become foundational in the development of robust methods to deal with the practical reality of working in dynamic, uncertain environments. Topics will include Complexity, Complex Systems, Complex Adaptive Systems, Complex Responsive Processes, Complex Adaptive Situations Methodology, SOSE, Reciprocity, and Sociotechnical Systems.

ENMA 852. Agent-Directed Simulation and Systems Engineering. 3 Credits.

The student will learn about methods and tools for agent-directed simulation in support of systems engineering as well as applications of systems engineering for the development of complex agent-directed simulation applications. Students should have knowledge of principles of systems engineering, modeling and simulation, and a higher programming language prior to registering.

ENMA 855. Human System Engineering. 3 Credits.

This course introduces concepts of Human System Engineering, focusing on designing systems that include human components. Human System Integration and Human Factors Engineering are discussed, as well as other human centered design approaches. The role of human data in systems and systems of systems design is explored, and methods to capture and represent human data, including architecture frameworks, are presented. Modeling and analysis of human centered systems is done through hands-on projects.

ENMA 863. Robust Engineering Design. 3 Credits.

Robust design approach based on "Taguchi Methods." Off-line quality engineering and applied design-of-experiments methods; full factorial and fractional factorial designs; response surface methods. The course is designed to enable engineers and engineering managers from all disciplines to recognize potential applications, formulate problems, plan experiments, and analyze data. Case studies. Semester project. Prerequisites: ENMA 420/ENMA 520 or equivalent.

ENMA 871. Risk and Vulnerability Management of Complex Interdependent Systems. 3 Credits.

Prerequisites: Permission of the instructor. Seminar discussions and team projects. A systematic approach to basic principles of design, economics and management of critical infrastructure systems, including issues of risk, vulnerability and risk governance. Development of advanced methodologies, e.g. system of systems, by use of complexity analysis, dynamic/chaotic behavior, threat analysis, resilient design and management under normal and stress conditions. Adopting an agent based modeling approach under conditions of uncertainty, dysfunctionality, malicious attacks and/or presence of natural perils.

ENMA 876. Engineering Principles of Combat Modeling and Distributed Simulation. 3 Credits.

Prerequisites: ENMA 710, MSIM 601, or equivalent. This course introduces students to the engineering principles of model movement, effects, sensors, and command and control of military operations. An overview of standards for distributed simulation enabling global federations is provided as well as challenges of interoperability, composability, and integratability in C2 systems. Technical solutions are addressed.

ENMA 880. Leadership for Engineering Managers. 3 Credits.

Seminar discussions and team projects. This course is designed to expose students to the concepts, skills, characteristics and emotional composition of effective and successful leaders in the 21st century. The course is intensive and requires students to immerse themselves in the course material and classroom discussion to derive meaning and value from the topics. The course objectives will be achieved by classroom discussion of the assigned material, candid self-assessment, experimental exercises and analysis of the actions of leaders, as described in case studies and literature. Areas of exploration include the fundamentals of leadership, ethical leadership, social capital, emotional intelligence and three-dimensional leadership. Prerequisites: ENMA 601 or Ph.D. standing.

ENMA 888. Ph.D. Seminar. 1 Credit.

Discussion of research projects, topics, and problems of Engineering Management faculty, researchers, and students. A weekly exchange of ideas and issues between faculty and Ph.D. students focused on doctoral research.

ENMA 892. Doctor of Engineering Project. 1-12 Credits.

Directed individual study applying advanced-level technical knowledge to identify, formulate, and solve a complex, novel problem in Engineering Management.

ENMA 895. Topics in Engineering Management. 3 Credits.

Special topics of interest with emphasis placed on recent developments in engineering management.

ENMA 896. Topics in Engineering Management. 3 Credits.

Special topics of interest with emphasis placed on recent developments in engineering management.

ENMA 897. Independent Study in Engineering Management. 1-3 Credits.

Designed for advanced individualized study into an engineering management topic area. Independent study projects will be related to engineering management and completed under the supervision of a certified faculty member. Prerequisites: Permission of the instructor and Graduate Program Director.

ENMA 898. Research in Engineering Management. 1-12 Credits.

Supervised research prior to passing Ph.D. candidacy exam. Prerequisites: ENMA 721/ENMA 821 and permission of Graduate Program Director.

ENMA 899. Doctoral Research. 1-12 Credits.

Doctoral research hours. After successfully passing the candidacy examination, all doctoral students are required to be registered for at least one graduate credit each term until the degree is complete. Prerequisites: ENMA 821 and permission of instructor.

ENMA 999. Engineering Management 999. 1 Credit.

A one-hour pass/fail registration required of all graduate students to maintain active status during the final semester prior to graduation. After successfully passing the candidacy examination, all doctoral students are required to be registered for at least one graduate credit each term until the degree is complete.

ENVH - Environmental Health

ENVIRONMENTAL HEALTH Courses

ENVH 501. Occupational Health. 3 Credits.

An introduction to the industrial environment relative to health problems and the etiologically related agents.

ENVH 502. Environmental Health Administration and Law. 3 Credits.

A review of the concepts and practice of administering environmental health control programs within agencies at the federal, state and local levels. The principles of administration and leadership of programs in the private sector are also discussed. The constitutional, statutory and administrative law bases for organizing and conducting such programs and developing environmental policy as well as the legal implications of enforcement will be addressed. A review of all major environmental statutes and their agencies that enforce them will be addressed. (This is a writing intensive course.)

ENVH 506. Principles of Occupational Safety and Health. 3 Credits.

A broad overview of the field of safety. A study of the factors influencing the occurrence of accidents and incidents is set in the context of safety legislation, current issues in the practice of safety and the ethical and professional responsibilities of the safety practitioner. The course also includes discussions of product safety, fire prevention and protection systems safety and human elements in loss prevention.

ENVH 507. Occupational Safety Standards, Laws and Regulations. 3 Credits.

A review of the important Occupational Safety and Health Standards and Codes with particular emphasis on application of these codes to typical work situations. Governmental enforcement methodologies are also discussed.

ENVH 520. Communicable Diseases and Their Control. 3 Credits.

An in-depth study of the communicable disease processes as they pertain to environmental sources. A detailed discussion of specific communicable diseases that are manifested by various environmental etiologic agents. Various environmental control measures to prevent the incidence of communicable diseases are presented.

ENVH 521. Food Safety. 3 Credits.

A comprehensive study of food and milk production, processing and preservation and controls exercised for the prevention of foodborne illnesses and spoilage.

ENVH 522. Water and Wastewater Technology. 3 Credits.

Introduction to water quality management and wastewater treatment technology. Topics include the effect of organic, inorganic and thermal pollutants in water quality streams, waterborne diseases, monitoring concepts, methods of water quality management, regulatory considerations, theory and application of wastewater treatment concepts, wastewater characterization, and treatment methods and disposal methods.

ENVH 523. Vector Control. 3 Credits.

A study of the vectors of human disease and the methods utilized in their control. (offered spring).

ENVH 524. Residential and Institutional Environments. 3 Credits.

A study of the physical aspects of housing and institutions as they relate to human health and well-being. Coverage is also given to infection control in health-care facilities.

ENVH 525. Occupational Safety and Health Program Management. 3 Credits.

The establishment, implementation and maintenance of occupational safety and health programs. Paradigms of safety, techniques for safety training and creation of value for safety among business managers and employees are emphasized.

ENVH 526. Physical Hazards and Their Control. 3 Credits.

An in-depth examination of the varied types of physical hazards in the work environment and the methods of prevention, recognition and control.

ENVH 540. Principles of Ergonomics. 3 Credits.

An introduction to the terminology, concepts and applications of physiology, anthropometry, biomechanics and engineering to workplace and work methods design. Emphasis will be given to workplace design and work methods for job safety and health.

ENVH 541. Industrial Hygiene. 3 Credits.

An in-depth study of the chemical and physical agents responsible for occupational illness and the methods used for their measurement, evaluation and control.

ENVH 542. Sampling and Analysis Laboratory. 2 Credits.

Use and application of sampling and analytical equipment for measurement of chemical agents in the environment. Includes collecting media selection, sampling strategy, sample preparation and analysis. Prerequisites: ENVH 541 or permission of the instructor.

ENVH 545. Air Pollution and Its Control. 3 Credits.

The study of air pollution in relation to air quality criteria, pollutant production, atmospheric evolution, measurement and control techniques.

ENVH 546. Physical Hazards Laboratory. 2 Credits.

Use and application of sampling methods and equipment for measurement of physical hazards in the work environment. Includes aspects such as ergonomics, noise, vibration and radiation. Prerequisites: ENVH 541 or permission of the instructor.

ENVH 548. Epidemiology and Biostatistics. 1-3 Credits.

An introductory course in the principles and practices of epidemiology and the application of statistical and mathematical design and analysis of health research studies for the understanding and control of population health and disease with emphasis on environmental applications.

ENVH 561. Hazardous Waste Management. 3 Credits.

Description of the hazardous waste problem, the fundamentals of the chemistry involved with hazardous waste transport, methods of identification, assessment, control, and disposal of toxic and hazardous waste are discussed. In addition the relevant legal statutes, risk assessment emergency response and case studies are presented. Introduction to the toxicological effects of exposure to hazardous waste is discussed.

ENVH 565. Hazardous Materials Management. 3 Credits.

The management of hazardous materials includes a wide array of interlocking regulations addressing use, manufacturing, exposure, storage, shipping and disposal. A life cycle review of hazardous materials highlighting best practices and legislation is presented. Useful in preparation for CHMM examination.

ENVH 566. Environmental Risk Assessment and Decision Analysis. 3 Credits.

The principles of quantitative health risk assessment of toxicants are presented. Qualitative and quantitative skills necessary to evaluate the probability of injury, disease, or death in the general population from exposure to environmental contaminants are discussed. Hazardous identification, exposure assessment, dose-response evaluation and risk characterization are emphasized. Risk management group projects assessing some real environmental risks is an important segment of the class.

ENVH 570. Industrial Environmental Management. 3 Credits.

Course addresses day-to-day technical and management aspects of environmental compliance, as well as regulatory issues faced in industrial applications. Includes audits and inspections, air and water pollution and hazardous waste.

ENVH 595. Topics in Environmental Health. 1-3 Credits.

Advanced study of selected topics.

ENVH 598. Independent Study in Environmental Health. 1-3 Credits.

An opportunity is afforded students to undertake independent study under the direction of a faculty member. Prerequisites: permission of the Program Director.

ENVH 600. Principles of Environmental Health Science and Protection. 3 Credits.

An introduction to the chemical, physical and biological factors affecting human health and well being. The emphasis is on the application of controls to prevent disease and maximize environmental quality. (Cross-listed with CHP 602).

ENVH 602. Environmental Health Law and Policy. 3 Credits.

Prerequisites: MPH0 610 and MPH0 613. A review of the concepts and practice of administering environmental health control programs within agencies at the federal, state and local levels. The principles of administration and leadership of programs in the private sector are also discussed. The constitutional, statutory and administrative law bases for organizing and conducting such programs and developing environmental policy as well as the legal implications of enforcement will be addressed. A review of all major environmental statutes and their agencies that enforce them will be addressed.

ENVH 603. Environmental Epidemiology. 3 Credits.

Collection methods, analysis and interpretation of epidemiologic data with environmental and occupational disease emphasis.

ENVH 610. Food Microbiology. 4 Credits.

An in-depth examination of requirements for growth of food borne disease organisms. Includes hazard analysis and critical control point methodology.

ENVH 611. Water Pollution Control. 4 Credits.

A study of the chemical, physical and biological causes of surface and groundwater pollution. Emphasis is given to onsite wastewater systems and protection of groundwater supplies.

ENVH 621. Advanced Toxicology I. 4 Credits.

An in-depth study of the adverse interaction of environmental and occupational chemical agents with humans. Students critically review articles from the current toxicology literature with regard to scientific content, methods and conclusions. Each student presents at least two reviews during the semester. Prerequisites: ENVH 543.

ENVH 643. Principles of Toxicology. 3 Credits.

An introduction to the fundamentals of toxicology with emphasis on the interaction of environmental and industrial chemicals with humans are studied. Exposure, dose response, kinetics and distribution of toxicants, metabolism of toxic agents, factors that affect toxicity and introductory chemical carcinogenesis are discussed.

ENVH 695. Selected Topics in Environmental Health. 1-3 Credits.

The study of selected topics that may not offered regularly. Special topics will appear in the schedule of classes each semester.

ENVH 722. Control of Hazards in the Workplace. 3 Credits.

Advanced methods for evaluation and control of hazards in the workplace.

ENVH 795. Selected Topics in Environmental Health. 1-3 Credits.

The study of selected topics that may not be offered regularly. Special topics will appear in the schedule of classes each semester. Prerequisites: permission of the instructor.

ENVH 822. Control of Hazards in the Workplace. 3 Credits.

Advanced methods for evaluation and control of hazards in the workplace.

ENVH 895. Selected Topics in Environmental Health. 1-3 Credits.

The study of selected topics that may not be offered regularly. Special topics will appear in the schedule of classes each semester. Prerequisites: permission of the instructor.

ESPR - Exercise Science, Sport, PE, and Recreation

EXERCISE SCI, SPORT, PE, REC Courses

ESPR 609. Movement and Analysis of Dance and Rhythmic Activity. 3 Credits.

EXSC - Exercise Science

EXERCISE SCIENCE Courses

EXSC 508. Nutrition for Fitness and Sport. 3 Credits.

Emphasizes the role of nutrition as a means to enhance health and performance in sport. Topics covered include energy metabolism and nutrients, regulation of metabolism by vitamins and minerals, and weight control.

EXSC 515. Exercise Testing for Normal and Special Populations. 4 Credits.

The application of different methodologies in the measurement of physiologic responses to exercise. Emphasis is placed on understanding American College of Sports Medicine guidelines, appropriate experimental techniques, and equipment necessary to evaluate changes in body composition and various metabolic, cardiovascular, and respiratory adjustments during exercise.

EXSC 517. Biomechanics. 4 Credits.

Application of physical laws and mechanical principles to the human musculoskeletal system. Prerequisites: BIOL 250 and PHYS 111N.

EXSC 528. Exercise Prescription for Chronic Disease. 3 Credits.

A study of pathophysiology of common diseases with concentration in the design, implementation and administration of exercise prescription for a variety of chronic diseases.

EXSC 531. Wellness Programming and Administration. 3 Credits.

An introduction to the principles of administration and implementation of fitness and wellness programs to individuals, groups, centers and corporate settings.

EXSC 999. Exercise Science 999. 1 Credit.

A one-hour pass/fail registration required of all graduate students to maintain active status during the final semester prior to graduation. After successfully passing the candidacy examination, all doctoral students are required to be registered for at least one graduate credit each term until the degree is complete.

FIN - Finance

FINANCE Courses

FIN 605. Financial Management. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: ACCT 601 and BNAL 600. The course develops basic concepts of shareholders wealth maximization, net present value, security valuation, risk-return analysis, capital budgeting, cost of capital, capital structure, and dividend policy.

FIN 610. Principles of Risk and Insurance. 3 Credits.

Lecture and discussion 3 hours; 3 credits. Prerequisites: graduate standing and permission of the graduate program director. Risk theory as applied to the various fields of insurance, including life, health, property-liability and employee benefits.

FIN 613. Financial Management. 2 Credits.

To develop an integrated approach to the methodologies necessary for the understanding of modern corporate finance. Emphasis will be on integration of accounting and other internally generated information with external economic information within a framework for financial planning and valuation. Prerequisites: Admission to the MBA Program, ACCT 611, MBA 600, MBA 601, MBA 602, MBA 603, and MBA 604.

FIN 616. Investments and Portfolio Management. 2 Credits.

This course will provide students with an understanding of the theory and practice of investment decision making. Students will learn to analyze risk and return characteristics of individual securities and portfolios and develop valuation models of various financial instruments. Using insights from modern portfolio theory and equilibrium models of security prices, students will develop a framework for assessing the risk-return tradeoff. The topics covered and tools developed in the course will be applicable for personal investment as well. Prerequisites: Admission to the MBA Program, FIN 613, MBA 600, MBA 601, MBA 602, MBA 603, and MBA 604.

FIN 619. Business Law and Ethics. 2 Credits.

This course will introduce key principles of jurisprudence, dispute resolution, tort, constitutional, intellectual property and contract law. Students will learn to create the ability to recognize when a matter poses a legal issue in the ordinary course of business and identify alternative solutions that the law will support and consider the ethical/moral implications of business decisions that the law does not yet address. Prerequisites: Admission to the MBA Program, MBA 600, MBA 601, MBA 602, MBA 603, and MBA 604.

FIN 633. The Legal Environment of Business and the Age of Electronic Commerce. 3 Credits.

Prerequisite: graduate standing. An understanding of the traditional legal environment of business issues is essential for management to successfully utilize e-commerce and respond to legal problems that it will present. The course therefore examines dispute resolution, constitutional, tort, criminal, contract and property law, both in the context of traditional business practice and as applied to e-commerce.

FIN 668. Finance Internship. 1-3 Credits.

1-3 credits. Prerequisites: FIN 605, graduate standing, and permission of the department chair. The course is a practicum in the field of finance, applying theories, concepts, and financial management tools in a business environment.

FIN 697. Selected Topics in Finance. 1-3 Credits.

1-3 hours; 1-3 credits. Prerequisites: permission from the department chair and the graduate program director. Study designed for students who have had one or more of the required courses waived, or for students desiring additional work in a finance area of particular interest.

FIN 698. Selected Topics in Real Estate. 3 Credits.

3 hours; 3 credits. Prerequisites: permission from the department chair and the graduate program director. Study designed for students who have had one or more of the required courses waived, or for students desiring additional work in a finance area of particular interest.

FIN 699. Selected Topics in Insurance. 3 Credits.

3 hours; 3 credits. Prerequisites: permission from the department chair and the graduate program director. Study designed for students who have had one or more of the required courses waived, or for students desiring additional work in an insurance area of particular interest.

FIN 735. Portfolio Analysis. 3 Credits.

Lecture and discussion 3 hours; 3 credits. Prerequisite: FIN 605. A mathematical analysis of modern investment theory. Analyzes return and risk characteristics of individual securities and portfolios and develops valuation models of various financial instruments.

FIN 737. International Financial Management. 3 Credits.

Lecture and discussion 3 hours; 3 credits. Prerequisite: FIN 605. Examines such topics as the financial aspects of international business including financing and hedging activities of firms involved in international transfer of goods and services and decision making in connection with the asset management financing activities of multinational corporations.

FIN 740. Futures and Options. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: FIN 605. In no area of finance is the interface between academic theory and real-world practice as close as in the case of futures and options. We have now reached a stage where it is essential that all finance professionals understand how these markets work, how they can be used, and what determines prices in them. This course addresses all these issues.

FIN 741. Corporate Financial Policy and Control. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: FIN 605. The course will comprise mainly cases but there will be some lecturing particularly on material not covered in FIN 605.

FIN 795. Selected Topics in Finance. 3 Credits.

3 hours; 3 credits. Prerequisites: Ph.D. standing and permission of the chair and coordinator. Designed to provide the advanced student with an opportunity to study independently or in small groups and investigate specific topics of current interest in the field of finance.

FIN 835. Portfolio Analysis. 3 Credits.

Lecture and discussion 3 hours; 3 credits. Prerequisite: FIN 605. A mathematical analysis of modern investment theory. Analyzes return and risk characteristics of individual securities and portfolios and develops valuation models of various financial instruments.

FIN 837. International Financial Management. 3 Credits.

Lecture and discussion 3 hours; 3 credits. Prerequisite: FIN 605. Examines such topics as the financial aspects of international business including financing and hedging activities of firms involved in international transfer of goods and services and decision making in connection with the asset management financing activities of multinational corporations.

FIN 860. Advanced Financial Theory. 3 Credits.

Seminar 3 hours; 3 credits. Prerequisite: FIN 738/838. This course discusses the building blocks which much of financial theory is based on. In addition, a number of current topics in the literature are analyzed. Students are expected to read many of the original journal articles.

FIN 861. Seminar in Investments. 3 Credits.

Seminar 3 hours; 3 credits. Prerequisites: FIN 737/837. The purpose of this course is to be acquainted with recent theoretical and empirical literature on investments, portfolio management and speculative instruments. Emphasis will be placed on the development of methodological approaches to the various research problems.

FIN 862. Seminar in International Finance. 3 Credits.

Seminar 3 hours; 3 credits. Prerequisites: FIN 737/837. This course is designed to provide an in-depth understanding of the key issues of international financial management. Topics covered include balance of payments, interest rates, international capital flows/markets and asset pricing, foreign exchange risk management, and international capital budgeting.

FIN 863. Seminar in Current Financial Topics. 3 Credits.

Seminar 3 hours; 3 credits. Prerequisites: FIN 737/837, and 735/835. This course is structured to provide the student with research developments that lie on the frontier of corporate financial management. Topics covered include optimal investment and financing decisions, cost of capital, option pricing theory, equilibrium valuation models, efficient capital markets, capital structure, dividend policy, mergers and acquisitions and international financial management.

FIN 864. Directed Research Seminar. 3-6 Credits.

Lecture 3 hours; 3 credits. Corequisite: FIN 860. Prerequisite: FIN 861. This course represents an advanced study of empirical research methods in finance. It focuses on the empirical techniques used most often in the analysis of financial markets and how they are applied to actual market data. Topics includes: statistical properties of asset returns, nonlinear dynamics, and volatility modeling of financial assets.

FIN 895. Selected Topics in Finance. 3 Credits.

3 hours; 3 credits. Prerequisites: Ph.D. standing and permission of the chair and coordinator. Designed to provide the advanced student with an opportunity to study independently or in small groups and investigate specific topics of current interest in the field of finance.

FIN 899. Dissertation. 1-12 Credits.

1-12 credits. Prerequisite: FIN 863. An approved research project, written under the supervision of a faculty advisor, in which the student demonstrates the ability to conduct original research. The complete project must be approved by the dissertation committee.

FIN 998. FIN 998. 1 Credit.**FL - Foreign Languages****FOREIGN LANGUAGES Courses****FL 595. Topics in Foreign Languages. 1-3 Credits.**

1-3 credits each semester. Prerequisite: permission of the instructor or, in the case of 595, graduate standing. The advanced study of selected topics designed to permit small groups of qualified students to work on subjects of mutual interest which, due to their specialized nature, may not be offered regularly. These courses will appear in the schedule and will be more fully described by academic advisors.

FLET - Foreign Literature in English Translation**FOREIGN LITERATURE IN ENGLISH TRANSLATION Courses****FLET 510. Berlin-Paris: Crucibles of European Ideas. 3 Credits.**

Lecture 3 hours; 3 credits. This course explores the cultural movements that have characterized the German-French commonalities and differences from the early 1900s through the 1990s in cross-disciplinary discourses such as film, literature, art, politics, and economics.

FLET 545. German Cinema. 3 Credits.

Lecture 2 hours; laboratory 2 hours; 3 credits. This course will focus on the German cinema from perspectives such as fascism and its legacy, film as historical critique, or Weimar cinema.

FLET 571. Hispanic Women Authors. 3 Credits.

Lecture 3 hours; 3 credits. A study of fictional and non-fictional works by Spanish, Spanish-American, and U.S. Latina writers from the 16th to the 20th century. The course analyzes gender identity and roles and the interaction of gender, race, and class in literary representations of courtship and marriage, spirituality, nationalism, colonialism, and multiculturalism.

FLET 576. German-Jewish Literature and Culture. 3 Credits.

Lecture 3 hours; 3 credits. A survey of seminal texts by German-Jewish authors from the Enlightenment to the present day, including figures such as Marx, Kafka, Freud, Schnitzler and Arendt. Taught in English.

FLET 595. Topics in Foreign Literature in English Translation. 1-3 Credits.

1-3 credits each semester. The advanced study of selected topics designed to permit small groups of qualified students to work on subjects of mutual interest which, due to their specialized nature, may not be offered regularly. These courses will appear in the course schedule and will be more fully described by academic advisors.

FLET 596. Topics in Foreign Literature in English Translation. 1-3 Credits.

1-3 credits each semester. The advanced study of selected topics designed to permit small groups of qualified students to work on subjects of mutual interest which, due to their specialized nature, may not be offered regularly. These courses will appear in the course schedule and will be more fully described by academic advisors.

FOUN - Foundations of Education**FOUNDATIONS OF EDUCATION Courses****FOUN 611. Introduction to Research Methods in Education. 3 Credits.**

The primary goal of the course is to provide students with the knowledge and skills to access, evaluate, and synthesize empirical research. The course examines types of educational research and criteria for evaluating empirical studies. It introduces various types of research questions and associated research designs, components of research reports, sampling, validity of measures, threats to internal and external validity, and simple statistics.

FOUN 612. Applied Research Methods in Education. 3 Credits.

Lecture 3 hours, 3 credits. The primary goal of this course is to provide students with the knowledge and skills to write a research proposal and conduct research. It is intended for those students who are completing a thesis to meet their program requirements, those planning on pursuing a doctoral degree, or those who anticipate conducting research for any other reasons. The course examines types of educational research and criteria for selection of topics for research projects; describes criteria for effective collection and organization of data; review of literature, analysis of data and proposal writing.

FOUN 615. Research and Application of the Evolution of Education: History, Issues, Technology and Assessment. 3 Credits.

Lecture 3 hours, 3 credits. Course focuses on foundations of U.S. education system; legal aspects for educational delivery in the U.S. and Virginia; use and contributions of technology integration to learning outcomes; formative and summative assessment for improving learning outcomes of urban children and youth.

FOUN 640. Fundamentals of Measurement and Assessment. 3 Credits.

Lecture 3 hours, 3 credits. This course stresses the use of measurement and assessment for evaluation and decision making focusing on basic concepts applicable to all types of assessment: statistical concepts, reliability, validity, and interpretive frameworks for cognitive and non-cognitive measures.

FOUN 641. Assessment and Evaluation of Student Learning. 3 Credits.

Lecture 3 hours, 3 credits. The valid use of formative and summative assessment and evaluation principles for monitoring and promoting students' learning and development will be addressed. Students will learn how to construct and use a variety of formal and informal teacher assessment procedures.

FOUN 650. Human Development and Student Learning. 3 Credits.

Lecture, 3 hours; 3 credits. Corequisite: Student must be a participant in the Teacher Residency Grant. This course will focus on understanding children's and adolescents' physical, social, emotional, intellectual, and speech/language development; integrating and incorporating children and adolescent differences (economic, social, racial, ethnic, religious, physical, and mental) into understanding developmental issues as they relate to instruction, including the identification and instruction of students with exceptionalities as well as special needs. Research related to the classroom application of these theories is examined and evaluated based on principles of research design and interpretation.

FOUN 662. Assessment and Evaluation for Schools Serving Military Connected Children and Families. 4 Credits.

Lecture, 3 hours; Service learning, 1 hour. 4 credits. Prerequisite: COUN 605 and acceptance into the Military Child and Family Education Certificate Program. This course is designed to create educators and educational support service providers capable of assessing the needs of military children and able to self-assess their schools in terms of the comprehensive elements of a military conscious and supportive school. Students will become familiar with the Military Consciousness Assessment Toolkit (Mil-CAT), a comprehensive and dynamic self-assessment tool developed at ODU that provides a process and system for analyzing and prioritizing support structures and needs of military students across the school. Students will also apply basic constructs of assessment in order to develop skills for determining the individual academic, social, and emotional needs of military students and their families, as well as to design ways to assess classroom and school-wide interventions. Use of assessments of individual, group, and school-wide needs to design, implement, and evaluate contextually tailored interventions that support military connected students will be modeled and practices. This course is required for completion of the Military Child and Family Education graduate certificate. Students must be accepted to the certificate program or receive approval from the certificate program director in order to enroll.

FOUN 722. Introduction to Applied Statistics and Data Analysis. 3 Credits.

Lecture 3 hours, 3 credits. Introduction to basic topics in statistical analysis, including descriptive statistics and simple inferential statistics such as correlation, regression, t-tests, one-way analysis of variance, and chi-square.

FOUN 812. Research Design and Analysis. 3 Credits.

This course focuses on the application of advanced research design as it is applied in various educational disciplines. It provides an in-depth examination of quantitative research approaches, sampling techniques, threats to validity, ethical considerations and reviewing, writing quantitative methodology descriptions for research proposals and reports.

FOUN 813. Program Evaluation in Education. 3 Credits.

Examines procedures and problems in the design and utilization of program evaluation in education. Identifies evaluation purposes and the methods of evaluation especially as affected by organizational behavior, ethical considerations, and political influences. Evaluation methodology includes, but is not limited to, design considerations, data utilization, and teacher evaluation. Both quantitative and qualitative strategies will be covered.

FOUN 814. Qualitative Research Design in Education. 3 Credits.

This course concentrates on the theoretical underpinnings of qualitative research; methodology and methods including identification of ways to collect and analyze qualitative data; examination of ethical issues; development of proposals; and writing up studies.

FOUN 815. Advanced Qualitative Research. 3 Credits.

This advanced qualitative course is an introduction to emerging research approaches and alternative data collection methods and analyses in education, counseling and other related disciplines. Content addressed includes visual and audio research, historical movements in qualitative research, critical theory, feminism, queer theory, ethnomethodology, autoethnography, content analysis, and mixed methods research. Prerequisites: Instructor approval required.

FOUN 816. Single Subject Research Designs. 3 Credits.

Lecture 3 hours, 3 credits. This course is designed to provide the student knowledge and skills that relate to single subject methodology. It includes an overview of historical and philosophical foundations, basic issues in behavioral assessment, and single subject research and design methodology, including trend and statistical analysis in single subject research. Students will analyze critically empirical research and be able to plan, implement, and evaluate original research.

FOUN 818. Analysis with Large Datasets. 3 Credits.

This course concentrates on sample designs, design-based estimation/inference, data preparation, and analysis of complex survey data in education. Prerequisites: FOUN 822.

FOUN 822. Applied Linear Models in Educational Research. 3 Credits.

Introduction to the general linear model with emphasis on concepts and applications of multiple linear regression (MLR) to problems in educational research. Topics include estimation and interpretation of MLR models, relationships between MLR and analysis of variance (ANOVA), logistic regression analysis, and trend analysis. Prerequisite: FOUN 722.

FOUN 823. Analysis of Variance Applied to Educational Research. 3 Credits.

Lecture 3 hours, 3 credits. Prerequisite: FOUN 722. Introduction of analysis of variance models as applied in education and human services, including two-way and three-way factorial designs, analysis of covariance, repeated-measures, and mixed-model analysis.

FOUN 824. Design and Analysis for Causal Inference in Educational Contexts. 3 Credits.

Lecture 3 hours, 3 credits. Prerequisites: FOUN 822 and 823 or permission of instructor. Introduction to research design and statistical analysis for studies intended to support causal inferences. Topics include experimental, quasi-experimental, and ex post facto design and appropriate models for data analysis.

FOUN 825. Applied Multilevel Modeling in Educational Research. 3 Credits.

This course focuses on advanced applications of statistics that are used in educational research in various educational disciplines. Specifically, the course will offer an introduction to hierarchical linear modeling (HLM) of nested data as applied to education. Topics include conceptual and statistical background of two- and three-level designs, cross-level interaction effects, and application of multilevel models for repeated measures designs. Emphasis is on estimation, interpretation, and diagnostics for multilevel models of continuous outcomes. Prerequisites: FOUN 822 and FOUN 823 or instructor permission.

FOUN 826. Applied Structural Equation Modeling in Educational Research. 3 Credits.

Introduction to structural equation modeling and related multivariate procedures applied to research problems in education. Topics include a brief review of exploratory factor analysis, confirmatory (structural) factor analysis, path analysis, and structural equation modeling with observed and latent variables. Prerequisite: FOUN 822 and FOUN 823 or permission of instructor.

FOUN 827. Applied Logistic Regression. 3 Credits.

A practical and conceptual introduction to applying logistic and probit regression models to typical questions in the social sciences. Will utilize SPSS for practical applications covering simple and multiple regression models, interactions and curvilinear effects, multinomial models, testing of assumptions, and select advanced applications such as propensity score matching and missing data analysis. Prerequisites: FOUN 822 and FOUN 823 or permission of instructor.

FOUN 830. Theories of Learning and Instruction. 3 Credits.

Lecture 3 hours, 3 credits. The course consists of critical discussion and analysis of major learning theories that have influenced learning and instruction in today's schools. Applications of current research to instructional design will be emphasized.

FOUN 840. Educational Measurement and Assessment. 3 Credits.

Overview of advanced educational measurement and assessment ideologies as well as methods. Students will identify, critique, construct and administer educational measures. Psychometric topics such as reliability and validity will be explored as well as advanced assessment issues such as scale construction and item response theory.

FOUN 848. Assessment and Evaluation in Content Areas. 3 Credits.

Lecture 3 hours, 3 credits.

FOUN 850. Sociological and Philosophical Foundations of Education. 3 Credits.

Students examine the relationship between education and society by reviewing a variety of theoretical perspectives and empirical studies. Topics include: social mobility and stratification; social reproduction; the dynamics of race, class, and gender in education; social capital; the student-teacher relationship; teaching as a profession; and higher education.

FOUN 861. Ethnographic Research and Narrative & Historical Research Methods and Design. 3 Credits.

In this advanced qualitative research course, we invite students to focus on ethnographic methods such as ethnography, ethnomethodology, and autoethnomethodology. Students will also learn about participatory research methods. The course will examine narrative and historical research approaches including biography and autobiography. Prerequisites: FOUN 815.

FOUN 862. Critical and Indigenous Research Methods and Design. 3 Credits.

In this advanced qualitative methods course, we invite students to explore readings related to critical and indigenous research, methodologies and paradigms as well as engage in activities to decolonize traditional research approaches with specific groups. In this course we refer to Indigenous peoples as individuals and groups belonging to developing or underdeveloped regions nationally or internationally. Prerequisites: FOUN 815.

FOUN 863. Emerging Qualitative Research Methods. 3 Credits.

This advanced qualitative research course examines emerging and lesser known qualitative research methods such as self-study, portraiture, arts-based research, photovoice, rhizomatic analysis and critical policy analysis. Prerequisites: FOUN 815.

FOUN 864. Case Study, Grounded Theory & Phenomenological Research Methods & Design. 3 Credits.

This advanced qualitative research course examines the intricacies of case study methods. It also delves into the various qualitative research methods surrounding experience and theory formation such as Grounded Theory, Phenomenology, Heuristic Inquiry and Consensual Qualitative Research. Prerequisites: FOUN 815.

FOUN 865. Independent Qualitative Research. 3 Credits.

This capstone course involves the student developing and completing an original qualitative research project independent from the dissertation. Prerequisites: FOUN 815.

FOUN 869. Teaching Statistics Practicum. 3 Credits.

Advanced graduate students in the Ph.D. Educational Research, Evaluation and Educational Psychology concentration or other Ph.D. concentrations will have the opportunity to participate in research, consulting, internship, or assisting in teaching research methods and statistics courses. Prerequisites: FOUN 822 and FOUN 823.

FOUN 870. Formative Assessment of Student Learning for School Leaders and Curriculum Specialist. 3 Credits.

Lecture 3 hours, 3 credits. Overview of advanced educational measurement and assessment ideologies as well as methods. Students will identify, critique, construct and administer educational measures. Psychometric topics such as reliability and validity will be explored as well as advanced assessment issues such as scale construction and item response theory.

FOUN 881. Dissertation Seminar. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: FOUN 812, 814 and FOUN 822 or 823. Instructor approval required. The primary goal of the course is to develop a dissertation proposal. It is intended for doctoral students who have completed all other coursework. The course covers literature reviews, proposal writing, and obtaining approval from Human Subjects committees. Outlets for disseminating the research findings will be explored.

FOUN 897. Special Topics in Educational Foundations. 3 Credits.

Three hours; 3 credits. Special Topics in Educational Foundations will be used for independent studies with Foundations faculty members.

FOUN 899. Dissertation. 1-12 Credits.

Dissertation credit.

FOUN 999. Foundations of Education 999. 1 Credit.

1 credit. A one-hour pass/fail registration required of all graduate students to maintain active status during the final semester prior to graduation. After passing the candidacy examination, all doctoral students are required to be registered for at least one graduate credit each term until the degree is complete.

FR - French

FRENCH Courses

FR 507. Advanced Grammar and Syntax. 3 Credits.

Lecture 3 hours; 3 credits. An intensive study of French grammar and development of style through activities, including theme, version, composition, and dictation.

FR 510. Berlin and Paris: Crucibles of European Ideas. 3 Credits.

This course explores the cultural movements that have characterized the German-French commonalities and differences from the early 1900s through the 1990s in cross-disciplinary discourses such as film, literature, art, politics, and economics. Prerequisites: German and French students must read and write in the target language.

FR 515. Applied Phonetics. 3 Credits.

Lecture 3 hours; 3 credits. Designed to develop the mastery of spoken French. Intensive study of French phonetics with exercises in pronunciation and its application to media comprehension.

FR 520. Francophone Civilization. 3 Credits.

Lecture 3 hours; 3 credits. A study of the culture and civilization of selected Francophone countries: the Magreb, West Africa, La Republique Malgache, the Caribbean Islands, Canada, Belgium, and Switzerland, through cultural readings, art, music and literature.

FR 527. Studies in Seventeenth-Century French Literature. 3 Credits.

Following a preparatory period, the political stability of the French monarchy ushers in the golden age of classicism. Representative works from comic and dramatic theater, philosophy, poetry and the evolving novel.

FR 528. Studies in Eighteenth-Century French Literature. 3 Credits.

A study of the two main currents of ideas of the Age of Reason or Enlightenment; the rationalistic drive to question established authority, exemplified by the "Encyclopedie" and leading to the Revolution of 1789; and the Rousseauistic return to nature and emotivity. Representative readings.

FR 531. HISTORY OF FRENCH LANGUAGE. 3 Credits.**FR 537. Studies in Nineteenth-Century French Literature. 3 Credits.**

A study of the post-Revolutionary (1789) literary movements: Romanticism, Realism, Naturalism, Symbolism, which opened new horizons of modern science and culture in France. Representative works.

FR 538. Studies in Twentieth-Century French Literature. 3 Credits.

A study of the greatness and decadence of modern man trapped in the wild "belle epoque," then in two savage World Wars, and finally in the inhuman Nuclear Age. Reflecting great scientific advances, the vast new horizons to be discovered are mainly inward: Dadaism, Surrealism, Existentialism, Literature of the Absurd, Structuralism focus on the anguish, absurdity, and madness of modern life.

FR 569. A History of French Cinema. 3 Credits.

Lecture 3 hours; 3 credits. This course will function as a survey of French film classics from the birth of cinema through contemporary times, and also shed light on various French cultural and literary movements as they are represented in film (Surrealism, WWII, Nouvelle Vague, decolonization).

FR 595. Topics in French. 1-3 Credits.

The advanced study of the selected topics designed to permit small groups of qualified students to work on subjects of mutual interest which, due to their specialized nature, may not be offered regularly. These courses will appear in the course schedule and will be more fully described by academic advisors.

FR 596. Topics in French. 1-3 Credits.

The advanced study of the selected topics designed to permit small groups of qualified students to work on subjects of mutual interest which, due to their specialized nature, may not be offered regularly. These courses will appear in the course schedule and will be more fully described by academic advisors.

FR 695. Topics in French. 1-9 Credits.

Lecture 1-9 hours; 1-9 credits. Advanced study of selected topics which may not be offered regularly. These courses appear in the course schedule booklet and are more fully described in a supplement distributed to graduate program directors.

FR 696. Topics in French. 1-9 Credits.

Lecture 1-9 hours; 1-9 credits. Advanced study of selected topics which may not be offered regularly. These courses appear in the course schedule booklet and are more fully described in a supplement distributed to graduate program directors.

FR 697. Tutorial Work Topics in French. 1-3 Credits.

1-3 credits. Prerequisites: Approval of project. This course will allow an individual student to pursue a special topic or project under the guidance of a professor.

FR 698. Tutorial Work Topics in French. 1-3 Credits.

1-3 credits. Prerequisites: Approval of project. This course will allow an individual student to pursue a special topic or project under the guidance of a professor.

GEOG - Geography

GEOGRAPHY Courses

GEOG 500. Seminar in Geography. 3 Credits.

Advanced study of a specialized topic in geography. The choice of the topic may vary according to the availability of faculty expertise and student interest.

GEOG 502. Geographic Information Systems. 3 Credits.

A study of the conceptual basis of GIS as a tool for manipulating spatial information. The course focuses on how geographic information can be input and organized within the framework of a GIS. Students will work on a computer-based GIS to gain a greater understanding of spatial database structures and analytical operations.

GEOG 504. Digital Techniques for Remote Sensing. 3 Credits.

Study of the theory and application of remote sensing, emphasizing environmental applications and aerial and satellite imagery. Covers the fundamentals of multispectral digital image processing, including sensors pre-processing, enhancement, classification, accuracy assessment, and GIS data integration.

GEOG 505. Seminar in International Resource Management. 3 Credits.

Discussion of the ecological and management principles underlying international resource management and the goal of attaining a sustainable, ecologically balanced world.

GEOG 508. Cartography. 3 Credits.

Computer-assisted methods and techniques employed in the design, construction, and use of maps and other graphics as tools for data analysis and communication.

GEOG 510. Seminar in Urban Geography. 3 Credits.

Discussion of specific urban and metropolitan problems based on outside readings and individually selected research topics.

GEOG 511. Urban and Regional Planning. 3 Credits.

A study of planning concepts and powers used to guide contemporary metropolitan growth and development. Emphasis is on the application of social science principles and methods to the planning process.

GEOG 512. Cities of the World. 3 Credits.

An examination of cities of the world's major cultural realms with an emphasis on the urban landscape as it varies between developed and developing countries.

GEOG 519. Spatial Analysis of Coastal Environments. 3 Credits.

The course integrates remotely sensed and field techniques for scientific investigation and practical management of coastal environmental systems. Spatial modeling of coastal processes and management tools using Geographic Information System (GIS). Prerequisites: GEOG 504.

GEOG 520. Marine Geography. 3 Credits.

An analysis of human-sea relationships with particular emphasis on resource management and political organization from global, regional, and national perspectives.

GEOG 522. Coastal Geography. 3 Credits.

An examination of the physical and human geography of the coastal zone. Considers problems of managing coastal resources with an emphasis on North America. Lectures focus on coastal patterns, processes, and problems at the global, national, and local scales. Students investigate a section of the local coastline and write a report on the physical and human geography on the basis of field study, library, and internet research.

GEOG 525. Internet Geographic Information Systems. 3 Credits.

Theoretical and practical exploration of methods, standards, and policies related to the development and utilization of geographic information systems on the Internet. Students will create and utilize distributed geospatial data and analytical systems using the WWW and the Internet to address geographical problems. Prerequisites: GEOG 502.

GEOG 532. Advanced GIS. 3 Credits.

The study of a series of advanced topics in the field of geographic information systems/science. Focus is placed on the development of projects/models and a survey of several advanced techniques. Students will work on a computer based GIS to implement topics from lectures. Prerequisites: GEOG 502.

GEOG 551. Europe. 3 Credits.

A geographical analysis of the interrelationships among physical, cultural, economic, and political factors in Europe.

GEOG 552. Africa. 3 Credits.

A geographical analysis of the interrelationships among physical, cultural, economic, and political factors in Africa.

GEOG 553. Asia. 3 Credits.

A geographical analysis of the interrelationships among physical, cultural, economic, and political factors in Asia excluding the Middle East and the former USSR.

GEOG 554. Latin America. 3 Credits.

A geographical analysis of the interrelationships among physical, cultural, economic, and political factors in Latin America.

GEOG 555. The Middle East. 3 Credits.

A geographical analysis of the interrelationships among physical, cultural, economic, and political factors in the Middle East.

GEOG 556. Geography of Southeast Asia. 3 Credits.

Analysis of the physical, historical, cultural, economic, environmental, and political patterns and problems of Southeast Asia. The focus is on the diversity of the region and on the nature and impact of development.

GEOG 558. Geography of Virginia. 3 Credits.

An analysis of Virginia's population, resources, and regional landscapes as they have been influenced by physical, cultural, historical, and economic factors.

GEOG 590. Applied Cartography/GIS. 1-3 Credits.

Practical experience in applying the principles of cartography and geographical information systems to the design and construction of maps and other graphics.

GEOG 595. Topics in Geography. 1-4 Credits.

The advanced study of selected topics which, due to their specialized nature, may not be offered regularly. These courses will appear in the course schedule, and will be more fully described in information distributed to academic advisors.

GEOG 596. Topics in Geography. 1-4 Credits.

The advanced study of selected topics which, due to their specialized nature, may not be offered regularly. These courses will appear in the course schedule, and will be more fully described in information distributed to academic advisors.

GEOG 597. Independent Research in Geography. 1-3 Credits.

Independent reading and study on a topic to be selected under the direction of the instructor. Conferences and papers as appropriate.

GEOG 598. Tutorial Work in Geography. 1-3 Credits.

Independent research under the supervision of a faculty member.

GEOG 620. Seminar in Political Geography. 3 Credits.

A study of the interrelationships of political and geographic phenomena, and theories of geopolitics; examines in a seminar format the political geography both of specific topics such as the national integration of states, refugees and resources, and of particular regions of the world.

GEOG 625. Ethno-Regionalism. 3 Credits.

An examination of the geopolitics of world ethnic minorities with special reference to selected "trouble spots" on the world political map.

GEOG 650. Seminar in Regional Geography. 1-3 Credits.

Advanced seminar on a particular country or world region.

GEOG 668. Internship. 1-6 Credits.

Individualized practical experience.

GEOG 695. Selected Topics in Geography. 1-3 Credits.

Advanced study of selected topics designed to permit small groups of qualified students to work on subjects of mutual interest.

GEOG 696. Selected Topics in Geography. 1-3 Credits.

Advanced study of selected topics designed to permit small groups of qualified students to work on subjects of mutual interest.

GEOG 697. Independent Research in Geography. 1-3 Credits.

Independent research in geography under the supervision of a faculty member.

GER - German

GERMAN Courses

GER 507. Advanced Grammar and Syntax. 3 Credits.

Lecture 3 hours; 3 credits. This course deals with idioms and the fine points of grammar with the aim of helping students to develop a good style in written German. Special problems of non-native speakers are analyzed and treated individually.

GER 508. Conversation and Composition. 3 Credits.

Lecture 3 hours; 3 credits. Designed to develop the mastery of spoken and written German. Recommended for prospective teachers.

GER 510. Berlin and Paris: Crucibles of European Ideas. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: German and French students must read and write in the target language. This course explores the cultural movements that have characterized the German-French commonalities and differences from the early 1900s through the 1990s in cross-disciplinary discourses such as film, literature, art, politics, and economics. Cross-listed with FLET 510.

GER 520. Masterpieces of German Poetry. 3 Credits.

Lecture 3 hours; 3 credits. The course will focus on exemplary poems of distinct cultural periods, ranging from the courtly love tradition of the Middle Ages to the political poetry surrounding the fall of the Berlin Wall.

GER 545. German Cinema. 3 Credits.

Lecture 2 hours; laboratory 2 hours; 3 credits. This course will focus on the German cinema from perspectives such as fascism and its legacy, film as historical critique, or Weimar cinema. (Cross-listed with FLET 545 and COMM 544).

GER 550. German Satires and Parodies. 3 Credits.

Lecture 3 hours; 3 credits. The course will analyze satirical features and parodic strategies in exemplary literature and visual texts from late medieval carnival plays to contemporary cabaret. Texts include excerpts from Brant's Ship of Fools, examples of romantic irony in Bonaventura and Heine, the graphic art of caricature from Reformation broad sheets to today's political cartoons, as well as literary parodies from Wagnerian opera to Viennese chanson.

GER 555. Germany 1900-1945: From High Culture to Holocaust. 3 Credits.

Lecture 3 hours; 3 credits. A study of representative works from the last years of the Austro-Hungarian Empire, the Wilhelmine Empire and the Weimar Republic, including Freud, Hofmannsthal, Kafka, Brecht, Hesse, Thomas Mann et al. The course will also discuss literature illustrating the genesis and ideology of the Third Reich.

GER 570. Post World War II Germany. 3 Credits.

Lecture 3 hours; 3 credits. The course will cover representative literary texts and cultural events of divided and united Germany, including Heinrich Böll, Günter Grass, Max Frisch, Christa Wolf, Doris Dörrie et al, as well as film, painting, popular music, the culture of memory and German Jewish relations after the Shoah.

GER 573. The Enlightenment and Its Critics. 3 Credits.

Lecture 3 hours; 3 credits. This course focuses on German intellectual history as represented by thinkers such as Lessing, Kant, Hegel, Marx, Nietzsche, and Freud. More recent works by Frankfurt School writers Adorno and Horkheimer represent critical engagements with the tenets of the European Enlightenment.

GER 576. German-Jewish Literature and Culture. 3 Credits.

Lecture 3 hours; 3 credits. A survey of seminal texts by German-Jewish authors from the Enlightenment to the present day, including figures such as Marx, Kafka, Freud, Schnitzler and Arendt. (cross-listed with FLET 576).

GER 578. German Drama. 3 Credits.

Lecture 3 hours; 3 credits. An exploration of German dramatic works ranging from the Enlightenment period to contemporary drama. Students will read individual works by authors such as Lessing, Goethe, Schiller, Hebbel, Brecht, or Jelinek as well as texts concerned with the function of drama in German culture by these and other authors.

GER 595. Topics in German. 1-3 Credits.

1-3 credits each semester. Prerequisite: appropriate survey course or permission of the instructor. The advanced study of selected topics designed to permit small groups of qualified students to work on subjects of mutual interest which, due to their specialized nature, may not be offered regularly. These courses will appear in the course schedule and will be more fully described by academic advisors.

GER 596. Topics in German. 1-3 Credits.

1-3 credits each semester. Prerequisite: appropriate survey course or permission of the instructor. The advanced study of selected topics designed to permit small groups of qualified students to work on subjects of mutual interest which, due to their specialized nature, may not be offered regularly. These courses will appear in the course schedule and will be more fully described by academic advisors.

GER 695. Topics in German. 1-9 Credits.

Lecture 1-9 hours; 1-9 credits. Advanced study of selected topics which may not be offered regularly. These appear in the course schedule booklet and are more fully described in a supplement distributed to graduate program directors.

GER 696. Topics in German. 1-9 Credits.

Lecture 1-9 hours; 1-9 credits. Advanced study of selected topics which may not be offered regularly. These appear in the course schedule booklet and are more fully described in a supplement distributed to graduate program directors.

GER 697. Tutorial Work in German. 3 Credits.

3 credits. Prerequisites: approval of project. This course will allow an individual student to pursue a special topic or project under the guidance of a professor.

GER 698. Tutorial Work in German. 3 Credits.

3 credits. Prerequisites: approval of project. This course will allow an individual student to pursue a special topic or project under the guidance of a professor.

HE - Health Education

HEALTH EDUCATION Courses

HE 502. Methods and Materials in Health Education. 3 Credits.

Instruction in methods of teaching, organization of classes, evaluation of outcomes, and selection of content for health and safety education. Collection, evaluation, and application of health and safety education materials are emphasized. This course is to be completed prior to student teaching. Field experience is required.

HE 581. Teaching Sexuality Education in Schools. 3 Credits.

This course is concerned with suitable methods and materials for use in teaching sex education in the home, community, and school setting. A family living element is in the program. Prerequisites: PE 300 and junior standing.

HE 597. Topics in Health Education. 1-3 Credits.

This course provides an opportunity for in-depth study of selected topics in the variety of areas constituting health education.

HE 598. Topics in Health Education. 1-3 Credits.

This course provides an opportunity for in-depth study of selected topics in the variety of areas constituting health education.

HIED - Higher Education

HIGHER EDUCATION Courses

HIED 668. Internship in Higher Education Administration. 3-6 Credits.

Prerequisites: permission of instructor, COUN 633, 635, 707/807 and HIED 708/808 and 745/845. The university advisor and site supervisor will work with the student to develop and implement a set of objectives intended to familiarize the student with the operation of an administrative area within an institution of higher education, to assist the student to acquire practical skills in the operation of that office and to develop skills that are transferable to other administrative areas.

HIED 708. Contemporary Issues in Higher Education. 3 Credits.

Lecture and discussion 3 hours; 3 credits. This course is intended to present a broad exploration and generate greater understanding of contemporary issues influencing higher education that will involve discussion, written and oral reports and the integration of knowledge across the spectrum of issues relating to higher education.

HIED 710. Introduction to Student Affairs Administration. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: COUN 707. This course is intended to be an introduction to the practice of student affairs work in American Higher Education. It will introduce students to the theoretical foundations of student affairs. It will also provide students with a structural framework for student affairs organization, problems, issues and ideas.

HIED 712. Strategic Planning and Institutional Effectiveness. 3 Credits.

Lecture 3 hours; 3 credits. Strategic Planning and institutional effectiveness is becoming more and more important to institutions as funding sources change and students demand quality. This course will examine how these processes can be carried out on American campuses.

HIED 720. The Private College and University. 3 Credits.

Lecture 3 hours; 3 credits. The U.S. Higher Education system contains great diversity due to the inclusion of private institutions. This course will examine the structure and organization of Higher Education in the U.S. as well as differences and similarities between private and public institutions.

HIED 733. Professional Helping Skills in Higher Education. 3 Credits.

Lecture 3 hours; 3 credits. This course will focus on developing the knowledge, attitude and skills essential to working with individuals seeking assistance with problems that they face while in college. Listening and interviewing skills will be addressed.

HIED 743. Introduction to International Higher Education Administration. 3 Credits.

Lecture 3 hours; 3 credits. This course surveys key aspects of international higher education administration in an American university setting, including study abroad, recruitment and admission of international students, international student and scholar services, and English language preparation.

HIED 744. Comparative Higher Education Systems. 1,3 Credit.

Lecture 3 hours; 3 credits. This course presents the development of the three primary systems of higher education in the world today: the U.S., British and European (Confidential) systems. It will also, as appropriate, examine other systems of higher education from around the world.

HIED 745. Today's College Student and Diversity. 3 Credits.

Lecture and discussion 3 hours; 3 credits. This course is a sociological survey of theoretical and research literature describing college students from multiple views. These include demographic profiles; undergraduate student growth and development; cognitive and non-cognitive predictors of the impact of the collegiate experience; implications and outcomes of college attendance; and the specific characteristics of particular student populations.

HIED 752. The Law of Higher Education. 3 Credits.

Lecture and discussion 3 hours; 3 credits. Legal perspectives related to higher education will be discussed as a major part of the course. Among the topics to be discussed will be the bases from which higher education law comes, current (case, state and regulatory) law, as well as risk management and liability issues for higher education. The remainder of the course will focus upon the ethical issues that must be faced when shaping and implementing institutional policy, curriculum and procedures. Some emphasis will be placed on the areas in which legal and ethical issues come into conflict. This course should be taken near the end of the master's program.

HIED 756. Higher Education Finance. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisites: HIED 708 and 794. Higher Education Finance is an intensive course devoted to the examination of concepts and management practices in higher education finance. The course is intended to provide prospective college and university administrators with both a theoretical and working knowledge of techniques, issues, policy, and practices as they are related to management and administration of colleges and universities in the U.S.

HIED 757. The Multicultural University. 3 Credits.

Lecture 3 hours; 3 credits. Research, philosophical, and policy literature on multiculturalism in higher education administration and leadership is surveyed. Topics covered include demographics and multiculturalism, university mission, admission, program and student assessment and evaluation, benefits of multiculturalism, faculty roles and responsibilities, teaching and learning outcomes, recruiting and graduating multicultural students, inclusive curriculum design, and student services.

HIED 758. Higher Education Leadership. 3 Credits.

Lecture 3 hours; 3 credits. The course will provide students with the basic theory, knowledge and skills needed to be an effective leader within post-secondary educational institutions, with a primary focus on public, private and non-traditional four-year colleges and universities.

HIED 761. Higher Education Capstone. 3 Credits.

Lecture 3 hours; 3 credits. The course is a culminating experience for the master's degree intended to integrate and apply the knowledge gained in the degree programs to complex issues with policy and practice in higher education.

HIED 762. Development and Fund Raising. 3 Credits.

Lecture 3 hours; 3 credits. The major areas of institutional advancement and fund-raising form the fundamental outline for the course. Students will explore the professional literature and hear lectures from experts in the areas of: institutional marketing, event management, developing a campaign, use of the internet, donor identification and cultivation, planned giving, developing corporate partners, and foundation management.

HIED 763. Case Studies in Higher Education. 3 Credits.

Lecture 3 hours; 3 credits. This course consists of a thorough analysis and dissection of case studies which cover a broad range of higher education administrative areas. For each case, students will examine the facts, including relevant benchmark law; contemporary issues; historical perspective; political realities; institutional mission and culture; ethical considerations; leadership and management approaches; and an analysis of courses of action available to decision-makers.

HIED 764. College and the University Presidency. 3 Credits.

This course is designed to provide greater understanding of the leadership role of college and university presidents and the multiplex of issues associated with the office of the presidency at the various types of American institutions. The course will utilize case study analysis, guest presentation, and review of the literature. There will be rigorous discussion, readings, and analyses in a collegial and reciprocal learning environment.

HIED 765. Adult and Continuing Education. 3 Credits.

An advanced seminar emphasizing the historical, philosophical, and institutional analyses of the development and status of adult and continuing education within the higher education community.

HIED 766. The Modern Community College. 3 Credits.

Lecture 3 hours; 3 credits. This course is a study of the institutional characteristics of the community college, including a review of the history, purpose, students, faculty, administration and organization, finance, and social functions. Considerable attention will be given to current issues facing community colleges. This course is an elective within the master's program and a required course in the Ph.D. in Community College Leadership.

HIED 770. External and Internal Relations for Higher Education. 3 Credits.

Lecture, 3 hours. 3 credits. This course serves as an introduction for prospective and current administrators to the social and political context of the higher education environment and its various constituencies. It will teach them to recognize the impact of politics, socioeconomic situations, diversity, media, monetary issues, and equity issues on their leadership practices.

HIED 771. American Higher Education in a Global Context. 3 Credits.

This course is designed to broaden and deepen students' understanding of contemporary developments in global higher education and to develop analytic skills for understanding the global social, political, and economic processes shaping U.S. higher education in particular. Research and policy literature on current issues in global higher education is used to examine topics including cross-border higher education, student and scholar mobility patterns, the impact of emerging technologies, and transnational research and development partnerships.

HIED 793. The History of Higher Education in the United States. 3 Credits.

Lecture and discussion 3 hours; 3 credits. This course is designed to provide a broad overview of the historical development of higher education with a concentration on American higher education and its growth and development since the founding of Harvard in 1636. Because of its importance within the spectrum of higher education in the United States, some concentration will be spent upon the development of higher education in Virginia as well.

HIED 794. Organization and Administration of Higher Education in the United States. 3 Credits.

Lecture and discussion 3 hours; 3 credits. Through lectures, visiting presenters, student presentations of literature, and projects and readings, this course is designed to be an introduction/survey of administration, organization and governance of higher education institutions in the United States. In addition to introducing students to the issues, this experience is intended to help students understand the competencies and training necessary to undertake various operational roles in higher education.

HIED 795. Topics in Higher Education Administration. 1-6 Credits.

1-3 credits. Prerequisite: permission of the instructor.

HIED 808. Contemporary Issues in Higher Education. 3 Credits.

Lecture and discussion 3 hours; 3 credits. This course is intended to present a broad exploration and generate greater understanding of contemporary issues influencing higher education that will involve discussion, written and oral reports and the integration of knowledge across the spectrum of issues relating to higher education.

HIED 809. Proseminar in Higher Education. 3 Credits.

Designed as the first course for doctoral students in the Higher Education program, this course has two primary purposes: to provide information on the doctoral process in the Higher Education Program that will help doctoral students successfully navigate their programs and to help entering doctoral students enhance their abilities in the areas of critical reading, critical thinking and analysis, writing, and inquiry. The course will focus on approaches to scholarly writing in the field, strategies for inviting and providing peer review and feedback, and skills useful in analytical reading of scholarly work.

HIED 810. Introduction to Student Affairs Administration. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: COUN 807. This course is intended to be an introduction to the practice of student affairs work in American Higher Education. It will introduce students to the theoretical foundations of student affairs. It will also provide students with a structural framework for student affairs organization, problems, issues and ideas.

HIED 812. Strategic Planning and Institutional Effectiveness. 3 Credits.

Lecture 3 hours; 3 credits. Strategic Planning and institutional effectiveness is becoming more and more important to institutions as funding sources change and students demand quality. This course will examine how these processes can be carried out on American campuses.

HIED 820. The Private College and University. 3 Credits.

Lecture 3 hours; 3 credits. The U.S. Higher Education system contains great diversity due to the inclusion of private institutions. This course will examine the structure and organization of Higher Education in the U.S. as well as differences and similarities between private and public institutions.

HIED 825. Higher Education Policy. 3 Credits.

This course will help students develop an understanding of how the public policy process influences educational policy. It probes intensely into the context and role of policymaking by considering the interconnections between the historical development and social, political, and economic aspirations of government and their relationship to education. Students will consider why some problems are escalated to the public agenda, why some solutions are adopted and others rejected, and why some policies appear to succeed while others seem to fail. Students will analyze the role of the state in educational policy formation, adoption, and implementation by providing an overarching framework that examines the theoretical approaches to the policy process as it relates to government as a policy system.

HIED 833. Professional Helping Skills in Higher Education. 3 Credits.

Lecture 3 hours; 3 credits. This course will focus on developing the knowledge, attitude and skills essential to working with individuals seeking assistance with problems that they face while in college. Listening and interviewing skills will be addressed.

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Lecture 3 hours; 3 credits. This course surveys key aspects of international higher education administration in an American university setting, including study abroad, recruitment and admission of international students, international student and scholar services, and English language preparation.

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Lecture 3 hours; 3 credits. This course presents the development of the three primary systems of higher education in the world today: the U.S., British and European (Confidential) systems. It will also, as appropriate, examine other systems of higher education from around the world.

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HIED 857. The Multicultural University. 3 Credits.

Lecture 3 hours; 3 credits. Research, philosophical, and policy literature on multiculturalism in higher education administration and leadership is surveyed. Topics covered include demographics and multiculturalism, university mission, admission, program and student assessment and evaluation, benefits of multiculturalism, faculty roles and responsibilities, teaching and learning outcomes, recruiting and graduating multicultural students, inclusive curriculum design, and student services.

HIED 858. Higher Education Leadership. 3 Credits.

Lecture 3 hours; 3 credits. The course will provide students with the basic theory, knowledge and skills needed to be an effective leader within post-secondary educational institutions, with a primary focus on public, private and non-traditional four-year colleges and universities.

HIED 862. Development and Fund Raising. 3 Credits.

Lecture 3 hours; 3 credits. The major areas of institutional advancement and fund-raising form the fundamental outline for the course. Students will explore the professional literature and hear lectures from experts in the areas of: institutional marketing, event management, developing a campaign, use of the internet, donor identification and cultivation, planned giving, developing corporate partners, and foundation management.

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Lecture 3 hours; 3 credits. This course consists of a thorough analysis and dissection of case studies which cover a broad range of higher education administrative areas. For each case, students will examine the facts, including relevant benchmark law; contemporary issues; historical perspective; political realities; institutional mission and culture; ethical considerations; leadership and management approaches; and an analysis of courses of action available to decision-makers.

HIED 864. College and the University Presidency. 3 Credits.

This course is designed to provide greater understanding of the leadership role of college and university presidents and the multiplex of issues associated with the office of the presidency at the various types of American institutions. The course will utilize case study analysis, guest presentation, and review of the literature. There will be rigorous discussion, readings, and analyses in a collegial and reciprocal learning environment.

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An advanced seminar emphasizing the historical, philosophical, and institutional analyses of the development and status of adult and continuing education within the higher education community.

HIED 866. The Modern Community College. 3 Credits.

Lecture 3 hours; 3 credits. This course is a study of the institutional characteristics of the community college, including a review of the history, purpose, students, faculty, administration and organization, finance, and social functions. Considerable attention will be given to current issues facing community colleges. This course is an elective within the master's program and a required course in the Ph.D. in Community College Leadership.

HIED 868. Internship: Higher Education Administration. 3 Credits.

3 credits. This internship provides Education Specialist and doctoral students an opportunity to gain practicum experience in mid-level or senior administrative settings in higher education.

HIED 870. External and Internal Relations for Higher Education. 3 Credits.

Lecture, 3 hours. 3 credits. This course serves as an introduction for prospective and current administrators to the social and political context of the higher education environment and its various constituencies. It will teach them to recognize the impact of politics, socioeconomic situations, diversity, media, monetary issues, and equity issues on their leadership practices.

HIED 871. American Higher Education in a Global Context. 3 Credits.

This course is designed to broaden and deepen students' understanding of contemporary developments in global higher education and to develop analytic skills for understanding the global social, political, and economic processes shaping U.S. higher education in particular. Research and policy literature on current issues in global higher education is used to examine topics including cross-border higher education, student and scholar mobility patterns, the impact of emerging technologies, and transnational research and development partnerships.

HIED 893. The History of Higher Education in the United States. 3 Credits.

Lecture and discussion 3 hours; 3 credits. This course is designed to provide a broad overview of the historical development of higher education with a concentration on American higher education and its growth and development since the founding of Harvard in 1636. Because of its importance within the spectrum of higher education in the United States, some concentration will be spent upon the development of higher education in Virginia as well.

HIED 894. Organization and Administration of Higher Education in the United States. 3 Credits.

Lecture and discussion 3 hours; 3 credits. Through lectures, visiting presenters, student presentations of literature, and projects and readings, this course is designed to be an introduction/survey of administration, organization and governance of higher education institutions in the United States. In addition to introducing students to the issues, this experience is intended to help students understand the competencies and training necessary to undertake various operational roles in higher education.

HIED 895. Topics in Higher Education Administration. 1-6 Credits.
1-3 credits. Prerequisite: permission of the instructor.

HIED 899. Dissertation. 1-12 Credits.

1-12 credits. Prerequisite: permission of faculty advisor.

HIED 998. HIED 998. 1 Credit.

HIED 999. Higher Education 999. 1 Credit.

1 credit. A one-hour pass/fail registration required of all graduate students to maintain active status during the final semester prior to graduation. After successfully passing the candidacy examination, all doctoral students are required to be registered for at least one graduate credit each term until the degree is complete.

HIST - History

HISTORY Courses

HIST 508. War and American Society in the Twentieth Century. 3 Credits.

This course is an exploration of the content and meaning of wartime experiences within American society between 1898 and 1975. Emphasis is on comparing the levels of national, institutional and personal experiences of war as they affected people at home and in battle, and on considering the relationships between warring and social development at particular times.

HIST 509. History of US-Mexico Borderlands. 3 Credits.

The course examines the history of the region straddling the U.S.-Mexico Border from the Spanish Conquest to the present day, focusing on issues of immigration, economic and political integration and the complicated nature of state-building in a transnational environment.

HIST 520. Fascism in Europe. 3 Credits.

This course explores the genesis and development of fascism in Europe between World Wars I and II. Particular emphasis on Fascism in Italy and National Socialism in Germany. Appeal of fascist movements to populations across the socioeconomic spectrum, fluidities of ideology and practice, fascism's impact on political, economic, social, and cultural life in the interwar period are explored.

HIST 539. Politics and Society in East Asia Since 1945. 3 Credits.

This course explores the political and social developments in Japan, China, and Korea since the end of World War II.

HIST 555. African-American Historiography. 3 Credits.

This course is an examination of the ways historians have addressed specific issues in African-American history.

HIST 556. Research in Local History. 3 Credits.

The course explores the history of Hampton Roads through student use of research materials.

HIST 570. Democracy and Development in Modern Latin America. 3 Credits.

This course analyzes, from a historical perspective, two core problems in Latin America's modern (since c. 1880) history: political authoritarianism and economic underdevelopment. The temporal and spatial dimensions of change are highlighted in discussions of patron-client political systems, military autonomy and impunity, social movements and revolution, export-oriented economic growth, industrialization, and the roles of national, ethnic and gender identities.

HIST 575. History of Modern Africa. 3 Credits.

The course is designed to enrich students' understanding of the intersections of political, economic, social and cultural forces that shaped Africa in the last 150 years and continue to affect the lives of peoples throughout the continent. It will focus on a series of major historical transitions that have shaped the development of modern Africa, including the end of the Atlantic slave trade, European imperial conquest and colonial rule, African resistance to European rule, social and cultural transformations, the end of colonial rule and post-colonial challenges.

HIST 595. Topics in History. 1-3 Credits.

The course is an advanced study of selected topics designed for small groups of qualified students to work on subjects of mutual interest which may not be offered regularly. These courses appear in the course schedule, and will be more fully described in information distributed to academic advisors.

HIST 597. Tutorial Work in Special Topics in History. 3 Credits.

Independent reading and study on a topic to be selected under the direction of an instructor. Conferences and papers as appropriate.

HIST 598. Tutorial Work in Special Topics in History. 3 Credits.

Independent reading and study on a topic to be selected under the direction of an instructor. Conferences and papers as appropriate.

HIST 600. Historical Theory and Practice. 3 Credits.

Lecture 3 hours; 3 credits. Analysis of the development of historical theories, principles and methods and their application to historical research and writing. Required of all graduate students in history.

HIST 602. Studies in American Colonial and Revolutionary History. 3 Credits.

Seminar; 3 credits.

HIST 604. Studies in American History, 1787-1877. 3 Credits.

Seminar; 3 credits.

HIST 608. Studies in American History, 1933 to the Present. 3 Credits.

Seminar; 3 credits.

HIST 612. Studies in the History of the South. 3 Credits.

Seminar; 3 credits.

HIST 616. Studies in American Diplomatic History. 3 Credits.

Seminar; 3 credits.

HIST 618. Studies in American Social History. 3 Credits.

Seminar; 3 credits.

HIST 622. The Atlantic Slave Trade. 3 Credits.

Lecture 3 hours; 3 credits. The course will explore the trans-Atlantic slave trade from its beginnings in the 15th century to its suppression in the 19th century. It will examine the vast body of historical literature on Africa, the Atlantic slave trade and the New World. The course will provide students with a general orientation to the broad context of the Atlantic slave trade. Locating the trade in the context of the expansion of capitalist Europe, students will examine the economic and cultural forces, as well as personal experiences of slavery from Africa, across the Atlantic Ocean, to the Americas. The course will also look at how the trade transformed Africa and how Africa and Africans in turn transformed the Atlantic World.

HIST 625. Studies in African-American History. 3 Credits.

Seminar; 3 credits.

HIST 633. Studies in International History. 3 Credits.

Seminar; 3 credits.

HIST 634. Studies in the History of Military Affairs. 3 Credits.

Seminar; 3 credits.

HIST 637. Studies in War and the Humanities. 3 Credits.

Lecture 3 hours; 3 credits. The impact of war on society, literature and the arts.

HIST 640. Studies in East Asian History. 3 Credits.

Seminar; 3 credits.

HIST 645. Studies in Latin American History. 3 Credits.

Seminar; 3 credits.

HIST 646. Studies in Russian History. 3 Credits.

Lecture 3 hours; 3 credits. Research in Soviet archives in the past decade has enriched and enlarged the study of Stalin's era (1924-1953). This reading seminar samples new literature on traditional topics, such as Stalin's rise to power, methods of rule, and foreign policies, as well as scholarship in newly emerging fields. These areas include social history, gender and the family, cinema and popular culture, nationalities, patron-client relations, and the history of science.

HIST 647. Studies in Maritime History. 3 Credits.

Lecture 3 hours; 3 credits. The seminar will explore the major recent developments in maritime historiography. The course will explore how maritime history both presents unique understandings of human history while also working within or redefining broader historical constructs. Students must learn to recognize and analyze historical interpretations and develop, write, and present their own interpretations of primary sources related to a specific topic of local maritime history.

HIST 650. Studies in Ancient History. 3 Credits.

Seminar; 3 credits.

HIST 652. Studies in Medieval History. 3 Credits.

Seminar; 3 credits.

HIST 654. Studies in European History from 1350-1600. 3 Credits.

Seminar; 3 credits.

HIST 656. Studies in European History from 1600-1815. 3 Credits.

Seminar; 3 credits.

HIST 658. Studies in European History from 1815-1914. 3 Credits.

Seminar; 3 credits.

HIST 660. Studies in European History from 1914 to the Present. 3 Credits.

Seminar; 3 credits.

HIST 662. North Atlantic Resources. 3 Credits.

This class will examine how coastal societies around the North Atlantic have developed their use of fish stocks and other marine resources since the late medieval period. Furthermore it will analyze how and why fisheries led to a more or less complete over-fishing of nearly all major species and how international agreements were negotiated to secure a sustainable use of the biological resources of the oceans as common heritage of mankind.

HIST 668. Internships in History. 3 Credits.

Seminar; 3 credits. Minimum of 120 hours. Student works with professionals in areas such as museum management, archives administration, historical editing, historical preservation, electronic records management, archaeology, or oral history. Students will be supervised by a graduate faculty member, who will assign academic reading and written work, such as an historiographic essay, research paper, or final project. Individually arranged.

HIST 675. M.A. Exam Preparation and Research. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: permission of the graduate program director. This advanced seminar integrates the skills needed to pass the M.A. exam in history. Exercises include designing examination reading lists, learning the historiography of the exam fields, preparing for orals, and writing and evaluating a practice exam. This course is not open to students pursuing the thesis option.

HIST 695. Topics in History. 1-3 Credits.

1-3 credits.

HIST 696. Tutorial in Maritime History. 3 Credits.

Individually arranged with appropriate professor and with permission of the graduate program director. Prerequisite: HIST 647.

HIST 697. Tutorials in History. 1-3 Credits.

1-3 credits. Individually arranged with appropriate professor and with the permission of the graduate program director.

HIST 698. Thesis. 3 Credits.

3 credits.

HIST 699. Thesis. 3-9 Credits.

3-9 credits.

HIST 718. Mao's China. 3 Credits.

Lecture 3 hours; 3 credits. This reading seminar will focus on the changes of the Chinese society since the beginning of the 20th century. It will examine the pivotal historical events that led to the Chinese revolution, which put Mao's Communist regime in power and has changed Chinese society ever since. While studying the history chronologically, students will identify issues and factors that affect the Chinese political system and society, and examine the legacies of Mao's revolution from social and individual perspectives. The course will also focus on political formation and transformation of the government, social structure and upheavals, economic reforms, and foreign policies. (cross listed with IS 718/818).

HIST 755. Conflict and Violence in Modern Africa. 3 Credits.

Lecture 3 hours; 3 credits. This course will confront the theme of conflict and violence in Africa since the mid-20th century. It will explore the reasons behind the level of violent conflicts in the continent today, seek to understand their larger significance, and explore ideas for conflict resolution and prevention. (cross listed with IS 755/855).

HIST 795. Selected Topics in International Studies. 1-3 Credits.

3 credits. The advanced historical study of selected topics in international studies.

HIST 998. HIST 998. 1 Credit.**HIST 999. History 999. 1 Credit.**

HLSC - Health Sciences

HEALTH SCIENCES Courses

HLSC 701. Introduction to Health Services. 3 Credits.**HLSC 702. Health Management. 3 Credits.**

This seminar will provide students with an understanding of health care organizations and effective management. Particular attention will be given to the issues of access, cost and quality.

HLSC 709. Multidisciplinary Approach to Health Services Research. 3 Credits.**HLSC 710. Research Design and Application. 3 Credits.****HLSC 712. Qualitative Research Methods. 3 Credits.****HLSC 713. Measurement of Health Phenomena. 3 Credits.**

An overview of measurement theory with emphasis on the development, testing, and refinement of norm- and criterion-referenced data collection instruments for health-related research.

HLSC 714. Theory in the Health Sciences. 3 Credits.**HLSC 746. Epidemiology. 3 Credits.**

This course examines epidemiology as a method for viewing inborn community health problems and as a body of knowledge derived from this method. Skills in using epidemiology as a method and as knowledge to solve community health problems will be included.

HLSC 764. Health Economics. 3 Credits.

Lecture 3 hours; 3 credits. This course describes the application of economic tools to analyze the operation of markets for health care and insurance. Topics covered include the consumption and costs of health care in the United States, the viewpoints of players in the health care market, and an overview of both supply and demand analysis and cost effectiveness analysis. Complexities of economics unique to health care will be detailed. Further, students will employ these principles in several case studies of current and classic issues in health economics. (Cross-listed with CHP 764).

HLSC 768. Practicum in Global Health. 2 Credits.

Global health related field placement (112 hours).

HLSC 772. Policy and Politics of Health. 3 Credits.

This course enables the student to develop a systematic and analytical framework for understanding health care policy issues. The policy process is covered in detail. Timely policy issues also are discussed.

HLSC 776. Global Health. 3 Credits.

This course will introduce the student to the political, social, cultural and ethical issues involved in disease prevention and health promotion globally. Specific emphasis will be on incidence/prevalence, morbidity/mortality, and identified health problems in specific regions and countries. This course will also identify international health prerogatives aimed at improving health status through education and intervention.

HLSC 778. Global Environmental Health. 2 Credits.

The goal of this course is to guide students with a public health perspective to develop skills to identify and analyze environmental health problems globally. The course is designed to provide knowledge on recognizing and evaluating major environmental health issues and risk factors in developed and developing countries by using group discussions and real-life case studies.

HLSC 780. Monitoring & Evaluating Global Health Programs. 2 Credits.

This course familiarizes students with the basic concepts, issues, theories, approaches and models in evaluation in a global public health context. Students in this course will begin to develop technical skills to conceptualize and design evaluations of global public health programs or projects. These practices include determining which evaluation approach to use in a given context, developing an evaluation plan and appropriate evaluation questions, determining the data needed to answer the evaluation questions and establishing reporting processes to provide information to program developers.

HLSC 782. One Health, One Medicine. 2 Credits.

This course will teach students the applications of multidisciplinary competencies towards solving human health challenges. The course will identify all areas of global health issues that require human, veterinary and environmental applications for solutions. One Health One Medicine is an important course for all students in Health or Environmental Sciences that are called upon to integrate multidisciplinary competencies as part of their education and career experiences.

HLSC 784. Key Competencies for Co-creating Sustainable Futures. 2 Credits.

This course is based in an ongoing NSF sponsored research project called the Sustainable Futures Protocol (SFP), which seeks to define and develop the key individual and collective competencies for collaboratively generating sustainable futures across global societies. This course will explore the quantitative and qualitative research on collaborative leadership and action that best addresses the challenges of climate change mitigation, adaptation, and justice as they relate to global public health.

HLSC 785. Issues and Opportunities in Global Health Research. 2 Credits.

This course focuses on global health research with an emphasis on cultural, political and economic influences on health in various regions and provides students opportunities to engage in inter-professional teamwork to brainstorm problem-based issues and establish research proposals.

HLSC 795. Topics in Health Sciences. 1-3 Credits.

Lecture, 1-3 hours; 1-3 credits. Designed to provide the advanced student with an opportunity to study independently or in small groups and investigate specific topics of current interest in health services or health sciences.

HLSC 798. Supervised Research. 1-6 Credits.

Supervised research on a specialized topic. Can be repeated.

HLSC 801. Introduction to Health Services. 3 Credits.

Lecture 3 hours; 3 credits. Focuses on the complexities involved in providing health services to populations. Presents issues related to public health, community health, urban and rural health, healthy people/communities and health care delivery in traditional and non-traditional settings.

HLSC 802. Health Management. 3 Credits.

This seminar will provide students with an understanding of health care organizations and effective management. Particular attention will be given to the issues of access, cost and quality.

HLSC 804. Methods of Program Evaluation. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: HLSC 810 or PAUP 853. Departmental approval required. Examination of various methodologies for designing and conducting public health program evaluation and research. Experimental, quasi-experimental and non-experimental procedures will be covered.

HLSC 809. Multidisciplinary Approaches to Health Services Research. 3 Credits.

Lecture 3 hours; 3 credits. Uses theory and research findings from areas such as Biology, Psychology, Sociology, Economics, Urban Studies, and Health Services to achieve an understanding of health services issues and problems. Emphasizes methods of analysis and of developing alternatives related to multidisciplinary perspectives.

HLSC 810. Research Design and Application. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: graduate-level courses in research design and statistics or permission of the instructor. Emphasis is on exploring the advantages/disadvantages and uses of non-experimental, quasi-experimental, and experimental designs in health-related research with application to management, education, and clinical practice. (cross-listed with PT 810).

HLSC 811. Quantitative Research Methods in Health Care. 3 Credits.

An applied approach to the selection and application of bivariate and multivariate statistical techniques in health services research. Emphasis is placed on handling large data sets and the use of a computer for manipulation of quantitative data. Pre- or corequisite: HLSC 710 or HLSC 810.

HLSC 812. Qualitative Research Methods. 3 Credits.

Lecture 3 hours; 3 credits. An exploration of qualitative research methods including participant observation, ethnography and the generation of grounded theory. Individual interviews and focus group methods will be covered and historical, content analysis, phenomenological and montage approaches will also be discussed. Health related examples of published research in a variety of fields will be utilized to exemplify the methods.

HLSC 813. Measurement of Health Phenomena. 3 Credits.

An overview of measurement theory with emphasis on the development, testing, and refinement of norm- and criterion-referenced data collection instruments for health-related research. Prerequisites: graduate-level courses in research design and statistics or permission of the instructor.

HLSC 814. Theory in the Health Sciences. 3 Credits.

Lecture 3 hours; 3 credits. Introduces the philosophy of science by studying the nature and purposes of theory for the health sciences. Standards for evaluation of theories will be described. Selected theories and supporting research from the health services literature will be discussed and critically evaluated.

HLSC 815. Decision Analysis in Health Care. 3 Credits.

Lecture 3 hours; 3 credits. This course teaches students the art and science of decision making. It covers expected utility theory, decision tree analysis, cost-benefit analysis, and the psychological aspects of the decision-making process in the context of health policy research.

HLSC 820. Health Care Delivery System. 3 Credits.

Lecture 3 hours; 3 credits. This course provides the student with an opportunity to analyze the American health care system. The health care system is composed of complex organizational dynamics and structures which predicate the interaction between the major components of the system: personnel who provide service; institutions in which care is provided; financing mechanisms which pay for care; and the government which attempts to regulate it. This course is designed for in-depth analysis and synthesis of all aspects of health care delivery with an emphasis on improving the delivery and access to care.

HLSC 846. Epidemiology. 3 Credits.

This course examines epidemiology as a method for viewing inborn community health problems and as a body of knowledge derived from this method. Skills in using epidemiology as a method and as knowledge to solve community health problems will be included.

HLSC 864. Health Economics. 3 Credits.

Lecture 3 hours; 3 credits. This course describes the application of economic tools to analyze the operation of markets for health care and insurance. Topics covered include the consumption and costs of health care in the United States, the viewpoints of players in the health care market, and an overview of both supply and demand analysis and cost effectiveness analysis. Complexities of economics unique to health care will be detailed. Further, students will employ these principles in several case studies of current and classic issues in health economics. (Cross-listed with CHP 764).

HLSC 868. Internship in Health Sciences. 3 Credits.

3 credits. Supervised health services field experiences or health sciences laboratory experiences. A completed research project which is publishable or presentable at a professional conference is required to complete the course.

HLSC 872. Policy and Politics of Health. 3 Credits.

This course enables the student to develop a systematic and analytical framework for understanding health care policy issues. The policy process is covered in detail. Timely policy issues are also discussed.

HLSC 873. Development of Grants and Contracts in the Health Professions. 3 Credits.

Lecture 3 hours; 3 credits. Designed as a “hand-on” approach in effective grantsmanship, this course will guide the student from the identification of potential funding sources through proposal development. Highlights include program planning, nonprofit status, governmental/foundation corporate trends, local resources and grants administration.

HLSC 875. Comprehensive Health Planning. 3 Credits.

Lecture 3 hours; 3 credits. This course emphasizes the principles and processes of program planning, including a consideration of objectives, priorities, policy choices, assessment of resources, implementation, and evaluation. The student will gain practical experience in program development by developing a planning document.

HLSC 876. Global Health. 3 Credits.

This course will introduce the student to the political, social, cultural and ethical issues involved in disease prevention and health promotion globally. Specific emphasis will be on incidence/prevalence, morbidity/mortality, and identified health problems in specific regions and countries. This course will also identify international health prerogatives aimed at improving health status through education and intervention.

HLSC 881. Dissertation Seminar. 3 Credits.

3 credits. This course will assist students in developing a dissertation proposal. Steps in the research process will be reviewed as students submit drafts of their proposal for faculty and peer review. Problem formulation, integrating theoretical frameworks, preparing for human subjects review and outlining data analysis techniques for hypothesis testing will be discussed. Students will be introduced to University guidelines related to dissertations and other resources to assist them in their task.

HLSC 889. Colloquium I. 1 Credit.

Lecture 1 hour; 1 credit. Grading: Pass/Fail.

HLSC 890. Colloquium II. 1 Credit.

Lecture 1 hour; 1 credit. Grading: Pass/Fail.

HLSC 891. Colloquium III. 1 Credit.

1 credit. This course is the third in a series of colloquial courses in which doctoral level students receive presentations and present research and current topics of interest in health related professions.

HLSC 892. Colloquium IV. 1 Credit.

1 credit. This course is the fourth in a series of colloquial courses in which doctoral level students receive presentations and present research and current topics of interest in health related professions.

HLSC 893. Colloquium V. 1 Credit.

This is the fifth in a series of colloquial courses in which doctoral level students receive presentations and present research and current topics of interest in health related professions.

HLSC 894. Colloquium VI. 1 Credit.

1 credit. This is the sixth in a series of colloquial courses in which doctoral level students receive presentations and present research and current topics of interest in health related professions.

HLSC 895. Topics in Health Sciences. 1-3 Credits.

Designed to provide the advanced student with an opportunity to study independently or in small groups and investigate specific topics of current interest in health services. Prerequisites: Ph.D. standing or permission of the graduate program director.

HLSC 898. Supervised Research. 1-6 Credits.

Supervised research on a specialized topic. Can be repeated.

HLSC 899. Dissertation. 1-12 Credits.

1-12 credits. Available for pass/fail grading only. An approved research project written under the supervision of a faculty advisor, in which the student demonstrates the capacity to design and complete independent applied research. The completed project must be approved by the dissertation committee.

HLSC 999. Health Sciences 999. 1 Credit.

1 credit. A one-hour pass/fail registration required of all graduate students to maintain active status during the final semester prior to graduation. After successfully passing the candidacy examination, all doctoral students are required to be registered for at least one graduate credit each term until the degree is complete.

HLTH - Health

HEALTH Courses

HLTH 595. Topics in Health. 1-3 Credits.**HLTH 697. Independent Study. 3 Credits.**

HMS - Human Movement Sciences

HUMAN MOVEMENT SCIENCES Courses

HMS 601. Adapted Physical Education Design and Supervision. 3 Credits.

Lecture 3 hours; 3 credits. This course is divided into three sections. First section deals with learning how to administer and interpret several evaluation tools. Second section concentrates on developing computer, video taping, and other technology skills for adapted PE. Third section focuses on overall supervision of adapted PE programs in various school and institutional environments.

HMS 605. Principles of Movement Analysis in Team Sports for Physical Education. 3 Credits.

Lecture 3 hours; 3 credits. The course is designed to help teachers and coaches improve their skills in analyzing movement skills in team sports activities. Such skill analysis is necessary to effectively diagnose movement deficiencies, prescribe techniques for improving performance, and modifying activities for the adaptive program.

HMS 606. Planning and Administration of an Effective Health and Physical Education Program. 3 Credits.

Lecture 3 hours; 3 credits. Research in sport pedagogy has revealed that good teachers possess competencies in communication, classroom management, discipline, and organization different from less effective teachers. Students in this course will examine the literature in support of effective teaching behaviors and practice techniques designed to improve classroom communication skills.

HMS 607. Principles of Movement Analysis in Individual Sports for Physical Education. 3 Credits.

Lecture 3 hours; 3 credits. The course is designed to help teachers and coaches improve their skills in analyzing movement skills in individual sports activities. Such skill analysis is necessary to effectively diagnose movement deficiencies, prescribe techniques for improving performance, and modifying activities for the adaptive program.

HMS 609. Principles of Movement Analysis in Dance and Rhythmic Activities for Physical Education. 3 Credits.

Lecture 3 hours; 3 credits. The course is designed to help teachers and coaches improve their skills in analyzing movement skills in dance and rhythmic activities. Such skill analysis is necessary to effectively diagnose movement deficiencies, prescribe techniques for improving performance, and modifying activities for the adaptive program.

HMS 617. Athletic Training - Physical Assessment of the Human Body. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: students must be admitted into graduate athletic training program. The assessment of the bodily functions/systems as they relate to the care of the athlete. Major areas of concentration include ears, eyes, nose, throat, heart, lungs, g-i tract and urinary tract.

HMS 621. Strength and Conditioning Applications. 3 Credits.

Lecture 3 hours; 3 credits. A study of the principles and techniques utilized in optimizing physical performance and reducing injury through proper and effective strength and conditioning programs. Special emphasis will be placed on current research findings, breakthrough techniques and advanced weight training techniques, and popular conditioning practices.

HMS 622. Contemporary Issues in Athletic Training. 2 Credits.

Lecture 2 hours; 2 credits. Designed to expose the student to current and up to date ideas and techniques in the area of athletic training.

HMS 627. Advanced Orthopaedic Evaluation and Assessment. 1 Credit.

Laboratory 2 hours; 1 credit. Advanced techniques in the assessment of the extremities.

HMS 630. Exercise Physiology. 3 Credits.

3 credits. Prerequisite: EXSC 509 or equivalent. Review of current physiological literature related to muscular exercise including the cardiovascular-respiratory system, metabolic effects of exercise, neuromuscular relationships, and the effects of training or diet, environment, ergogenic aids, temperature, attitude, and other factors on performance and health.

HMS 635. Research Methods in Health, Physical Education, Recreation and Sports. 3 Credits.

3 credits. Types of research, selection of problems, location of research information, collection and classification of data, organization, presentation and interpretation of materials.

HMS 636. Research Problems in Health, Physical Education, Recreation and Sports. 3 Credits.

3 credits. Prerequisite: HMS 635; taken in the last semester of graduate work. Practice in the use of statistical and analytical techniques in solving problems in education; supervised student research.

HMS 642. Clinical Exercise Testing and Prescription. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: HMS 630. Principles of diagnostic exercise assessment, cardiovascular physiology, electrocardiography, ACSM guidelines to exercise testing and prescription for symptomatic and asymptomatic populations.

HMS 643. Athletic Training Practicum III. 1 Credit.

1 credit. Designed to provide practical experience in the athletic training setting and an understanding of evidence-based practice in the sports medicine setting.

HMS 649. Clinical Methods in Athletic Training. 3 Credits.

Lecture 3 hours; 3 credits. Stresses clinical techniques involved in the use of therapeutic modalities, muscle energy, and various rehabilitative concepts.

HMS 661. Seminar in Nutrition for Sports and Health. 3 Credits.

3 credits. This course is an in-depth analysis of the role of nutrition in health and human physical and athletic performance. General areas covered include the role of the six major classes of nutrients in health and sport, physiologic and metabolic interrelationships, malnutrition, nutrition in growing and aging, and diet and nutrition in the prevention of disease.

HMS 667. Internship in Health, Physical Education, Recreation and Sports. 1-6 Credits.

1-6 credits. Prerequisite: completion of 75% of graduate work. Designed to provide detailed practical experience (400 clock hours) in one of the areas of health education, physical education, recreation and sports. Required of all students entering the administrative emphasis areas without a minimum of one year full-time administrative experience.

HMS 670. Administrative Principles for Recreation, Sport, Health and Physical Education. 3 Credits.

Lecture 3 hours; 3 credits. Director responsibility in recreation, sport, health and physical education; development of an understanding of the administrative and supervisory competencies required of directors in health, physical education, recreation and sport.

HMS 680. Problems in Health Education. 3 Credits.

Lecture 3 hours; 3 credits. Problems in teaching health education on the elementary and secondary level; family life education, substance use and abuse, and mental and emotional health.

HMS 695. Topics in Health, Physical Education, Recreation and Sport. 1-3 Credits.

1-3 credits. Selected topic courses in health and physical education, sport management, and exercise science and wellness.

HMS 697. Independent Study. 1-3 Credits.

1-3 credits. Investigations in health, physical education, recreation, and sport. Problems approved in advance are investigated under the supervision of the faculty advisor.

HMS 698. Thesis. 3-6 Credits.

3-6 credits. Prerequisite: permission of the advisor and committee.

HMS 699. Thesis. 3-6 Credits.

3-6 credits. Prerequisite: permission of the advisor and committee.

HMS 718. Applied Coaching Theory. 3 Credits.

Lecture, 3 hours; 3 credits. This course is designed to give coaches more in-depth coaching knowledge and skills to become more successful in their profession. Emphasis will be placed on understanding the differing coaching strategies and ethical issues in sport, establishing personal philosophies, preparing for job opportunities, designing effective practice and game plans, understanding the different learning levels and styles and observing, analyzing, and critiquing skills. Current research within the students' chosen sports will also be explored.

HMS 719. Organization and Administration in Coaching. 3 Credits.

Lecture, 3 hours; 3 credits. This course is designed to give coaches more in-depth information about the organizational and administrative issues that coaches encounter. Content includes, but is not limited to, safety and injury prevention, contest management matters, field/facility maintenance, budgetary considerations (recruiting, scholarship decisions, fundraising, travel, equipment), public relations and human resource responsibilities (media, parents, administration, assistant coaches, AT, managers, captains), and legal and risk management procedures associated with coaching.

HMS 720. Curriculum Development in Physical Education. 3 Credits.

Lecture 3 hours; 3 credits. A course designed to acquaint the student with the basic principles and practices in curriculum development. Curriculum development methodologies for both K-12 and college curriculum will be addressed.

HMS 721. Motivational Issues in Sports. 3 Credits.

Lecture, 3 hours. 3 credits. Motivational and psychological issues relate with sport performance enhancement, athlete/student wellbeing, and clinical issues with specific populations.

HMS 725. Clinical Biomechanics for Rehabilitation Professionals. 3 Credits.

Lecture 3 hours; 3 credits. This course will include advanced theories of biomechanics, pathomechanics, and clinical anatomy relevant to the rehabilitation process of the physically active. Specific rationale will be discussed concerning mechanical properties of musculoskeletal tissues including: structure, function, mechanical properties, healing process, and factors affecting mechanical and healing properties. Participants will examine current and traditional literature from various academic disciplines, including biomechanics, engineering, neuroscience, exercise science, physical education, neurology, and rehabilitation to identify ways this information may be applied to athletic training and related orthopaedic rehabilitation disciplines. Application is stressed as related to the biomechanics, pathomechanics, and functional anatomy for dimensions of movement and athletic performance.

HMS 727. Advanced Biomechanics. 3 Credits.

Study of the relationships among mechanics, energetics and control of human movement. Emphasis will be placed on the application of mechanical concepts in biomechanics research. Prerequisite: EXSC 417W or EXSC 517.

HMS 730. Advanced Cardiovascular Exercise Physiology. 3 Credits.

A study of the physiology and pathophysiology of the cardiovascular system. Effects of exercise on the system will also be discussed. Prerequisite: HMS 630.

HMS 738. Exercise Endocrinology. 3 Credits.

This course will focus on the endocrine responses to acute and chronic exercise and how neuroendocrine function relates to health and athletic performance. Emphasis is placed on the role of the endocrine system in regulating substrate utilization during exercise, energy balance, skeletal muscle plasticity, reproductive function, and the aging process. Prerequisites: HMS 630.

HMS 739. Current Research in Motor Development. 3 Credits.

Lecture 3 hours; 3 credits. This course will examine the current theories and research relating to qualitative and quantitative changes in motor skills. Attention will be given to structuring learning experiences to maximize development. The perspective will include the entire life span.

HMS 740. Principles and Concepts of Motor Learning. 3 Credits.

Lecture 3 hours; 3 credits. This course will include analysis of motor learning theories and selected factors as they affect the development of motor skills. Practical application and research potential will be included throughout the course to enhance the depth and breadth of motor learning knowledge. The course is designed to teach students the advanced principles and concepts of motor learning so they might apply it to their clinical and research endeavors.

HMS 745. Assessment and Evaluation in Physical Education. 3 Credits.

Lecture 3 hours; 3 credits. This course is designed to acquaint the student with tests and measurement instruments in the fields of health and physical education, test construction, scoring, and methods of interpreting test results. Methodologies for both K-12 and college classes will be included.

HMS 815. Introduction to Doctoral Study Seminar. 3 Credits.

Lecture 3 hours; 3 credits. This course explores current issues and trends in all aspects of human movement science and relates theory to practice.

HMS 816. Research Experience I. 3 Credits.

Lecture 3 hours; 3 credits. Determination of a research project through the review of literature. Course encompasses formulation of a topic along with the design of a research study.

HMS 817. Research Experience II. 3 Credits.

Lecture 3 hours; 3 credits. Supervised research implementation, data collection, and project completion of specific topic within curriculum and instruction or applied kinesiology concepts.

HMS 820. Curriculum Development in Physical Education. 3 Credits.

Lecture 3 hours; 3 credits. A course designed to acquaint the student with the basic principles and practices in curriculum development. Curriculum development methodologies for both K-12 and college curricula will be addressed.

HMS 825. Clinical Biomechanics for Rehabilitation Professionals. 3 Credits.

Lecture 3 hours; 3 credits. This course will include advanced theories of biomechanics, pathomechanics, and clinical anatomy relevant to the rehabilitation process of the physically active. Specific rationale will be discussed concerning mechanical properties of musculoskeletal tissues including: structure, function, mechanical properties, healing process, and factors affecting mechanical and healing properties. Participants will examine current and traditional literature from various academic disciplines, including biomechanics, engineering, neuroscience, exercise science, physical education, neurology, and rehabilitation to identify ways this information may be applied to athletic training and related orthopaedic rehabilitation disciplines. Application is stressed as related to the biomechanics, pathomechanics, and functional anatomy for dimensions of movement and athletic performance.

HMS 827. Advanced Biomechanics. 3 Credits.

Study of the relationships among mechanics, energetics and control of human movement. Emphasis will be placed on the application of mechanical concepts in biomechanics research. Prerequisite: EXSC 417W or EXSC 517.

HMS 830. Advanced Cardiovascular Exercise Physiology. 3 Credits.

A study of the physiology and pathophysiology of the cardiovascular system. Effects of exercise on the system will also be discussed. Prerequisite: HMS 630.

HMS 838. Exercise Endocrinology. 3 Credits.

This course will focus on the endocrine responses to acute and chronic exercise and how neuroendocrine function relates to health and athletic performance. Emphasis is placed on the role of the endocrine system in regulating substrate utilization during exercise, energy balance, skeletal muscle plasticity, reproductive function, and the aging process. Prerequisites: EXSC 630.

HMS 839. Current Research in Motor Development. 3 Credits.

Lecture 3 hours; 3 credits. This course will examine the current theories and research relating to qualitative and quantitative changes in motor skills. Attention will be given to structuring learning experiences to maximize development. The perspective will include the entire life span.

HMS 840. Principles and Concepts of Motor Learning. 3 Credits.

Lecture 3 hours; 3 credits. This course will include analysis of motor learning theories and selected factors as they affect the development of motor skills. Practical application and research potential will be included throughout the course to enhance the depth and breadth of motor learning knowledge. The course is designed to teach students the advanced principles and concepts of motor learning so they might apply it to their clinical and research endeavors.

HMS 845. Assessment and Evaluation in Physical Education. 3 Credits.

Lecture 3 hours; 3 credits. This course is designed to acquaint the student with tests and measurement instruments in the fields of health and physical education, test construction, scoring, and methods of interpreting test results. Methodologies for both K-12 and college classes will be included.

HMS 855. Neuroanatomical Basis of Human Movement. 3 Credits.

Lecture 3 hours; 3 credits. This course will include advanced theories of anatomy, biomechanics, motor control, and movement disorders. It will emphasize neuroanatomical mechanisms that apply to the processes of voluntary movement. The select topics include: basic functional anatomy, physical and chemical foundations of brain and spinal cord, muscle reflexes and spinal connections, muscle contraction mechanics, and sensorimotor system overview.

HMS 890. Doctoral Studies Seminar. 3 Credits.

Students will be introduced to expectations of conducting research, explore concepts associated with becoming a faculty member or practitioner with an earned doctorate, and become familiar with campus resources. Students will learn and apply concepts related to scientific writing. This course will include extensive reading of research articles, grant applications, and other scholarly work. Also, this course will investigate the need for professional development. This will include familiarizing oneself with appropriate professional organizations, exploring the benefits and challenges of collaboration, interviewing and preparing for job placements, and preparing a curricular vitae and teaching philosophy.

HMS 891. Doctoral Research Seminar. 3 Credits.

Students are introduced to the main philosophical traditions of research and scholarship that currently inform scientific inquiry in Human Movement Sciences with a specific focus on the preparation of a research proposal.

HMS 895. Topics. 1-3 Credits.

Lecture 3 hours; 1-3 credits.

HMS 897. Readings and Research in Content Area. 3 Credits.

3 credits. Independent study with a faculty member. A guided review of the literature to determine the history, development, and issues of areas within human movement sciences, curriculum and instruction and applied kinesiology.

HMS 898. Dissertation Research. 1-3 Credits.

1-3 credits. Determination of a research project through the review of literature. Course encompasses formulation of a topic along with the design of a research study.

HMS 899. Dissertation. 1-12 Credits.

1-12 credits. Prerequisite: permission of dissertation committee chair. Work on pre-selected dissertation topic under the direction of dissertation chair.

HMS 999. Exercise Science, Sport, Physical Education and Recreation 999. 1 Credit.

1 credit. A one-credit pass/fail registration required of all graduate students to maintain active status during the final semester prior to graduation. After successfully passing the candidacy examination, all doctoral students are required to be registered for at least one graduate credit each term until the degree is complete.

HMSV - Human Services

HUMAN SERVICES Courses

HPRO - Health Promotion

HEALTH PROMOTION Courses

HPRO 650. Health Promotion and Education Methods and Materials. 3 Credits.

Lecture 3 hours; 3 credits. This course covers community health methods and strategies at the individual and community levels, teaching/learning styles, learning process, group dynamics, needs assessment, health literacy, adult learning principles, and teaching roles of the health professional. This course is designed to meet the needs of the health professional in the areas of patient instruction, educational programs, and continuing education.

HPRO 660. Program Planning and Evaluation. 3 Credits.

Lecture 3 hours; 3 credits. This course examines the application of evaluation skills for community health programs. The course is designed to assist students in identifying and gaining proficiency in the skills of designing, organizing, coordinating, and evaluating health education programs.

HPRO 670. Cultural Issues in Health Promotion and Education. 3 Credits.

Lecture 3 hours; 3 credits. This course provides an introduction for multicultural communication for health promotion and disease management. The topics include how to work collaboratively in diverse groups with an understanding of health behaviors, values, and health benefits.

HUM - Humanities

HUMANITIES Courses

HUM 595. Topics in Humanities. 1-3 Credits.

1-3 credits. Advanced study of selected topics designed for small groups of qualified students to work on subjects of mutual interest which may not be offered regularly. These courses will appear in the course schedule and will be more fully described in information distributed to academic advisors.

HUM 597. Tutorial Work in Humanities. 1-3 Credits.

1-3 credits. Independent reading and study on a topic selected under the direction of an instructor.

HUM 601. Introduction to the Humanities. 3 Credits.

Lecture, 3 hours. 3 credits. This class introduces students to the study of the humanities with a focus on the enduring questions and ideas of human history. These include questions of culture, reality, society, power, truth, communication, and mediation. Students address these questions and ideas by engaging with some of the great works of social theory from the twentieth century.

HUM 602. Theory and Methods in Humanities. 3 Credits.

Lecture 3 hours; 3 credits. This class instructs students in various theoretical and methodological approaches for conducting research within the humanistic disciplines. Students will become familiar with literary theory, critical/cultural studies, historical methods, qualitative social scientific approaches, and visual studies, as well as the conduct of research across disciplinary boundaries.

HUM 603. Preparing Humanities Teachers & Scholars Pro-seminar. 3 Credits.

The purposes of the pro-seminar are A)to help prepare Humanities graduate students to teach discipline-specific college-level introductory courses from an interdisciplinary perspective, and B)to provide Humanities students with opportunities to engage scholars who are producing new work across a range of disciplines, in turn learning to present their own research in public.

HUM 604. Debates in the Digital Humanities. 3 Credits.

This class will emphasize the ways in which the digital humanities intersects with critical theory and cultural studies approaches to studying digital media. Students will gain an understanding of the emerging role of the digital humanities across several academic disciplines. The course employs an experimental immersive learning component. Prerequisites: HUM 601 and departmental approval.

HUM 630. The Information Society. 3 Credits.

Lecture 3 hours; 3 credits. This course explores the theories, questions, claims and myths that have accompanied the rise of new communication technologies and electronically derived digital information that define the "Electronic Revolution," also known as the Information Society. (cross-listed with COMM 630).

HUM 640. Television and Politics. 3 Credits.

Lecture 3 hours; 3 credits. This class closely examines television's role in shaping and reflecting contemporary American political culture, the conduct of foreign policy, and formal political processes, such as elections. (cross-listed with COMM 640).

HUM 657. Introduction to American Popular Culture. 3 Credits.

Lecture 3 hours; 3 credits. This course introduces students to the history and diversity of popular culture forms, industries, criticism, and debates in the United States. The course is interdisciplinary, with a focus on the relationship of cultural hierarchy to social and national identity.

HUM 668. Internship. 3 Credits.

3 credits. This course allows graduate students in Humanities to pursue a structured work experience in a field relevant to a student's course of study. Student will work with a supervisor at the work site and a faculty advisor in Humanities. Requirements include a formal essay connected to the experience, portfolio, and satisfactory evaluation by the supervisor. Permission of Humanities director required. Pass/fail grading only.

HUM 692. Humanities Thesis and Non-Thesis Preparation. 3 Credits.

This class is designed to prepare students for completion of their final projects in the program. The class is designed to teach students how to conduct research. Students workshop their projects as they are being developed. It also teaches students to navigate the various institutional requirements for completing this work. Prerequisites: HUM 601, HUM 602, HUM 603, and departmental approval.

HUM 693. Non-Thesis Project. 3 Credits.

Students have the option of creating a theoretically-informed final project instead of a traditional thesis. Individual projects must be approved by the program director, but can include creative works, art installations, film and video, interactive and born-digital works, as well as other forms of community engagement. Projects are developed with help of supervisor. Prerequisites: HUM 601, HUM 602, HUM 603, HUM 604, HUM 692 and departmental approval.

HUM 694. Interdisciplinarity and the Humanities: Theory and Practice. 3 Credits.

Lecture/seminar 3 hours; 3 credits. Prerequisites: HUM 601, 602. The capstone seminar for non-thesis humanities students. The seminar provides a forum in which to discuss contemporary theories and questions concerning interdisciplinary humanities research. Students will also develop and complete a research paper which reflects their own interdisciplinary programs of study.

HUM 696. Special Topics in Humanities. 1-3 Credits.

1-3 credits. Prerequisite: permission of the instructor. Appropriate advanced study of small groups on special topics selected under the direction of an instructor. Conferences and papers as appropriate.

HUM 697. Tutorial Work in Humanities. 1-3 Credits.

1-3 credits. Prerequisite: permission of the instructor. Independent reading and study on a topic to be selected under the direction of an instructor. Conferences and papers as appropriate.

HUM 698. Thesis. 3 Credits.

3 credits. Prerequisites: HUM 601 and 602.

HUM 699. Thesis. 3,6 Credits.

3 or 6 credits. Course requirement for thesis option.

HUM 795. Topics. 3 Credits.

Special topics.

HUM 796. Topics. 3 Credits.

Special topics.

HUM 797. Tutorial Work in the Humanities. 1-3 Credits.

1-3 credits. Independent reading and study under the direction of an instructor on a topic to be selected.

HUM 895. Topics. 3 Credits.

Special topics.

HUM 896. Topics. 3 Credits.

Special topics.

HUM 897. Tutorial Work in the Humanities. 1-3 Credits.

1-3 credits. Independent reading and study under the direction of an instructor on a topic to be selected.

HUM 999. Humanities 999. 1 Credit.

HPE - Health Physical Education

HEALTH PHYSICAL EDUCATION Courses

HPE 506. Tests and Measurement in Physical Education and Health. 3 Credits.

This course is designed to acquaint the student with tests and measurement in the fields of health and physical education, test construction, scoring, and methods of using results.

HPE 530. Teaching Wellness and Health-Related Fitness. 3 Credits.

The study of techniques for the teaching of wellness and health-related fitness. Content to be covered includes drug education, nutrition, wellness, mental health, and various aspects of fitness training appropriate for the teaching of PreK-12 physical education and health.

HPE 587. Teacher Candidate Seminar. 1 Credit.

Prerequisites: acceptance into teacher education and approval of the program advisor. Study and group discussion of problems growing out of the student teaching (teacher candidate internship) experience. Students must pass Praxis II to complete this course.

HPE 597. Topics in Health and Physical Education. 1-3 Credits.

HPE 598. Topics in Health and Physical Education. 1-3 Credits.

HPE 698. Thesis. 3 Credits.

HPE 699. Thesis. 3 Credits.

IDT - Instructional Design and Technology

INSTRUCTIONAL DESIGN AND TECHNOLOGY Courses

IDT 575. Web Development for Educators. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: graduate standing. Provides both a conceptual framework and hands-on experience in the design and development of online web resources for educators. The course introduces the student to the various uses and features of online tools and technologies, investigates online learning strategies, and explores best practices in the use of the web to enhance learning. Topics include fundamentals of web authoring: screen design, use of web page creation tools, and functional use of HTML and derivatives.

IDT 617. Foundations of Instructional Technology. 3 Credits.

Lecture 3 hours; 3 credits. Required introductory overview to the field of instructional technology. Topics include a history of the field, basic instructional design, generally accepted theoretical practices and major formats of instructional media. Emphasis is given to instructional technology trends as applied to various industries, including K-12, military, industry training, and others.

IDT 715. Management of Technology Resources in the Classroom. 3 Credits.

Lecture, 3 hours. 3 credits. Surveys computing technology with a focus on management in educational contexts. Implementation, integration and resourcing will be covered.

IDT 725. Human Performance Assessment. 3 Credits.

Lecture, 3 hours. 3 credits. Prerequisite: FOUN 722 or equivalent. This course focuses on the theory, design, and evaluation of measurement instruments used to assess individual knowledge, performance, and attitudes. Topics include fundamentals of measurement, reliability, validity, and instrument selection, construction, and use. Students will develop and evaluate instruments for instructional and research purposes.

IDT 730. Principals and Practice of Human Performance Technology. 3 Credits.

Lecture 3 hours. 3 credits. This course explores both the principles and practices of human performance technology, with roughly equal emphasis on both. Students will learn what HPT is, how it's applied in practice, and how and why instructional designers need to know about it. Particular emphasis is given to determining whether or not problems are best amenable to instructional solutions.

IDT 735. Knowledge Management. 3 Credits.

Lecture, 3 hours. 3 Credits. This seminar focuses on what knowledge management is and how and why knowledge management is relevant for instructional designers. Emphasis is placed on theoretical approaches to knowledge management, though we will touch upon the design of knowledge management systems.

IDT 737. Consulting Skills for Instructional Designers. 3 Credits.

Lecture, 3 hours. 3 credits. This project-based course is designed to develop and enhance the ability of instructional designers to work as partners and consultants to clients and superiors. The focus is on consulting skills per se, and not any particular content. All students will be required to do an individual consulting project, supervised by the instructor.

IDT 739. Needs Analysis and Assessment. 3 Credits.

Lecture, 3 hours; 3 credits. This project-based class will focus on the process of doing a needs analysis and assessment, from start to finish. Although theoretical considerations regarding needs analyses will be explored, the emphasis is on actually conducting the analysis. Students will work in teams under the supervision of the instructor to conduct a needs analysis for an external client.

IDT 742. Task Analysis Methods. 3 Credits.

Lecture, 3 hours; 3 credits. This project-based course examines several different task analysis methodologies. Major methodologies common in the field will be explored as a class, and students will also be required to familiarize themselves with other methodologies of their choice. Emphasis will be on practical application of the methodologies, especially as regards instructional products or systems.

IDT 746. Foundations of Distance Education. 3 Credits.

Lecture 3 hours; 3 credits. An analysis of the trends, issues, and theories of distance education in education, business, and military applications. Students will examine various distance education systems, policies and lessons from different perspectives.

IDT 748. Instructional Technology Product Evaluation. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: IDT 749/849. Provides an overview to the science of evaluation, both as a general field and as applied to instruction. Topics will include evaluating the effectiveness of learning technologies; building survey instruments; online and computer-assisted testing; reporting practices; as well as formative, summative program and performance evaluation and assessment. The unique demands of evaluating mediated education and learning environments will be considered.

IDT 749. Instructional Systems Design. 3 Credits.

Lecture 3 hours; 3 credits. Students will gain hands-on experience applying a theoretical understanding of instructional design and development to actual projects. Students will learn and use the Instructional Systems Design Process from initial learner profile analysis to design and development through to evaluation. Students will work individually and in teams to gain experience similar to real-world instructional design situations. Students will master the fundamental practices upon which the instructional design process is based.

IDT 751. Computer-Based Multi-Media Design. 3 Credits.

Lecture, 3 hours. 3 credits. Prerequisite: IDT 749/849. This course covers the theory, design, and evaluation of computer-based multimedia instruction. Students will demonstrate a thorough understanding of instructional theory and design strategies for computer-based drills, tutorials, hypermedia, simulations, games, tools, open-ended learning environments, tests, and web-based instruction. Class projects will center on the design and development of instruction utilizing at least two of these methodologies.

IDT 752. Diffusion and Adoption of Instructional Technology Innovations. 3 Credits.

Lecture 3 hours; 3 credits. This course will explore theories, research, and strategies related to the diffusion and adoption of instructional technology innovations in education and training. The course will explore why and how individuals, groups, and organizations adopt or fail to adopt an innovation or change.

IDT 755. Theory and Design of Instructional Simulation. 3 Credits.

Lecture 3 hours; 3 credits. This course focuses on learning theory, design and evaluation of instructional simulations and simulators. Topics include history, instructional design, validation, and integration of instructional simulations.

IDT 756. Instructional Gaming: Theories and Practice. 3 Credits.

Lecture 3 hours; 3 credits. Provides both a conceptual framework and experience in the design and development of instructional games. The course introduces the student to the history, research, theory, and practice of instructional games. Topics include discussions of relevant learning theories associated with instructional gaming, analysis and design of games and current research in instructional gaming.

IDT 760. Cognition and Instructional Design. 3 Credits.

Lecture 3 hours; 3 credits. Students will be introduced to the theoretical frameworks that form the basis of instructional systems theory and design. Focus will be on learning theories, instructional psychology, and instructional system theory. Recent developments in cognition, learning and instruction for educators will also be considered. Topics include perspectives of behaviorism, social-historical constructivism, cognitive science, situated cognition, and cultural influences on cognition.

IDT 761. Applied Instructional Design. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: IDT 749/849. Problem-based course in which students gain experience applying knowledge from IDT 749/849 to real-world instructional and instructional technology problems. Project work is individual, paired, and in teams. Students demonstrate mastery of the instructional design and development process through production of tools, technologies, media or materials that successfully resolve an instructional problem. Focus is on rapid prototyping model.

IDT 763. Instructional Design Theory. 3 Credits.

Lecture 3 hours; 3 credits. Students will investigate traditional and contemporary instructional design theories and models. Behavioral, cognitive, generative, problem-based learning, and constructivist theories as well as cognitive hierarchies will be examined, compared, contrasted and applied to various instructional situations.

IDT 764. Theories and Research. 3 Credits.

Lecture 3 hours, 3 credits. This course is a study of the application of perceptual and learning principles to the design of instructional media for use in educational and training applications. The focus is on the development and application of heuristics from the research literature. We will examine verbal and iconic signs as well as visual imagery, and their role in the instructional and learning processes.

IDT 773. Advanced Instructional Design Techniques. 3 Credits.

Lecture 3 hours; 3 credits. Corequisite: IDT 749/849. Exploration and application of techniques, tools and competencies characteristic of expert designers. Topics may include: instructional strategies, use of design software, program design, advanced analysis techniques, motivation design, rapid prototyping, reducing design cycle time, and designing instruction for diverse learner populations.

IDT 775. Designing Online Instruction. 3 Credits.

Lecture, 3 hours. 3 credits. An applied survey of online instruction, including relevant theory and design considerations. Topics include efficacy of online learning, design considerations when using course management systems and similar online learning technologies, research and future directions.

IDT 795. Topics in Instructional Design and Technology. 3 Credits.

1-3 credits. Provides opportunities for master's and doctoral students to explore topics related to instructional design.

IDT 801. Instructional Design and Technology Seminar. 3 Credits.

Lecture 3 hours; 3 credits. Introduces new Ph.D. students to the field of instructional design and technology and provides orientation to doctoral level study. The course includes reading, critiquing and analyzing empirical research, theories, and real-world instructional problems. Potential student research agendas consistent with faculty or programmatic research foci will be explored. Academic and technological expectations will be communicated and practiced.

IDT 810. Trends and Issues in Instructional Design and Technology. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: 9 hours IDT coursework. Exploration and discussion of trends and issues of current and historical significance to instructional design. Readings will include contributions of key scholars, past and present, in instructional design and related fields. Includes analysis of trends and issues to track and predict their impact on the future of the field.

IDT 815. Management of Technology Resources in the Classroom. 3 Credits.

Lecture, 3 hours. 3 credits. Surveys computing technology with a focus on management in educational contexts. Implementation, integration and resourcing will be covered.

IDT 825. Human Performance Assessment. 3 Credits.

Lecture, 3 hours. 3 credits. Prerequisite: FOUN 722 or equivalent. This course focuses on the theory, design, and evaluation of measurement instruments used to assess individual knowledge, performance, and attitudes. Topics include fundamentals of measurement, reliability, validity, and instrument selection, construction, and use. Students will develop and evaluate instruments for instructional and research purposes.

IDT 830. Principals and Practice of Human Performance Technology. 3 Credits.

Lecture 3 hours. 3 credits. This course explores both the principles and practices of human performance technology, with roughly equal emphasis on both. Students will learn what HPT is, how it's applied in practice, and how and why instructional designers need to know about it. Particular emphasis is given to determining whether or not problems are best amenable to instructional solutions.

IDT 835. Knowledge Management. 3 Credits.

Lecture, 3 hours. 3 Credits. This seminar focuses on what knowledge management is and how and why knowledge management is relevant for instructional designers. Emphasis is placed on theoretical approaches to knowledge management, though we will touch upon the design of knowledge management systems.

IDT 837. Consulting Skills for Instructional Designers. 3 Credits.

Lecture, 3 hours. 3 credits. This project-based course is designed to develop and enhance the ability of instructional designers to work as partners and consultants to clients and superiors. The focus is on consulting skills per se, and not any particular content. All students will be required to do an individual consulting project, supervised by the instructor.

IDT 839. Needs Analysis and Assessment. 3 Credits.

Lecture, 3 hours; 3 credits. This project-based class will focus on the process of doing a needs analysis and assessment, from start to finish. Although theoretical considerations regarding needs analyses will be explored, the emphasis is on actually conducting the analysis. Students will work in teams under the supervision of the instructor to conduct a needs analysis for an external client.

IDT 842. Task Analysis Methods. 3 Credits.

Lecture, 3 hours; 3 credits. This project-based course examines several different task analysis methodologies. Major methodologies common in the field will be explored as a class, and students will also be required to familiarize themselves with other methodologies of their choice. Emphasis will be on practical application of the methodologies, especially as regards instructional products or systems.

IDT 846. Foundations of Distance Education. 3 Credits.

Lecture 3 hours; 3 credits. An analysis of the trends, issues, and theories of distance education in education, business, and military applications. Students will examine various distance education systems, policies and lessons from different perspectives.

IDT 848. Instructional Technology Product Evaluation. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: IDT 749/849. Provides an overview to the science of evaluation, both as a general field and as applied to instruction. Topics will include evaluating the effectiveness of learning technologies; building survey instruments; online and computer-assisted testing; reporting practices; as well as formative, summative program and performance evaluation and assessment. The unique demands of evaluating mediated education and learning environments will be considered.

IDT 849. Instructional Systems Design. 3 Credits.

Lecture 3 hours; 3 credits. Students will gain hands-on experience applying a theoretical understanding of instructional design and development to actual projects. Students will learn and use the Instructional Systems Design Process from initial learner profile analysis to design and development through to evaluation. Students will work individually and in teams to gain experience similar to real-world instructional design situations. Students will master the fundamental practices upon which the instructional design process is based.

IDT 851. Computer-Based Multi-Media Design. 3 Credits.

Lecture, 3 hours. 3 credits. Prerequisite: IDT 749/849. This course covers the theory, design, and evaluation of computer-based multimedia instruction. Students will demonstrate a thorough understanding of instructional theory and design strategies for computer-based drills, tutorials, hypermedia, simulations, games, tools, open-ended learning environments, tests, and web-based instruction. Class projects will center on the design and development of instruction utilizing at least two of these methodologies.

IDT 852. Diffusion and Adoption of Instructional Technology Innovations. 3 Credits.

Lecture 3 hours; 3 credits. This course will explore theories, research, and strategies related to the diffusion and adoption of instructional technology innovations in education and training. The course will explore why and how individuals, groups, and organizations adopt or fail to adopt an innovation or change.

IDT 855. Theory and Design of Instructional Simulation. 3 Credits.

Lecture 3 hours; 3 credits. This course focuses on learning theory, design and evaluation of instructional simulations and simulators. Topics include history, instructional design, validation, and integration of instructional simulations.

IDT 856. Instructional Gaming: Theories and Practice. 3 Credits.

Lecture 3 hours; 3 credits. Provides both a conceptual framework and experience in the design and development of instructional games. The course introduces the student to the history, research, theory, and practice of instructional games. Topics include discussions of relevant learning theories associated with instructional gaming, analysis and design of games and current research in instructional gaming.

IDT 860. Cognition and Instructional Design. 3 Credits.

Lecture 3 hours; 3 credits. Students will be introduced to the theoretical frameworks that form the basis of instructional systems theory and design. Focus will be on learning theories, instructional psychology, and instructional system theory. Recent developments in cognition, learning and instruction for educators will also be considered. Topics include perspectives of behaviorism, social-historical constructivism, cognitive science, situated cognition, and cultural influences on cognition.

IDT 861. Applied Instructional Design. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: IDT 749/849. Problem-based course in which students gain experience applying knowledge from IDT 749/849 to real-world instructional and instructional technology problems. Project work is individual, paired, and in teams. Students demonstrate mastery of the instructional design and development process through production of tools, technologies, media or materials that successfully resolve an instructional problem. Focus is on rapid prototyping model.

IDT 863. Instructional Design Theory. 3 Credits.

Lecture 3 hours; 3 credits. Students will investigate traditional and contemporary instructional design theories and models. Behavioral, cognitive, generative, problem-based learning, and constructivist theories as well as cognitive hierarchies will be examined, compared, contrasted and applied to various instructional situations.

IDT 864. Theories and Research. 3 Credits.

Lecture 3 hours, 3 credits. This course is a study of the application of perceptual and learning principles to the design of instructional media for use in educational and training applications. The focus is on the development and application of heuristics from the research literature. We will examine verbal and iconic signs as well as visual imagery, and their role in the instructional and learning processes.

IDT 873. Advanced Instructional Design Techniques. 3 Credits.

Lecture 3 hours; 3 credits. Corequisite: IDT 749/849. Exploration and application of techniques, tools and competencies characteristic of expert designers. Topics may include: instructional strategies, use of design software, program design, advanced analysis techniques, motivation design, rapid prototyping, reducing design cycle time, and designing instruction for diverse learner populations.

IDT 875. Designing Online Instruction. 3 Credits.

Lecture, 3 hours. 3 credits. An applied survey of online instruction, including relevant theory and design considerations. Topics include efficacy of online learning, design considerations when using course management systems and similar online learning technologies, research and future directions.

IDT 879. Research Residency in Instructional Design and Technology. 3 Credits.

An introduction to conducting instructional technology research. Students will work in consultation with their advisor to develop a proposal for a study related to instructional technology as part of their research residency that will be submitted for presentation at a nationally refereed conference or to a refereed journal.

IDT 895. Topics in Instructional Design and Technology. 3 Credits.

1-3 credits. Provides opportunities for master's and doctoral students to explore topics related to instructional design.

IDT 898. Research Residency II. 1-3 Credits.

A mentored research project by the student's advisor. Students work independently with their advisor to complete the research residency project. This course focuses on obtaining appropriate human subjects approval, collecting and analyzing data, and preparing a manuscript suitable for presentation or publication in nationally refereed journal or conference. Course may be repeated as needed, but only 3 hours may be counted toward degree requirements. Prerequisites: IDT 879.

INBU - International Business

INTERNATIONAL BUSINESS Courses

INBU 620. International Business Issues. 2 Credits.

Students will develop a deep understanding of the issues facing international firms. The course will use case studies, lectures, and simulations to highlight the cultural, organizational, and financial challenges to doing business in various regions of the world with particular emphasis on Europe, China, and India. Prerequisites: Admission to the MBA Program, MBA 600, MBA 601, MBA 602, MBA 603, and MBA 604.

INBU 630. Fundamentals of International Business. 1 Credit.

This course covers topics from management, marketing, economics, and finance that are important to the study of international business.

INBU 631. International Business Issues. 2 Credits.

This 2 hour capstone course covers topics facing international firms. This course uses a combination of case studies, lectures, and simulations to highlight the cultural, organizational, and financial challenges to doing business in various regions of the world.

IS - International Studies

INTERNATIONAL STUDIES Courses

IS 600. Research Methods in International Studies. 3 Credits.

Lecture 3 hours; 3 credits. Interdisciplinary quantitative techniques applicable to the study of international phenomena.

IS 601. Seminar in International Relations Theory. 3 Credits.

Lecture 3 hours; 3 credits. Surveys major theoretical approaches to international relations and foreign policy. A systematic introduction designed to lay a foundation for advanced graduate study.

IS 606. American Foreign Policy and World Order. 3 Credits.

This course deals with the adaptation of US foreign policies to the changing structure of the international system after WWII and in the Cold War, and since Reagan. It is designed to review, analyze, and discuss the global rise of the US role in the world. It will also assess the transformation of US interests since 1945, through the Cold War and since the events of September 11, 2001.

IS 620. Advanced Statistical Techniques for International Studies. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: IS 600. Multivariate regression, causal analysis, and advanced statistical applications.

IS 655. International History. 3 Credits.

Course explores how different societies in the 20th century were shaped by similar practices, ideas, and pressures. Course themes may include colonialism, the global history of World War II, the cold war ethnic distortion and the consumer revolution among others.

IS 668. Internship in International Studies. 1-6 Credits.

3 credits. Prerequisite: approval of the director. Individually arranged internship at local, state, national or international level.

IS 695. Topics in International Studies. 3 Credits.

Lecture 3 hours; 3 credits. The advanced study of selected (titled) topics not offered on a regular basis.

IS 696. Seminar Topics in International Studies. 3 Credits.

3 credits. The advanced study of selected topics in an interdisciplinary manner which permits small groups of qualified students to work on subjects of mutual interest. Due to their specialized nature, seminar topics may not be offered regularly.

IS 697. Independent Research in International Studies. 3 Credits.

Independent research on a topic from an interdisciplinary perspective. Students must receive prior approval from the faculty supervisor and the director.

IS 698. Directed Research. 3 Credits.

Methodological and theoretical preparation designed to assist students in writing a thesis. Prerequisites: approval of director or instructor.

IS 699. Thesis. 1-9 Credits.

1-9 credits. Writing of the thesis.

IS 701. Global Change and American Foreign Policy. 3 Credits.

Seminar, 3 hours; 3 credits. This research seminar examines the transformation of the U.S. role in the world in the global context of the 20th Century and since September 2001.

IS 702. Approaches to Collective Security. 3 Credits.

Lecture 3 hours; 3 credits. This seminar explores the origins of the idea of collective security, examines the attempts to organize international security collectively and assesses possibilities and opportunities for collective security arrangements after the Cold War.

IS 703. Ethics and International Relations. 3 Credits.

Lecture 3 hours; 3 credits. The focus of this research seminar will be on the role of normative ideas in international relations. Students will be introduced to the growing literature on normative approaches to international relations as well as the traditional literature on the practical and philosophical problems of ethical action in the relations of states. Although a number of policy applications will be considered, the primary focus will be on the theoretical incorporation of normative ideas into our understanding of state action in the anarchic international environment.

IS 704. Latin American Politics. 3 Credits.

Seminar 3 hours; 3 credits. This course examines Latin American politics from comparative and historical perspectives. Particular focus is placed on various manifestations of political authority in the region and the major societal challenges to state power. The course reviews and critiques alternative theoretical approaches to the study of state-societal relations in Latin America.

IS 705. The Euro-Atlantic Community. 3 Credits.

Seminar 3 hours; 3 credits. An examination of the Euro-Atlantic area as a partial international system since World War II; alignments and patterns within and between the members of the European "community" and the role and attitudes of the United States and leading European states to preserve and strengthen their sovereign prerogatives and influence; and the prospects for a true Euro-Atlantic community that would link the U.S. and Europe.

IS 706. The Causes of War. 3 Credits.

Lecture 3 hours; 3 credits. This research seminar will explore the theoretical and empirical literature on the causes of violent conflict between states.

IS 707. Interdependence, Power, and Transnationalism. 3 Credits.

Seminar 3 hours; 3 credits. This course covers the fundamental concepts, ideas, and approaches to the study of interdependence and transnationalism. It seeks to expose students to the nature, role, and impact of economic, technological, strategic, and cultural interdependence. Cases of interdependence and transnationalism are explored in the post-Cold War era. Some focus is placed on how interdependence and transnationalism are impacting the power of the state.

IS 709. Chinese Foreign Policy. 3 Credits.

Seminar 3 hours; 3 credits. This seminar includes an advanced survey of theoretical approaches to the study of Chinese foreign policy and in-depth analyses of the domestic/international environment, ideological principles, political/economic goals, military/diplomatic instruments, decision-making processes, and global/regional consequences of Chinese foreign policy.

IS 710. Global Environmental Policy. 3 Credits.

Lecture 3 hours; 3 credits. This seminar examines the institutions and political actors involved in global environmental policy making with emphasis on the role of the United States. In doing so, it addresses the scientific and political debate concerning the causes, consequences, and proposed solutions of selected worldwide ecological problems, including global climate change, stratospheric ozone depletion, acid rain, and loss of biodiversity among others.

IS 711. International Migration and Refugee Movement. 3 Credits.

Seminar 3 hours; 3 credits. A review of current literature and empirical issues concerning transnational migration and refugees.

IS 712. The New Germany in the New Europe. 3 Credits.

Seminar 3 hours; 3 credits. The unification of Germany and the end of the East-West conflict have changed the context within which policy is made in Europe. What kind of Europe will emerge? What kind of hierarchies will determine direction and pace of European politics? The purpose of this course is to explore the role played by Germany in the development of post-Cold War European politics.

IS 713. Global Political Economy. 3 Credits.

Seminar 3 hours; 3 credits. Analysis of the forces shaping national and transnational economic institutions and their policies on a range of contemporary issues, including North-South relations.

IS 714. Law in the International System. 3 Credits.

Lecture 3 hours; 3 credits. An introduction to the principles of international law and to the political and institutional role of law in the relations of states.

IS 715. France and New Europe. 3 Credits.

Seminar 3 hours; 3 credits. Emphasis will be placed on the transformation of French-American relations from the idyllic beginnings of the American nation to the complexities of the Cold War, to the new alignments of the new Europe and the European Union.

IS 716. Theories of Comparative Sociopolitical Studies. 3 Credits.

Lecture 3 hours; 3 credits. The fundamental goal of the course is to provide the theoretical basis for subsequent coursework and research in the comparative and regional studies track. To achieve this goal, this seminar examines major theories and debates in comparative social and political studies based on extensive and intensive literature review.

IS 717. World Population and Development. 3 Credits.

Seminar 3 hours; 3 credits. This seminar discusses population processes and their connections to socioeconomic development. A nontechnical course, the goal is to introduce students to the major concerns and issues in population and current debates over the role of population in sustainable development. It will provide students with a systematic but critical review of research findings and issues in various areas of population and development.

IS 718. Mao's China. 3 Credits.

Lecture 3 hours; 3 credits. This reading seminar will focus on the changes of the Chinese society since the beginning of the 20th century. It will examine the pivotal historical events that led to the Chinese revolution, which put Mao's Communist regime in power and has changed the Chinese society ever since. While studying the history chronologically, students will identify issues and factors that affect the Chinese political system and society, and examine the legacies of Mao's revolution from social and individual perspectives. The course will also focus on political formation and transformation of the government, social structure and upheavals, economic reforms, and foreign policies. (cross listed with HIST 718).

IS 719. Chinese Politics. 3 Credits.

Lecture 3 hours; 3 credits. This seminar focuses on post-Mao China. It examines the fundamental rules, prominent players, and major issues in contemporary Chinese politics. The course reviews and critiques alternative theoretical approaches to the study of Chinese politics.

IS 720. Research Seminar in Global Security. 3 Credits.

Seminar 3 hours; 3 credits. The research seminar investigates the profound changes in international security brought about by the end of the Cold War with a specific focus on the role of nuclear weapons. The primary purpose of the seminar is to promote research into the global aspects of the nuclear issue and to enhance understanding of the relationship between nuclear control and the New World Order.

IS 721. New World Order: Chaos and Coherence. 3 Credits.

Seminar 3 hours; 3 credits. The end of the Cold War has ushered tremendous political changes and an equally broad intellectual debate on the meaning of these changes. What will be the basic rules of international politics? Will the future resemble the past or follow new rules of its own? What countries, what groups, and what issues will dominate the future of world politics?.

IS 722. Democracy and International Relations. 3 Credits.

Lecture 3 hours; 3 credits. An examination of the relationship between democratic politics, democratic ideals, and international relations. Subjects covered will include trends and processes of democratization and their implications for international relations, the distinctiveness of democratic states in their international behavior, the impact of the international environment on the internal politics of democratic states, and the problems of democracy in global governance.

IS 725. Politics of the Middle East. 3 Credits.

Lecture 3 hours; 3 credits. Explores the international relations of the Middle East from World War I to the present. Examines the origins of the Arab-Israeli and Persian Gulf Wars and their modern dimensions. Examines the role of oil, outside powers and religion.

IS 730. The Rise and Fall of the Socialist Bloc. 3 Credits.

Lecture 3 hours; 3 credits. This reading seminar will feature occasional lectures and extensive discussion about topics such as the consolidation of Soviet power in East Europe, the road to the Cold War, socialist economic practices, Soviet 'imperialism' within the bloc, Soviet support for 'national-liberation' movements in Asia and Africa, the building of the wall, the Sino-Soviet alliance, the events of 1989, and post-socialist nostalgia.

IS 732. National Identity in a Global Age. 3 Credits.

Lecture, 3 hours; 3 credits. This course will focus on narratives of national identity in the age of globalization. Seminal works of cultural criticism, philosophy, and political philosophy will shed light on the complex nature of national identity construction in the contemporary world.

IS 740. Political Economy of Development. 3 Credits.

This seminar examines alternate theoretical perspectives on development. These perspectives are then employed to understand contemporary political and economic changes in the developing world, including the consolidation of democratic governance and the liberalization of domestic economics.

IS 741. Globalization and Social Change in the World System. 3 Credits.

Seminar 3 hours; 3 credits. This course is intended to first identify the distinguishing characteristics of globalization. It then attempts to examine its implications on a number of critical issues, including the future of democracy, income distribution and ethnic, class, and gender relations.

IS 742. Contested Territories. 3 Credits.

Lecture 3 hours; 3 credits. Using case studies of Europe since 1918, this course examines the contours of territorial disputes. The ways in which territorial contests are presented and represented through the lenses of geopolitics, ethnicity and race, nationalism, gender, violence, international authority and diplomatic and institutional influence will be explored.

IS 745. Social Movements and Revolution in Latin American History. 3 Credits.

Lecture 3 hours; 3 credits. Interpretations of the three major social revolutions in modern Latin America (Mexico 1910, Cuba 1959 and Nicaragua 1979) and of a variety of social movements (agrarian, labor, urban, religious and so on) are studied from a continental perspective. The relevant theoretical literature and the economic, cultural and political background receive special attention. A broad knowledge of modern Latin American history is assumed.

IS 748. Gender and Globalization. 3 Credits.

Lecture, 3 hours. 3 credits. Studies systems of global restructuring as they impact women throughout the globe. Migration, international development, and transnational activism will be focal themes, explored across a variety of national contexts.

IS 751. Ethnic Conflict in the Emerging Global Order. 3 Credits.

Lecture 3 hours; 3 credits. Using different case studies, this course investigates the most important internal and external factors that cause ethnic conflicts. It also examines different mechanisms that help resolve or mitigate such conflicts.

IS 752. Research Seminar in International Studies: Refugees. 3 Credits.

Seminar 3 hours; 3 credits. This is a graduate-level seminar focusing on the refugee movement from a global perspective. The goals are to provide a critical and realistic understanding of the refugee phenomenon and to explain why the refugees tend to follow some identifiable paths, and why they sometimes return and sometimes do not. Discussion will be centered on the causes and consequences of refugee flow, and the roles the more developed countries can play in helping solve the problem.

IS 755. Conflict and Violence in Modern Africa. 3 Credits.

Lecture 3 hours; 3 credits. This course will confront the theme of conflict and violence in Africa since the mid-20th century. It will explore the reasons behind the level of violent conflicts in the continent today, seek to understand their larger significance, and explore ideas for conflict resolution and prevention. (cross listed with HIST 755).

IS 760. International Cultural Studies: History, Theory and Application. 3 Credits.

3 Cr. Course analyzes culture in the context of material conditions in which it is produced, disseminated, controlled and practiced. Theoretical application of cultural studies will include developing familiarity with key foundational theories, terminologies, and critical thinking.

IS 762. Game Theory. 3 Credits.

Lecture 3 hours, 3 credits. Game theory uses mathematical models, empirical investigation, and simulations in an effort to explain simple and complex strategic interactions among individuals, states, groups, and species. This course teaches the tools of game theory, with a focus on applications in international relations and political science.

IS 765. Agent-Based Modeling and Simulation for International Studies. 3 Credits.

Lecture 3 hours, 3 credits. An introduction to complex systems theory and to the application of agent-based modeling technologies to a variety of social systems.

IS 770. Transnational Media Practices. 3 Credits.

Lecture, 3 hours. 3 credits. Course examines the key roles played by media technologies in implementing and promoting international development programs, as well as some of the concerns these initiatives have raised in terms of media literacy, cultural sovereignty, and information access.

IS 794. Seminar in Thesis and Dissertation Preparation. 3 Credits.

3 credits. Prerequisite: permission of the director. Prepares students to research, formulate and write thesis and dissertation prospectuses.

IS 795. Topics in International Studies. 1-3 Credits.

1-3 credits. The advanced study and discussion of selected (titled) topics not offered on a regular basis.

IS 796. Selected Topics in International Studies. 1-3 Credits.

1-3 credits. The advanced study of selected topics in an interdisciplinary manner which will permit small groups of qualified students to work on subjects of mutual interest. Due to their specialized nature, the course may not be offered regularly.

IS 801. Global Change and American Foreign Policy. 3 Credits.

Seminar, 3 hours. 3 credits. This research seminar examines the transformation of the U.S. role in the world in the global context of the 20th Century and since September 2001.

IS 802. Approaches to Collective Security. 3 Credits.

Lecture 3 hours; 3 credits. This seminar explores the origins of the idea of collective security, examines the attempts to organize international security collectively and assesses possibilities and opportunities for collective security arrangements after the Cold War.

IS 803. Ethics and International Relations. 3 Credits.

Lecture 3 hours; 3 credits. The focus of this research seminar will be on the role of normative ideas in international relations. Students will be introduced to the growing literature on normative approaches to international relations as well as the traditional literature on the practical and philosophical problems of ethical action in the relations of states. Although a number of policy applications will be considered, the primary focus will be on the theoretical incorporation of normative ideas into our understanding of state action in the anarchic international environment.

IS 804. Latin American Politics. 3 Credits.

Seminar 3 hours; 3 credits. This course examines Latin American politics from comparative and historical perspectives. Particular focus is placed on various manifestations of political authority in the region and the major societal challenges to state power. The course reviews and critiques alternative theoretical approaches to the study of state-societal relations in Latin America.

IS 805. The Euro-Atlantic Community. 3 Credits.

Seminar 3 hours; 3 credits. An examination of the Euro-Atlantic area as a partial international system since World War II; alignments and patterns within and between the members of the European "community" and the role and attitudes of the United States and leading European states to preserve and strengthen their sovereign prerogatives and influence; and the prospects for a true Euro-Atlantic community that would link the U.S. and Europe.

IS 806. The Causes of War. 3 Credits.

Lecture 3 hours; 3 credits. This research seminar will explore the theoretical and empirical literature on the causes of violent conflict between states.

IS 807. Interdependence, Power, and Transnationalism. 3 Credits.

Seminar 3 hours; 3 credits. This course covers the fundamental concepts, ideas, and approaches to the study of interdependence and transnationalism. It seeks to expose students to the nature, role, and impact of economic, technological, strategic, and cultural interdependence. Cases of interdependence and transnationalism are explored in the post-Cold War era. Some focus is placed on how interdependence and transnationalism are impacting the power of the state.

IS 809. Chinese Foreign Policy. 3 Credits.

Seminar 3 hours; 3 credits. This seminar includes an advanced survey of theoretical approaches to the study of Chinese foreign policy and in-depth analyses of the domestic/international environment, ideological principles, political/economic goals, military/diplomatic instruments, decision-making processes, and global/regional consequences of Chinese foreign policy.

IS 810. Global Environmental Policy. 3 Credits.

Lecture 3 hours; 3 credits. This seminar examines the institutions and political actors involved in global environmental policy making with emphasis on the role of the United States. In doing so, it addresses the scientific and political debate concerning the causes, consequences, and proposed solutions of selected worldwide ecological problems, including global climate change, stratospheric ozone depletion, acid rain, and loss of biodiversity among others.

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Seminar 3 hours; 3 credits. A review of current literature and empirical issues concerning transnational migration and refugees.

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Seminar 3 hours; 3 credits. The unification of Germany and the end of the East-West conflict have changed the context within which policy is made in Europe. What kind of Europe will emerge? What kind of hierarchies will determine direction and pace of European politics? The purpose of this course is to explore the role played by Germany in the development of post-Cold War European politics.

IS 813. Global Political Economy. 3 Credits.

Seminar 3 hours; 3 credits. Analysis of the forces shaping national and transnational economic institutions and their policies on a range of contemporary issues, including North-South relations.

IS 814. Law in the International System. 3 Credits.

Lecture 3 hours; 3 credits. An introduction to the principles of international law and to the political and institutional role of law in the relations of states.

IS 815. France and New Europe. 3 Credits.

Seminar 3 hours; 3 credits. Emphasis will be placed on the transformation of French-American relations from the idyllic beginnings of the American nation to the complexities of the Cold War, to the new alignments of the new Europe and the European Union.

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IS 819. Chinese Politics. 3 Credits.

Lecture 3 hours; 3 credits. This seminar focuses on post-Mao China. It examines the fundamental rules, prominent players, and major issues in contemporary Chinese politics. The course reviews and critiques alternative theoretical approaches to the study of Chinese politics.

IS 820. Research Seminar in Global Security. 3 Credits.

Seminar 3 hours; 3 credits. The research seminar investigates the profound changes in international security brought about by the end of the Cold War with a specific focus on the role of nuclear weapons. The primary purpose of the seminar is to promote research into the global aspects of the nuclear issue and to enhance understanding of the relationship between nuclear control and the New World Order.

IS 821. New World Order: Chaos and Coherence. 3 Credits.

Seminar 3 hours; 3 credits. The end of the Cold War has ushered tremendous political changes and an equally broad intellectual debate on the meaning of these changes. What will be the basic rules of international politics? Will the future resemble the past or follow new rules of its own? What countries, what groups, and what issues will dominate the future of world politics?.

IS 822. Democracy and International Relations. 3 Credits.

Lecture 3 hours; 3 credits. An examination of the relationship between democratic politics, democratic ideals, and international relations. Subjects covered will include trends and processes of democratization and their implications for international relations, the distinctiveness of democratic states in their international behavior, the impact of the international environment on the internal politics of democratic states, and the problems of democracy in global governance.

IS 825. Politics of the Middle East. 3 Credits.

Lecture 3 hours; 3 credits. Explores the international relations of the Middle East from World War I to the present. Examines the origins of the Arab-Israeli and Persian Gulf Wars and their modern dimensions. Examines the role of oil, outside powers and religion.

IS 830. The Rise and Fall of the Socialist Bloc. 3 Credits.

Lecture 3 hours; 3 credits. This reading seminar will feature occasional lectures and extensive discussion about topics such as the consolidation of Soviet power in East Europe, the road to the Cold War, socialist economic practices, Soviet 'imperialism' within the bloc, Soviet support for 'national-liberation' movements in Asia and Africa, the building of the wall, the Sino-Soviet alliance, the events of 1989, and post-socialist nostalgia.

IS 832. National Identity in a Global Age. 3 Credits.

Lecture, 3 hours; 3 credits. This course will focus on narratives of national identity in the age of globalization. Seminal works of cultural criticism, philosophy, and political philosophy will shed light on the complex nature of national identity construction in the contemporary world.

IS 840. Political Economy of Development. 3 Credits.

This seminar examines alternate theoretical perspectives on development. These perspectives are then employed to understand contemporary political and economic changes in the developing world, including the consolidation of democratic governance and the liberalization of domestic economics.

IS 841. Globalization and Social Change in the World System. 3 Credits.

Seminar 3 hours; 3 credits. This course is intended to first identify the distinguishing characteristics of globalization. It then attempts to examine its implications on a number of critical issues, including the future of democracy, income distribution and ethnic, class, and gender relations.

IS 842. Contested Territories. 3 Credits.

Lecture 3 hours; 3 credits. Using case studies of Europe since 1918, this course examines the contours of territorial disputes. The ways in which territorial contests are presented and represented through the lenses of geopolitics, ethnicity and race, nationalism, gender, violence, international authority and diplomatic and institutional influence will be explored.

IS 845. Social Movements and Revolution in Latin American History. 3 Credits.

Lecture 3 hours; 3 credits. Interpretations of the three major social revolutions in modern Latin America (Mexico 1910, Cuba 1959 and Nicaragua 1979) and of a variety of social movements (agrarian, labor, urban, religious and so on) are studied from a continental perspective. The relevant theoretical literature and the economic, cultural and political background receive special attention. A broad knowledge of modern Latin American history is assumed.

IS 848. Gender and Globalization. 3 Credits.

Lecture, 3 hours. 3 credits. Studies systems of global restructuring as they impact women throughout the globe. Migration, international development, and transnational activism will be focal themes, explored across a variety of national contexts.

IS 851. Ethnic Conflict in the Emerging Global Order. 3 Credits.

Lecture 3 hours; 3 credits. Using different case studies, this course investigates the most important internal and external factors that cause ethnic conflicts. It also examines different mechanisms that help resolve or mitigate such conflicts.

IS 852. Research Seminar in International Studies: Refugees. 3 Credits.

Seminar 3 hours; 3 credits. This is a graduate-level seminar focusing on the refugee movement from a global perspective. The goals are to provide a critical and realistic understanding of the refugee phenomenon and to explain why the refugees tend to follow some identifiable paths, and why they sometimes return and sometimes do not. Discussion will be centered on the causes and consequences of refugee flow, and the roles the more developed countries can play in helping solve the problem.

IS 855. Conflict and Violence in Modern Africa. 3 Credits.

Lecture 3 hours; 3 credits. This course will confront the theme of conflict and violence in Africa since the mid-20th century. It will explore the reasons behind the level of violent conflicts in the continent today, seek to understand their larger significance, and explore ideas for conflict resolution and prevention. (cross listed with HIST 755).

IS 860. International Cultural Studies: History, Theory and Application. 3 Credits.

3 Cr. Course analyzes culture in the context of material conditions in which it is produced, disseminated, controlled and practiced. Theoretical application of cultural studies will include developing familiarity with key foundational theories, terminologies, and critical thinking.

IS 862. Game Theory. 3 Credits.

Lecture 3 hours, 3 credits. Game theory uses mathematical models, empirical investigation, and simulations in an effort to explain simple and complex strategic interactions among individuals, states, groups, and species. This course teaches the tools of game theory, with a focus on applications in international relations and political science.

IS 865. Agent-Based Modeling and Simulation for International Studies. 3 Credits.

Lecture 3 hours, 3 credits. An introduction to complex systems theory and to the application of agent-based modeling technologies to a variety of social systems.

IS 868. Internship in International Studies. 1-6 Credits.

1-6 credits. Prerequisite: approval of director. Internship individually arranged at local, state, or international level.

IS 870. Transnational Media Practices. 3 Credits.

Lecture, 3 hours. 3 credits. Course examines the key roles played by media technologies in implementing and promoting international development programs, as well as some of the concerns these initiatives have raised in terms of media literacy, cultural sovereignty, and information access.

IS 894. Seminar in Thesis and Dissertation Preparation. 3 Credits.

3 credits. Prerequisite: permission of the director. Prepares students to research, formulate and write thesis and dissertation prospectuses.

IS 895. Topics in International Studies. 1-3 Credits.

1-3 credits. The advanced study and discussion of selected (titled) topics not offered on a regular basis.

IS 896. Selected Topics in International Studies. 1-3 Credits.

1-3 credits. The advanced study of selected topics in an interdisciplinary manner which will permit small groups of qualified students to work on subjects of mutual interest. Due to their specialized nature, the course may not be offered regularly.

IS 897. Independent Research in International Studies. 3 Credits.

1-9 credits. Prerequisite: approval of the director. Independent research directed by professors.

IS 898. Directed Research. 1-9 Credits.

1-9 credits. Prerequisite: approval of director or instructor. Methodological and theoretical preparation designed to assist students in writing a dissertation.

IS 899. Dissertation. 1-9 Credits.

1-9 credits. May be repeated up to 18 credits.

IS 998. IS 998. 1 Credit.

IS 999. International Studies 999. 1 Credit.

1 credit. A one-hour pass/fail registration required of all graduate students to maintain active status during the final semester prior to graduation. After successfully passing the candidacy examination, all doctoral students are required to be registered for at least one graduate credit each term until the degree is complete.

IT - Information Technology

INFORMATION TECHNOLOGY Courses

IT 530. Object-Oriented Programming with JAVA. 3 Credits.

Lecture and discussion 3 hours; 3 credits. An introduction to JAVA as an object-oriented language used to write JAVA applets and applications. Business examples incorporating multimedia, multithreading, networking, and advanced graphical interfaces are used to reinforce the object-oriented concepts of abstraction, encapsulation, inheritance, polymorphism, persistence, and dynamic binding.

IT 595. Topics. 1-3 Credits.

IT 610. Information Technology Management. 3 Credits.

Lecture 3 hours; 3 credits. Information is a critical resource for today's organizations. This course prepares students for the managerial, organizational and technological challenges involved on managing information and information technology resources.

IT 612. Knowledge Management. 3 Credits.

Lecture and discussion 3 hours; 3 credits. Prerequisites: IT 610 or equivalent; This course covers theory and practice of managing knowledge in organizations. Knowledge processes including knowledge creation, acquisition, transfer and application are studied. Students are introduced to real-world technologies and systems.

IT 614. Information and Knowledge Management. 2 Credits.

Information and knowledge are critical resources for today's organizations. This course prepares students for the managerial, organizational, and technological challenges involved in managing information and knowledge. Prerequisites: Admission to the MBA Program, MBA 600, MBA 601, MBA 602, MBA 603, and MBA 604.

IT 620. Systems Analysis and Design. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: IT 610 or equivalent; or permission of the department. Introduction to the Systems Development Life Cycle (SDLC) from an information systems project perspective. Emphasis is placed on the planning and analysis functions performed during information systems project work. Tools and techniques include: Data flow diagrams, Entity relationship diagrams, Computer-aided systems engineering (CASE), and the Project repository. These tools will be employed to create process and data-driven versions of these models.

IT 624. Information Technology Assurance Services. 3 Credits.

Lecture and discussion 3 hours; 3 credits. Prerequisite: ACCT 601 or equivalent. Standards, ethics, and practice of information technology assurance services particularly as it concerns the governance and control of information systems. (cross listed with ACCT 624).

IT 625. Information Systems for International Business. 3 Credits.

Lecture and discussion 3 hours; 3 credits. Prerequisite: IT 610 or equivalent; or permission of the department. Examines the role of information in the global environment and the global organization. Issues related to information infrastructures for the organization, nation and the world will be covered, as well as how global information systems departments support the organization.

IT 635. Telecommunication and E-Commerce. 3 Credits.

Lecture and discussion 3 hours; 3 credits. Prerequisite: IT 620 or equivalent; or permission of the department. Examines the impact of electronic commerce and telecommunications in the global business environment. A comprehensive introduction to the use of the Internet to effectively exploit the Internet's resources for business applications.

IT 649. Information Systems and Network Security. 3 Credits.

Lecture and discussion 3 hours; 3 credits. Prerequisite: IT 635 or permission of the department. Introduces the fundamental issues and concepts of information security, emphasizing security policy, risk management, cryptography and network security.

IT 650. Database Management Systems. 3 Credits.

Lecture and discussion 3 hours; 3 credits. Prerequisite: IT 620 or equivalent; or permission of the department. Introduction to database management systems. The topics addressed include system architecture, data models, database analysis, design and implementation, query processing, business transaction processing, and database security.

IT 651. Data Warehousing and Mining. 3 Credits.

Lecture and discussion 3 hours; 3 credits. Prerequisite: IT 650 or permission of the department. Introduction to data warehousing and mining. Examines techniques used to extract data patterns and relationships from various operational and historical data.

IT 652. On-Line Analytical Processing (OLAP). 3 Credits.

Lecture and discussion 3 hours; 3 credits. Prerequisite: IT 650 or permission of the department. Introduction to On-Line Analytical Processing and the use of multidimensional techniques and tools to extract information from data warehouses and marts.

IT 653. Database Administration Fundamentals. 3 Credits.

Lecture, 3 hours. 3 credits. Prerequisite: IT 650. Overview of database administration of major database platforms such as Oracle and DB2. Topics include database installation and configuration, performance monitoring and tuning, storage management, database security, user management, database connectivity, and backup/recovery techniques.

IT 654. Advanced Database Administration. 3 Credits.

Lecture, 3 hours. 3 credits. Prerequisite: IT 650. Overview of advanced database administration techniques of state-of-the-art database platforms. Topics include grid infrastructure, database clouds, RAC.

IT 655. Database Programming for the Web. 3 Credits.

Lecture, 3 hours. 3 credits. Prerequisite: IT 650. In-depth exploration of web-based database administration and implementation. Hands-on experience with a variety of web-based database technologies. Topics include: MySQL, PHP, XML database technologies such as XQuery, XPath, and XML schemas, web log analysis, and text mining.

IT 660. Enterprise Information Systems. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: IT 650. This course covers the organizational design and implementation of enterprise information systems based on large ERP software packages. Software engineering issues specific to packaged software such as software customization, upgrade, localization, extension and integration are explored. Students are exposed to real-world technologies and systems.

IT 661. Implementing Internet Applications. 3 Credits.

Lecture and discussion 3 hours; 3 credits. Prerequisites: IT 610 or equivalent; prior programming experience; or permission of the department. Advanced design and implementation strategies are utilized to create dynamic e-commerce applications. Key concepts include: Internet architecture, structured data languages, scripting languages, programming languages, database connectivity, and Internet security.

IT 664. Project Management in Information Technology. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: IT 620 or equivalent, or permission of the department. This course provides basic knowledge of project management including tools to manage scope, time, cost, quality, risk, team, communications and procurement. Special issues in the IT context are emphasized.

IT 665. Network Systems Administration. 3 Credits.

Lecture and discussion 3 hours; 3 credits. Prerequisite: IT 635 or permission of the department. Covers the essential knowledge and skills required to administer networks. Hands-on experience with commercial software. Topics include architecture, planning, installation, configuration, resource sharing, and network optimization.

IT 667. Cooperative Education. 1-3 Credits.

1-3 credits. Prerequisite: IT 620 or equivalent. Approval for enrollment and allowable credits are determined by the department and Career Management in the semester prior to enrollment.

IT 668. Information Systems Internship.. 1-3 Credits.

1-3 credits. Prerequisite: IT 620 or equivalent. Approval for enrollment and allowable credits are determined by the department and Career Management in the semester prior to enrollment. Available for pass/fail grading only.

IT 672. Information Architectures. 3 Credits.

Lecture and discussion 3 hours; 3 credits. Prerequisite: IT 650 or permission of the department. Modeling of information architectures for business. High-level modeling methodologies. Implications for database and object data management.

IT 674. Managing IT Strategically. 3 Credits.

Lecture and discussion 3 hours; 3 credits. Prerequisite: IT 620 or equivalent, or permission of the department. Focuses on improving business use of existing IT and managing for competitive advantage. Prepares IT students for executive positions in IT including CIO. Non-IT students benefit by gaining a strategic perspective on an important organizational resource – information.

IT 680. Computing Aspects of Medical Informatics. 3 Credits.

Lecture, 3 hours; 3 credits. Overview of computing aspects of medical informatics. Computational methods in scientific computing of medical informatics are covered. The basic thrust is to demonstrate the usefulness and power of computational methods in solving real-life problems in perspectives of medical informatics.

IT 685. Introduction to Information Security. 3 Credits.

Lecture, 3 hours. 3 credits. Prerequisite: IT 610. Introduction to technical and administrative aspects of information security. Topics include identification and authentication, access control, security models, computer intrusion detection, trust management, cryptography, PKI, fire walls, network security, web security, and secure e-commerce and e-business.

IT 695. Selected Topics in Information. 1-3 Credits.

3 credits. Prerequisite: permission of the department chair and the graduate program director.

IT 697. Independent Study in Information Systems. 1-3 Credits.

1-3 credits. Prerequisite: IT 650 or permission of the department. Affords students the opportunity to undertake independent study under the direction of a faculty member.

IT 698. Master's Project in Information. 3 Credits.

3 credits. Prerequisites: IT 650 and permission of the department.

IT 699. Master's Thesis in Information Systems. 1-6 Credits.

1-6 credits. Prerequisites: IT 650 and permission of the department.

IT 795. Selected Topics in Management Information Systems. 1-3 Credits.

3 credits. Prerequisite: permission of the department chair and the graduate program director.

IT 800. Theoretical Foundations in ISR. 3 Credits.

Lecture 3 hours; 3 credits. A survey of research methodology in business information technology research including empirical, behavioral and computational approaches in different types of problem domains. The approach will be interdisciplinary.

IT 850. Enterprise Architecture. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: IT 800. This course examines the latest advances in enterprise architecture and computing. Topics include enterprise architecture design and modeling, service-oriented architecture (SOA), and integration of enterprise information and applications.

IT 890. Seminar in Business Process and Enterprise Systems. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: IT 800. This course discusses how firms achieve business excellence through business process management (BPM), business process improvement (BPI), and business process reengineering (BPR) supported by IT. Topics include business process and workflow modeling, analysis, integration, monitoring and management.

IT 891. Seminar in Business Intelligence. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisites: IT 800. The objective of this course is to provide an overview of managerial and technical issues associated with business intelligence. Topics covered include the state-of-the art data warehousing, data mining and OLAP technologies.

IT 892. Seminar in Knowledge Management. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisites: IT 800. The course examines the latest advances in knowledge management (KM) including identifying, capturing, sharing and evaluating an enterprise's knowledge assets. The course reviews and discusses existing technologies in KM and new emerging KM technologies and practices.

IT 893. Seminar in Supply Chain in E-Business. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisites: IT 800. This course examines the development of information technologies related to supply chain management in a global e-business environment. Topics include managing material flow processes, maritime, logistics, procurement, inventory and distribution. (cross-listed with MSCM 893).

IT 895. Selected Topics in Management Information Systems. 1-3 Credits.

3 credits. Prerequisite: permission of the department chair and the graduate program director.

IT 899. Dissertation. 1-12 Credits.

3 hours; 1-12 credits. Departmental approval required. Prerequisite: IT 893. PhD level research and writing of dissertation.

IT 998. IT 998. 1 Credit.

LIBS - Library Science

LIBRARY SCIENCE Courses

LIBS 602. Production of Instructional Materials. 3 Credits.

Develops skills in preparing, evaluating, and presenting instructional materials and the use of those materials to promote higher level thinking and to enhance the teaching learning environment. Includes logistics and safety concerns of a production facility, and development of in-service activities.

Hands-on practice in producing television programs and using compute software to produce instructional materials.

LIBS 605. Selection and Utilization of Non-Book Media. 3 Credits.

Prerequisites: LIBS 675. Emphasizes selection, purchase and utilization of non-book materials (e.g., periodicals, computers, CD-ROM, DVD, LANs, wireless networks, PDAs, e-books, retrieval systems, video conferencing, DL, online services, telecommunications, presentation systems). Included are staff development, systems management, information policies, networks, and the impact of professional associations on non-book resources.

LIBS 642. Children's Literature Across the Curriculum, PK-8. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: graduate standing. Students examine, evaluate, discuss, and use literature and related nonprint materials for children and young adolescents and explore strategies for using trade books across the curriculum and for introducing children to literature. Materials for adolescents and adults with limited reading abilities are also covered.

LIBS 669. Practicum in School Libraries. 3-9 Credits.

Course can be repeated 1 time. Students will work in a school library, participating fully in the administrative tasks, collaborate with teachers to prepare instructional literacy lessons, and teach lessons. Course is for students who are already licensed teachers or who are seeking initial licensure. Prerequisites: LIBS 602, LIBS 605, LIBS 675, LIBS 676, LIBS 678, and LIBS 679.

LIBS 675. Administration, Management, and Evaluation of Libraries. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: graduate standing. Entry-level course dealing with the planning, organization, and management of the school library media center. Includes professionalism and ethics in librarianship, facilities planning to impact student learning, and management of human resources.

LIBS 676. Library Media Services and the Curriculum. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisites: graduate standing and LIBS 675. Emphasis is on library services/ programs and the curriculum of the school. Includes techniques for curriculum design and development, information skills instruction, instructional partnerships, advocacy, implementation of an integrated library-media instructional program and public relations programs.

LIBS 677. Technical Services in Libraries. 3 Credits.

Describes the fundamentals of description, cataloging, processing, organizing, and accessing of materials. This includes on-line circulation systems, descriptive cataloging using AACR2R and MARC, Dewey Decimal Classification, and Sears Subject Headings. Also discusses bibliographic networks and utilities in technical services and the relationship of technical services procedures to the overall mission of the SLMC. Prerequisites: graduate standing.

LIBS 678. Selection, Evaluation and Utilization of Materials NK-12. 4 Credits.

Lecture 4 hours; 4 credits. Prerequisites: graduate standing, LIBS 642, 675. Emphasis is on reading and evaluating current materials for children and young adults, researching reading/viewing/ listening preferences, analyzing studies dealing with literature/media, and selecting materials. Also includes collection analysis and development.

LIBS 679. Theory and Management of Reference and Information Retrieval. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisites: graduate standing and LIBS 675. Students evaluate, select, and use reference sources; explore strategies for teaching reference skills across the curriculum; use curriculum information to evaluate reference collections and prepare bibliographies; and explore issues related to reference services. Utilizes print as well as existing and emerging technologies.

LIBS 998. LIBS 998. 1 Credit.

MAE - Mechanical and Aerospace Engineering

MECHANICAL AND AEROSPACE ENGINEERING Courses

MAE 503. Flight Mechanics. 3 Credits.

Aircraft concepts including performance prediction and optimization, flight and maneuver envelopes, and steady flight performance. Additional topics: longitudinal static stability and trim; aircraft dynamics; development, separation and solution of aircraft equations of motion; natural modes; dynamic stability; sensors and actuators; and design of stability augmentation and autopilot systems. Prerequisites: MAE 406, MAE 436.

MAE 504. Vibrations. 3 Credits.

Free and forced vibrations of undamped and damped, single-degree of freedom, multi-degree of freedom, and continuous systems. Exact and approximate methods to find natural frequencies. Prerequisites: A grade of C or better in MAE 205, a grade of C or better in MAE 220; MAE 340 and MATH 312.

MAE 506. Flight Vehicle Aerodynamics. 3 Credits.

Inviscid flow concepts including: Euler equations, stream function, velocity potential, singularities, vorticity and circulation laws. Viscous flow topics including boundary layers separation, and turbulent flow. In addition, external flows, lift and drag, thin airfoil theory, finite wing theory and airfoil design will be discussed. Prerequisites: A grade of C or better in MAE 303; MAE 312 and MAE 340.

MAE 507. Ground Vehicle Aerodynamics. 3 Credits.

Review of basic fluid mechanics of the incompressible flow of air. Introduction to bluff body aerodynamics, production and performance (race car) automotive aerodynamics, as well as truck and bus aerodynamics. Discussion of experimental and computational methods for evaluating vehicle aerodynamic performance. Optimization of high performance vehicle design for low drag and/or high downforce and the facilities and techniques required. Introduction to the aerodynamics of other surface vehicles such as sailboats and trains. Lecture and wind tunnel experiments. Prerequisites: A grade of C or better in MAE 303 or MET 330 or CEE 330.

MAE 511. Mechanical Engineering Power Systems Theory and Design. 3 Credits.

Thermodynamic properties of gases and vapors relating to power generating devices, work-energy relations, combustion, and heat exchangers. Performance analyses and design concepts of gas turbines, internal combustion engines, steam power plants and heat exchanger equipment from theoretical and applied viewpoints. Prerequisites: MAE 312 and MAE 315.

MAE 512. Environmental Control. 3 Credits.

Engineering principles as applied to the analysis and design of systems for automatically controlling man or machine environments. Course encompasses fundamentals of heating, ventilating, air conditioning, refrigeration, cryogenics, and design of building energy systems. Prerequisites: MAE 312 and MAE 315.

MAE 513. Energy Conversion. 3 Credits.

Introduction of relevant kinetic theory, solid state, and thermodynamic principles; operation and analysis of thermoelectric, photovoltaic, thermionic, magnetohydrodynamic devices, fuel cell, isotopic, and solar power generators. Course seeks to define engineering limits of converter efficiency and other performance criteria. Prerequisites: MAE 312.

MAE 514. Introduction to Gas Dynamics. 3 Credits.

One-dimensional compressible flow considering isentropic flow, normal shocks, flow in constant area ducts with friction, flow in ducts with heating and cooling, oblique shocks, Prandtl-Meyer expansions, shock-expansion theory, flow around diamond shaped airfoils, and wind tunnel mechanics. Prerequisites: A grade of C or better in MAE 303 and a grade of C or better in MAE 311.

MAE 516. Introduction to Solar Energy Engineering. 3 Credits.

Prerequisites: MAE 315. Basic solar radiation processes, engineering analysis of solar collectors, energy storage methods, system design and simulation, applications to heating, cooling, and power generation.

MAE 517. Propulsion Systems. 3 Credits.

Basic principles of design, operation and performance of propulsion systems - including turbojet, turboprop, turbofan, and ramjet engines. Introduction to chemical rockets, ion and plasma thrusters. Prerequisite: MAE 312 or MAE 414.

MAE 520. Aerospace Structures. 3 Credits.

Analysis of aircraft and space vehicle structural components. Effects of bending, torsion and shear on typical aerospace structural components, statically indeterminate beams, shear center and shear flow. Introduction to typical aerospace structures. Introduction to composite structures. Prerequisites: MAE 332.

MAE 522. Modern Engineering Materials. 3 Credits.

Limitations of conventional materials; inter-relationship among materials, design and processing, material selection criteria and procedures; strengthening mechanisms in metals; superelasticity; shape memory effect, amorphous metals; structure-property relationship in polymers; polymers crystallinity; thermoplastic and thermosets; high-temperature restraint polymers; ceramics; toughening mechanisms in ceramics. Prerequisites: MAE 201, MAE 203, and a grade of C or better in MAE 220; MAE 332.

MAE 531. Mechanisms Analysis and Design. 3 Credits.

Basic relations necessary for analysis of plane motion mechanisms, numerical and analytical solutions for some of the basic mechanisms, methods of calculating rolling and sliding velocities and accelerations of contacting bodies, cams, and gears. Prerequisites: A grade of C or better in MAE 205; MAE 332 and MATH 312.

MAE 538. Applied Analog and Digital Control. 3 Credits.

Computer-aided analysis and design of practical control systems. Introduction to state-space, digital signal processing and digital control. Laboratory sessions on aliasing, analog, system identification, and real-time control. Prerequisites: MAE 436.

MAE 540. Introduction to Finite Element Analysis. 3 Credits.

Basic concepts of finite-element method, method of weighted residuals, interpolation functions, numerical implementation of finite-element method, applications to engineering problems such as beam deflection, heat conduction, and plane elastic problems. Prerequisites: MAE 340.

MAE 550. Principles of Naval Architecture. 3 Credits.

Basic principles of naval architecture related to ship geometry, stability, strength, resistance, propulsion, vibration and motions in waves and controllability. Prerequisites: MATH 212.

MAE 557. Motorsports Vehicle Dynamics. 3 Credits.

Basic mechanics governing vehicle dynamic performance. Analytical methods in vehicle dynamics. Laboratory consists of various vehicle dynamics tests on model vehicles and full-size racecars. Prerequisites: A grade of C or better in MAE 205; MATH 307.

MAE 560. Introduction to Space Systems Engineering. 3 Credits.

Introduction to spacecraft systems starting from mission design and space environment considerations and proceeding through propulsion, altitude control, spacecraft structural design, thermal control, power and communications for spacecraft. Prerequisites: MATH 307 and PHYS 232N.

MAE 567. Racecar Performance. 3 Credits.

On-track performance of typical racecars (Legends and Baby Grand) to demonstrate and evaluate the interplay between vehicle aerodynamics, suspension system geometry adjustments, tire selection and operating pressure on overall racecar performance and handling. Laboratory testing via on-board instrumentation during skid pad and road course evaluation; computer simulation to investigate various car set-ups. Prerequisites: MAE 407 or MAE 507 and MAE 457 or MAE 557.

MAE 577. High Performance Piston Engines. 3 Credits.

A study of the fundamental principles and performance characteristics of spark ignition and diesel internal combustion engines. Overview of engine types and their operation, engine design and operating parameters; ideal and semi-empirical models of engine cycles; combustion, fluid flow and thermal considerations in engine design and performance. Laboratory evaluation of engine performance using flow and dynamometer systems. Prerequisite: MAE 312, MAE 315 or MET 300, MET 350.

MAE 595. Topics in Mechanical and Aerospace Engineering. 1-3 Credits.

Special topics of interest with emphasis placed on recent developments in mechanical and aerospace engineering or engineering mechanics. (offered fall, spring, summer) Prerequisites: Senior standing; Permission of the chair is required.

MAE 597. Independent Study in Mechanical and Aerospace Engineering. 1-3 Credits.

Individual analytical, computational, and/or experimental study in an area selected by student. Supervised and approved by the advisor. Prerequisites: Senior standing; permission of the chair is required.

MAE 601. Engineering Mathematics. 3 Credits.

Applications of linear algebra, ordinary and partial differential equations, and complex variables to engineering problems.

MAE 602. Fluid Dynamics and Aerodynamics. 3 Credits.

Prerequisites: MAE 601 or MATH 691. Conservation laws for viscous and inviscid flows. Boundary conditions; analytical and numerical solution of viscous flow problems; boundary-layer theory; 2 and 3-dimensional potential flows; applications to airfoils, wings, and internal flows; introduction to turbulence.

MAE 603. Advanced Mechanics of Solids. 3 Credits.

Stress, strain, equilibrium for deformable solids; material behavior of elasticity, hyperelasticity, plasticity and viscoelasticity; failure criteria, fracture; thermal effect; energy methods and their applications to bars and beams for static, stability and dynamic problems.

MAE 604. Analytical Dynamics. 3 Credits.

Advanced kinematics with moving reference frames. Euler equations of motion. Gyroscopic theory. Principle of virtual work, D'Alembert's principle, Hamilton's principle, Lagrange's equations of motion and rigid body dynamics.

MAE 605. Advanced Classical Thermodynamics. 3 Credits.

Prerequisites: MAE 601 or MATH 691. Rigorous development of the macroscopic theory of thermodynamics; structural basis for equations of state and general properties of matter; phase and chemical equilibria.

MAE 606. Real-Time Signals and Systems. 3 Credits.

Signals and transforms for real-time systems. Data acquisition theory and practice. System modeling. Applications to modal analysis, experimental aerodynamics, and real-time control.

MAE 607. Continuum Mechanics. 3 Credits.

Indexical notations and tensor calculus; strain and stress tensors, rate of deformation tensor, Eulerian and Lagrangian descriptions, conservation principles, constitutive formulations for elastic solids and viscous fluids, formulation of fluid mechanics and solid mechanics problems. Simple applications. Pre- or corequisite: MATH 691 or MAE 601.

MAE 608. Applied Mathematics for Engineers. 3 Credits.

Linear algebra. Vectors and matrices. Partial differential equations. Curve fittings. Applied probabilities. Statistics of distributions. Testing of hypotheses and decisions. Quality control.

MAE 610. Supersonic Flow. 3 Credits.

Prerequisites: MAE 514 and MAE 602. Governing equation for supersonic flow; full potential equations; small disturbance theory; hodographs, method of characteristics; introduction to three-dimensional flows; compressible boundary layer flows; internal flows in nozzles and diffusers, airfoil flows, slender bodies of revolution flows, conical flows, wing flows.

MAE 611. Computational Fluid Dynamics I. 3 Credits.

Prerequisites: MAE 601 or MATH 691. Classification of single PDE's; finite difference methods; stability analysis, convergence, consistency, efficiency; basics of finite volume methods; model equations of hyperbolic, parabolic and elliptic type; explicit and implicit schemes, central and upwind schemes, weak solutions of quasi-linear hyperbolic equations.

MAE 612. Experimental Aerodynamics. 3 Credits.

Prerequisites: MAE 602 and MAE 610. Techniques for static and dynamic measurement of pressure, temperature, and velocity. Experiment control, statistical treatment of data. Probe methods, including multi-hole pressure probes and hot-wire anemometers. Non-intrusive methods, including Laser Doppler Velocimetry and other optical methods. Surface and stream flow visualization. Surface measurements.

MAE 613. Aerospace Test Facilities. 3 Credits.

Prerequisites: Permission of the instructor. Comprehensive examination of aerodynamic test facilities for use in subsonic, transonic, supersonic and hypersonic flow regimes. Aspects of wind tunnel design and operation. Flow quality. Wall and support interferences. Advanced concepts including cryogenic wind tunnels, adaptive wall test sections and magnetic suspension. Dynamic testing. Review of flight test methods, including extraction of aerodynamic parameters from flight test data. Review of engine test facilities. Review of ground test facilities for space structures and other space systems.

MAE 620. Heat Transfer I. 3 Credits.

Aspects of conduction, convection and radiation heat transfer, including governing equations, boundary layer flows, analytical and numerical solutions to one-, two-, and three-dimensional problems. Prerequisites: MAE 602.

MAE 622. Theory and Design of Turbomachines. 3 Credits.

Prerequisites: MAE 514 and MAE 602. Real cycles; fluid motion in turbomachines; theory of diffusers and nozzles; fluid-rotor energy transfer; radial equilibrium; transonic stages; combustion chambers; axial and centrifugal turbines; axial and centrifugal pumps and compressors; performance and design criteria; cavitation and two-phase flow considerations.

MAE 623. Nuclear Engineering. 3 Credits.

Nuclear power plant systems; power reactor control and kinetic behavior, including safety coefficients, accumulative poisons, temperature control parameters; primary and secondary plant as a transient system.

MAE 624. Energy Utilization and Conservation. 3 Credits.

Prerequisites: Permission of instructor. Overview of scope of efficient energy utilization in industrial, commercial, transportation, and power generation fields; power plant waste-heat utilization, district heating, combined gas and steam cycle, organic fluid-bottoming cycle, total energy concept for residential and commercial buildings; system management, on-line computer evaluation, energy analysis.

MAE 630. Finite Element Analysis I. 3 Credits.

Provides an understanding of the finite element method (FEM) as derived from an integral formulation perspective. Demonstrates the solutions of (1-D and 2-D) continuum mechanics problems such as solid mechanics, fluid mechanics and heat transfer. Provides insight into the theoretical formulation and numerical implementation of finite element methods.

MAE 631. Experimental Structural Dynamics. 3 Credits.

Prerequisites: MAE 634. Experimental techniques and methods for structural dynamics and modal analysis. Instrumentation utilization including electrodynamic shakers, impact hammers, accelerometers, laser vibrometers, signal analyzers, signal filters, and force transducers. Time and frequency domain data acquisition, assessment, and post-processing. Development of mathematical models from experimental data.

MAE 633. Flight Vehicle Structural Analysis. 3 Credits.

Prerequisites: MAE 601 or MATH 691. Aircraft loads estimation. Review of basic elasticity. Stress functions, Prandtl stress function, St. Venant warping, membrane analogy. Bending, shear, and torsion of open and closed, thin-walled cross sections. Analysis of tapered beams with application to fuselages and wings, cutouts, end constraints. Introduction to composite materials.

MAE 634. Theory of Vibrations. 3 Credits.

Prerequisites: MAE 504 and MAE 601 or MATH 691. Introduction to applied modal analysis, modes of vibration of discrete systems; modal coordinates, transfer functions in frequency domain, modes of vibration of continuous systems and approximate systems response. Introduction to FE methods and nonlinear vibrations. Applications to rods, beams, plates and shells.

MAE 640. Modern Control Theory. 3 Credits.

Formulation of state space equations governing dynamics and stability of linear systems. Controllability; observability. State feedback control design. Optimal control methods. State observers and estimators.

MAE 641. Aerospace Vehicle Performance. 3 Credits.

Prerequisites: MAE 602 and MAE 514 or MAE 610. A study of the flight performance of aerospace vehicles. Review of aerodynamic and propulsion characteristics. Range, flight and maneuver envelopes for vehicles in atmospheric flight. Introduction to methods of design and trajectory optimization. Design and performance of launch vehicles. Open-ended, design-oriented project work.

MAE 642. Flight Control Actuators and Sensors. 3 Credits.

Prerequisites: MAE 503, MAE 538, and MAE 604. Overview of governing principles and operations of actuator and sensor hardware used in aircraft and spacecraft flight control systems. Hydraulic, electro-hydraulic and electric actuators. Control jets and momentum wheels. Accelerometers and rate gyros. Air-Data systems. Inertial navigation systems and satellite navigation systems. Dynamic model development, analysis and simulation. Nonlinear hardware characteristics and the influence on closed-loop vehicle behavior.

MAE 650. Composite Materials. 3 Credits.

Prerequisites: Permission of the instructor. Reinforcements, matrices, particulate-composites; short-fiber and continuous-fiber reinforced composites; prediction of elastic failure properties; directionally solidified composites; design considerations; experiments.

MAE 652. Mechanical Behavior of Materials. 3 Credits.

Prerequisites: Permission of instructor. Macroscopic behavior of materials with respect to elasticity, plasticity, and viscoelasticity; yield criteria, fracture, influence of high and low temperatures, corrosion and radiation.

MAE 654. Thermomechanical Processing of Materials. 3 Credits.

Principles of thermal and chemical refining processes; modeling melting and solidification processes; fundamentals of metal castings including flow of molten metal and heat transfer during solidification; superplastic forming of metals, strain crystallizing of polymers; effects of processing on properties.

MAE 667. Cooperative Education in Mechanical and Aerospace Engineering. 1-3 Credits.

Student participation for credit based on academic relevance of the work experience, criteria, and evaluative procedures as formally determined by the department and the Cooperative Education program prior to the semester in which the work experience is to take place. Prerequisites: Approval by Department and Career Management Center.

MAE 668. Internship in Mechanical and Aerospace Engineering. 1-3 Credits.

Academic requirements will be established by the department and will vary with the amount of credit desired. Allows students an opportunity to gain short duration career-related experience. Prerequisites: Approval by Department and Career Management Center.

MAE 669. Practicum in Mechanical and Aerospace Engineering. 1-3 Credits.

Academic requirements will be established by the department and will vary with the amount of credit desired. Allows students an opportunity to gain short duration career-related experience. Student is usually already employed--this is an additional project within the organization. Prerequisites: Approval by Department and Career Management Center.

MAE 670. Computational Methods in Mechanical and Aerospace Engineering. 3 Credits.

Numerical methods for linear algebra eigenvalue problems, curve fitting optimization, differentiation, integration, ordinary and partial differential equations. Applications in mechanical and aerospace engineering.

MAE 672. Design of Experiments. 3 Credits.

Formal experiment design. Review of statistics. ANOVA, multiple comparisons, residuals, model adequacy checking. Randomized complete block designs, factorial designs, 2^k factorial and fractional factorial designs, random and mixed effects in factorials, optimization, introduction to response surface methods. Laboratory exercises use designed experiments applied to aerospace testing, including wind tunnel testing and instrument calibration. Prerequisites: MAE 572.

MAE 680. Engineering Software for Computer-Aided Analysis and Design. 3 Credits.

Prerequisites: Permission of the instructor. Introduction to advanced CAD software for finite element modeling and analysis, multibody dynamic analysis, kinematic analysis and design optimization. MSC/NASTRAN, PATRAN, DADS, GENESIS and other commercially available software will be introduced.

MAE 681. Robots and Manufacturing Automation. 3 Credits.

Manufacturing processes. Automatic production and assembly. Numerical control. Industrial robots. Logic control systems. Logic diagramming. Programmable logic control. On-line computer control. Computer-integrated manufacturing. Case studies.

MAE 682. Concurrent Engineering. 3 Credits.

Study of principles of concurrent engineering with emphasis on the design/manufacture interface for single products; Rapid prototyping projects; Design of injection-molded and stamped parts for cost.

MAE 684. Process Modeling and Reengineering. 3 Credits.

Prerequisites: MAE 682. Study of methodologies and available tools to analyze "problem" processes and determine solutions to improve bottom-line performance. A Process Modeling project will be the key component of this course to reinforce the principles of Process Re-Engineering. Another major topic is Parametric Design by Guided Iteration.

MAE 685. Projects Design and Manufacturing. 3 Credits.

Prerequisites: Permission of the instructor. Project(s) course to allow graduate students to complete a practical engineering assignment in design and manufacturing areas.

MAE 686. Engineering Design with Uncertainties. 3 Credits.

Prerequisites: MAE 608. An introduction to managing uncertainties and risk in strength design of mechanical components. A study of theoretical background, computational implementation, and applications of reliability-based methods for engineering analysis and design.

MAE 688. Computational Intelligence for Engineering Design Optimization Problems. 3 Credits.

The concepts and algorithms of computational intelligence and their applications to engineering optimization problems will be discussed. The topics to be covered are artificial neural networks, evolutionary optimization and swarm intelligence. Both single and multi-objective optimization problems with continuous and/or discrete variables will be discussed.

MAE 690. Mechanical and Aerospace Engineering Seminar. 1 Credit.

Regular tutorials on recent topics of interest in mechanical and aerospace engineering and engineering mechanics.

MAE 695. Topics in Mechanical and Aerospace Engineering. 3 Credits.

Special topics of interest with emphasis placed on recent developments in mechanical and aerospace engineering or engineering mechanics.

MAE 696. Experimental Research Project. 3 Credits.

An independent laboratory experience in the area of either aerodynamics, structural dynamics or applied automatic control. Results will be reported in a format and quality similar to a technical conference paper.

MAE 697. Independent Study in Mechanical and Aerospace Engineering. 3 Credits.

Individual analytical, computational and/or experimental study in an area selected by the student. Supervised and approved by the advisor.

MAE 698. Master's Project in Mechanical and Aerospace Engineering. 1-3 Credits.

Individual project, investigation under the direction of the student's major professor.

MAE 699. Thesis Research in Mechanical and Aerospace Engineering. 1-6 Credits.

Thesis research in mechanical and aerospace engineering or engineering mechanics leading to the Master of Science degree. Prerequisites: instructor approval required.

MAE 710. Transonic Aerodynamics. 3 Credits.

Prerequisites: MAE 610. Singular surfaces under the Euler limit; transonic breakdown of linearized theory; transonic expansion procedures; transonic small disturbance theory; transonic slender bodies, similarity rules; hodograph equation; transonic far fields; relaxation schemes; unsteady transonic flows, three-dimensional wings; finite difference methods.

MAE 711. Hypersonic Aerodynamics. 3 Credits.

Prerequisites: MAE 610. General consideration of hypersonic flow and similarity principles, hypersonic flow past slender bodies with sharp and blunt leading edges. Hypersonic blunt-body flow. Real gas, viscous and low density effects, and consideration of nonequilibrium phenomena in hypersonic flows.

MAE 712. Unsteady Aerodynamics and Aeroelasticity. 3 Credits.

Prerequisites: MAE 602, MAE 611, and MAE 634. Oscillating airfoils in incompressible, subsonic and supersonic flows; Arbitrary airfoil motion, Oscillating finite wings; Unsteady motion of finite wings; Unsteady motion of nonlifting bodies; Aeroelastic phenomena; Static and dynamic loads, divergence, control reversal, flutter, dynamic response.

MAE 713. Turbulent Flow. 3 Credits.

Prerequisites: MAE 602 and MAE 715 or MAE 815. Isotropic and homogeneous turbulence. Mixing length theories, Equilibrium turbulence models, Two-equations models (k-epsilon). Large eddy simulation. Reynold's stress transport models. Numerical simulations. Compressible and non-equilibrium turbulence effects.

MAE 714. Aerodynamic Flow Control. 3 Credits.

Prerequisites: MAE 602 and MAE 610. Introduction and definitions, goals, passive and active control methodologies and techniques. Flow separation control, drag reduction control techniques, flow transition control. Micro-electrical-mechanical systems (MEMS) control, future challenges.

MAE 715. Boundary Layer Theory. 3 Credits.

Prerequisites: MAE 602. Boundary layer equations; method of matched asymptotic expansions; body oriented coordinates, finite-difference solutions; separations, wake and jet flows; thermal and compressible boundary layers, transformations and finite-difference solutions, unsteady boundary layers. Introduction to hydrodynamic stability and turbulence.

MAE 716. Computational and Fluid Dynamics II. 3 Credits.

Prerequisites: MAE 611. Classification of systems of PDE's; mathematical nature of Euler equations; conservative form of the Navier-Stokes equations; grid generation; central difference schemes; finite volume schemes; upwind fluxvector, flux-difference and TVD schemes; boundary conditions.

MAE 717. Microfluidics. 3 Credits.

The course covers mass momentum and energy transport in micro- and nano-scales. Gas transport in the slip, transition and free molecular flow regimes is presented for prototype flows with applications on gas damping of MEMS devices. Electrokinetic transport of liquids and particulate flows are introduced with specific examples on electroosmosis, electrophoresis and dielectrophoresis. Sample handling using chaotic stirring and acoustophoresis in lab on a chip system are demonstrated.

MAE 720. Heat Transfer II. 3 Credits.

Prerequisites: MAE 620. Aspects of conduction, convection and radiation heat transfer, including governing equations, boundary layer flows, analytical and numerical solutions to one-, two- and three-dimensional problems.

MAE 721. Fundamentals of Combustion. 3 Credits.

Prerequisites: MAE 602 and MAE 610. Chemical equilibrium in reacting systems, chemical kinetics of single and multi-step chemical reaction systems, conservation equations for multicomponent reacting systems; Shvab-Zeldovich formulation, detonation and deflagration waves, flammability limits; premixed laminar flames, gaseous diffusion flames; application to engine processes.

MAE 730. Finite Element Analysis II. 3 Credits.

Prerequisites: MAE 630. Application of variational methods to structural mechanics. General finite element development procedures including symbolic computations. Finite element formulations based on alternate variational principles. Applications to plate bending, buckling and vibration. Introduction to non-linear problems.

MAE 731. Mechanics of Composite Structures. 3 Credits.

Stress-strain relations for a lamina; failure theories. Micro-mechanical behavior of a lamina. Constitutive relations of a laminate. Bending, buckling and vibration of laminated plates. Approximate and finite element methods of solution. Prerequisites: MAE 607.

MAE 733. Nonlinear Aerospace Structures. 3 Credits.

Prerequisites: MAE 633 and MAE 634. Classical and finite element analysis methods for nonlinear aerospace structures of beams, plates, and shallow shells. Application to problems of large bending deflection, thermal post-buckling, large amplitude free vibration, nonlinear panel flutter, and nonlinear random response.

MAE 734. Structural Vibrations II. 3 Credits.

Prerequisites: MAE 634. Stationary random processes: autocorrelation and spectral density; ergodic processes and temporal statistics. Structures with single degree-of-freedom. Response of multi-degree-of-freedom and continuous systems. Estimating service life. Introduction to nonlinear vibrations of structures.

MAE 740. Autonomous and Robotic Systems Analysis and Control. 3 Credits.

Kinematics, dynamics and control of complex non-linear electro-mechanical systems, particularly robotic manipulators.

MAE 741. Optimal Control Theory. 3 Credits.

Prerequisites: MAE 640. Parameter optimization, optimization problem for dynamic systems with terminal and path constraints; optimal feedback control with and without the presence of uncertainty; nonlinear optimal control system.

MAE 742. Multibody Dynamics: Theories and Applications. 3 Credits.

Prerequisites: Permission of instructor. Basic theories are presented for formulation of equations of kinematics and dynamics of systems made of interconnected bodies. Topics include constrained motion, principle of virtual work and constrained dynamics. Examples cover robotic motion and biomechanics applications such as human locomotion.

MAE 743. Kinematic Synthesis of Mechanisms. 3 Credits.

Prerequisites: Permission of instructor. Classification of mechanisms; type and number synthesis, application of graph theory, expert systems for synthesis; introduction to dimensional synthesis via path and function generation; finite displacement theory including concept of poles, circlepoint, and centerpoint curves; structural error minimization using Chebychev's approximation; optimization approaches, current applications to robot manipulators, robot hands, space structures, and combustion engines.

MAE 744. Atmospheric Flight Dynamics and Control. 3 Credits.

Prerequisites: MAE 403 or MAE 503 and MAE 604. Principles governing the dynamics and control of vehicles in atmospheric flight. Equations of motion development and solution including inertial/gravitational/aerodynamic/propulsive loads, linear longitudinal and lateral-directional motions, and nonlinear trim and simulation. Flight control system design and analysis incorporating flying quality requirements, linear conventional/contemporary and frequency/time domain techniques for control and guidance functions, validation with nonlinear simulation, gain scheduling.

MAE 745. Space Flight Dynamics and Control. 3 Credits.

Prerequisites: MAE 604 and MAE 640. Principles governing the dynamics and control of vehicles in space flight. Equations of motion development and solution including inertial/gravitational/aerodynamic/propulsive loads, decoupled translational and attitude motions. Orbital mechanics including elements, initial-value propagation, adjustments/transfers, Lambert boundary-value problem, perturbations, and nonlinear simulation. Attitude dynamics including torque free, gravity moment, axisymmetric/unsymmetric vehicles, and dual spinners. Flight control system design and analysis including impulsive velocities, finite burns, Lambert targeting, linear design using momentum wheels, and nonlinear phase-plane design using thrusters.

MAE 746. Advanced Control Methodologies. 3 Credits.

Prerequisites: MAE 640. Review of multivariable dynamic math models including state space, transfer function, and matrix fractions. Multivariable design criteria including stability, performance, and robustness. Theory and application of multivariable control design techniques including LQR/LQG/LTR, H-infinity, Eigenspace Assignment and other advanced methods.

MAE 750. Nanoscale Mechanical and Structural Properties of Materials. 3 Credits.

Elastic and plastic properties of nanoscale materials, strain gradient dislocation plasticity, nanoindentation and nanoindentation creep, thin film mechanical and structural properties, kinetic-based investigations of hardening mechanisms in nanolayer composites.

MAE 751. Fatigue and Fracture. 3 Credits.

Divided into areas of fatigue and fracture; stress-controlled and strain-controlled fatigue; effect of mean stresses, notches, etc.; multiaxial stresses; variable amplitude loading; ductile and brittle fracture; linear elastic fracture mechanics; crack-tip plasticity; fracture testing; applications to fatigue life estimation. Requires permission of the instructor.

MAE 770. Perturbation Methods in Aerospace Engineering. 3 Credits.

Method of multiple scales, derivative expansion, two scales method; generalized method; solvability conditions, acoustic waves in ducts, vibrations of nearly circular membranes, general fourth-order PDE; methods of averaging, KB and KBM methods; canonical variables, LaGrangian and Hamiltonian applications in vibration and wave motion.

MAE 772. Response Surface Methodology. 3 Credits.

Prerequisites: MAE 672. An applied course in response surface methodology with aerospace applications. Empirical model building, method of least squares, second order models, model adequacy checking, canonical analysis. Method of steepest ascent, multiple response optimization. Rotatable, cuboidal and small run designs. Design optimality and efficiency metrics, robust design, restrictions on randomization. Laboratory exercises include RSM applied to wind tunnel testing and optimization.

MAE 780. Engineering Optimization. 3 Credits.

Formulation and solution algorithms for Linear Programming (LP) problems. Unconstrained and constrained nonlinear programming (NLP) problems. Optimum solution for practical engineering systems.

MAE 781. Advanced Design. 3 Credits.

Concepts, principles and procedures related to analysis of stresses and strains in machine components. Consideration of function of parts along with factors such as forces, life required, maximum cost, weight and space restrictions, number of parts to be produced, material selection, kinematics, environmental restrictions. Finite element analysis to illustrate different aspects of stress analysis. Requires permission of the instructor.

MAE 784. Computer Integrated Manufacturing. 3 Credits.

Study of the design, control, and management of integrated production/manufacturing systems. Topics include modeling of production systems; fundamentals of CAD/CAM; robotics, flexible manufacturing systems, group technology, process planning, concurrent engineering, and shop floor control; CIM architecture and communication. Requires permission of the instructor.

MAE 785. Advanced Manufacturing Technology. 3 Credits.

Treatment of the next generation of manufacturing technology. Topics include additive manufacturing; rapid prototyping; electronic manufacturing; micro and nanofabrication; process simulation; product life cycle management; and sustainable design and manufacturing. Prerequisites: MAE 682 or consent of instructor.

MAE 786. Microfabrication. 3 Credits.

Basic principles and hands-on experience of microfabrication technology. Design, fabrication and test of standard microfluidic components. Plastic-based microstructures using CNC/laser machining process. Photolithography technique to selectively remove parts of a thin film. Soft lithography technique to fabricate PDMS-based microstructures.

MAE 787. Life Cycle Engineering. 3 Credits.

Prerequisites: MAE 682. Study of environmental impacts of engineering products and processes throughout their life cycle. Emphasis on life cycle assessment, recycling, reusing, remanufacturing, and economic considerations.

MAE 795. Topics in Mechanical and Aerospace Engineering. 3 Credits.

Selected topics in mechanical and aerospace engineering or engineering mechanics.

MAE 797. Independent Study in Mechanical and Aerospace Engineering. 3 Credits.

Individual analytical, computational and/or experimental study in an area selected by the student. Supervised and approved by the advisor.

MAE 810. Transonic Aerodynamics. 3 Credits.

Prerequisites: MAE 610. Singular surfaces under the Euler limit; transonic breakdown of linearized theory; transonic expansion procedures; transonic small disturbance theory; transonic slender bodies, similarity rules; hodograph equation; transonic far fields; relaxation schemes; unsteady transonic flows, three-dimensional wings; finite difference methods.

MAE 811. Hypersonic Aerodynamics. 3 Credits.

Prerequisites: MAE 610. General consideration of hypersonic flow and similarity principles, hypersonic flow past slender bodies with sharp and blunt leading edges. Hypersonic blunt-body flow. Real gas, viscous and low density effects, and consideration of nonequilibrium phenomena in hypersonic flows.

MAE 812. Unsteady Aerodynamics and Aeroelasticity. 3 Credits.

Prerequisites: MAE 602, MAE 611, and MAE 634. Oscillating airfoils in incompressible, subsonic and supersonic flows; Arbitrary airfoil motion, Oscillating finite wings; Unsteady motion of finite wings; Unsteady motion of nonlifting bodies; Aeroelastic phenomena; Static and dynamic loads, divergence, control reversal, flutter, dynamic response.

MAE 813. Turbulent Flow. 3 Credits.

Prerequisites: MAE 602 and MAE 715 or MAE 815. Isotropic and homogeneous turbulence. Mixing length theories, Equilibrium turbulence models, Two-equations models (k -epsilon). Large eddy simulation. Reynold's stress transport models. Numerical simulations. Compressible and non-equilibrium turbulence effects.

MAE 814. Aerodynamic Flow Control. 3 Credits.

Prerequisites: MAE 602 and MAE 610. Introduction and definitions, goals, passive and active control methodologies and techniques. Flow separation control, drag reduction control techniques, flow transition control. Micro-electrical-mechanical systems (MEMS) control, future challenges.

MAE 815. Boundary Layer Theory. 3 Credits.

Prerequisites: MAE 602. Boundary layer equations; method of matched asymptotic expansions; body oriented coordinates, finite-difference solutions; separations, wake and jet flows; thermal and compressible boundary layers, transformations and finite-difference solutions, unsteady boundary layers. Introduction to hydrodynamic stability and turbulence.

MAE 816. Computational and Fluid Dynamics II. 3 Credits.

Prerequisites: MAE 611. Classification of systems of PDE's; mathematical nature of Euler equations; conservative form of the Navier-Stokes equations; grid generation; central difference schemes; finite volume schemes; upwind fluxvector, flux-difference and TVD schemes; boundary conditions.

MAE 817. Microfluidics. 3 Credits.

The course covers mass momentum and energy transport in micro- and nano-scales. Gas transport in the slip, transition and free molecular flow regimes is presented for prototype flows with applications on gas damping of MEMS devices. Electrokinetic transport of liquids and particulate flows are introduced with specific examples on electroosmosis, electrophoresis and dielectrophoresis. Sample handling using chaotic stirring and acoustophoresis in lab on a chip system are demonstrated.

MAE 820. Heat Transfer II. 3 Credits.

Prerequisites: MAE 620. Aspects of conduction, convection and radiation heat transfer, including governing equations, boundary layer flows, analytical and numerical solutions to one-, two- and three-dimensional problems.

MAE 821. Fundamentals of Combustion. 3 Credits.

Prerequisites: MAE 602 and MAE 610. Chemical equilibrium in reacting systems, chemical kinetics of single and multi-step chemical reaction systems, conservation equations for multicomponent reacting systems; Shvab-Zeldovich formulation, detonation and deflagration waves, flammability limits; premixed laminar flames, gaseous diffusion flames; application to engine processes.

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Prerequisites: MAE 604 and MAE 640. Principles governing the dynamics and control of vehicles in space flight. Equations of motion development and solution including inertial/gravitational/aerodynamic/propulsive loads, decoupled translational and attitude motions. Orbital mechanics including elements, initial-value propagation, adjustments/transfers, Lambert boundary-value problem, perturbations, and nonlinear simulation. Attitude dynamics including torque free, gravity moment, axisymmetric/unsymmetric vehicles, and dual spinners. Flight control system design and analysis including impulsive velocities, finite burns, Lambert targeting, linear design using momentum wheels, and nonlinear phase-plane design using thrusters.

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MAE 880. Engineering Optimization. 3 Credits.

Formulation and solution algorithms for Linear Programming (LP) problems. Unconstrained and constrained nonlinear programming (NLP) problems. Optimum solution for practical engineering systems.

MAE 881. Advanced Design. 3 Credits.

Concepts, principles and procedures related to analysis of stresses and strains in machine components. Consideration of function of parts along with factors such as forces, life required, maximum cost, weight and space restrictions, number of parts to be produced, material selection, kinematics, environmental restrictions. Finite element analysis to illustrate different aspects of stress analysis. Requires permission of the instructor.

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Study of the design, control, and management of integrated production/manufacturing systems. Topics include modeling of production systems; fundamentals of CAD/CAM; robotics, flexible manufacturing systems, group technology, process planning, concurrent engineering, and shop floor control; CIM architecture and communication. Requires permission of the instructor.

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MAE 886. Microfabrication. 3 Credits.

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MAE 887. Life Cycle Engineering. 3 Credits.

Prerequisites: MAE 682. Study of environmental impacts of engineering products and processes throughout their life cycle. Emphasis on life cycle assessment, recycling, reusing, remanufacturing, and economic considerations.

MAE 895. Topics in Mechanical and Aerospace Engineering. 3 Credits.

Selected topics in mechanical and aerospace engineering or engineering mechanics.

MAE 897. Independent Study in Mechanical and Aerospace Engineering. 3 Credits.

Individual analytical, computational and/or experimental study in an area selected by the student. Supervised and approved by the advisor.

MAE 899. PhD Dissertation Research in Mechanical and Aerospace Engineering. 1-9 Credits.

Based on the Ph.D candidate's dissertation research in mechanical and aerospace engineering topics under the direction of the candidate's advisor. Prerequisites: Instructor approval required.

MAE 999. Mechanical and Aerospace Engineering 999. 1 Credit.

A one-hour pass/fail registration required of all graduate students to maintain active status during the final semester prior to graduation. After successfully passing the candidacy examination, all doctoral students are required to be registered for at least one graduate credit each term.

MAPD - Math Pedagogy

MATH PEDAGOGY Courses

MAPD 601. Number and Operations for PK-8 Mathematics Specialists. 3 Credits.

Lecture 3 hours; 3 credits. This course will meet the requirements of students in the Master of Science in Education: PK-8 Mathematics Specialist Endorsement Program, and cannot be used for credit toward any degree offered by the Department of Mathematics and Statistics. The course introduces students to a number of topics in PK-8 mathematics and related pedagogical methods. Acknowledging that learning with understanding occurs through a process of establishing a solid knowledge base upon which to build, students will explore the many and varied ways in which PK-8 students may develop number sense. The focus will be upon the development of best practices for teaching mathematics. This requires that the student have knowledge of the content, use a variety of pedagogical approaches, and be able to select and utilize appropriate manipulatives and technological resources that will foster PK-8 student understanding.

MAPD 602. Geometry and Measurement for PK-8 Mathematics Specialists. 3 Credits.

Lecture 3 hours; 3 credits. This course will meet the requirements of students in the Master of Science in Education: PK-8 Mathematics Specialist Endorsement Program, and cannot be used for credit toward any degree offered by the Department of Mathematics and Statistics. The course introduces students to a number of topics in PK-8 mathematics and related pedagogical methods. Following a "concrete-to-abstract" developmental learning approach, students will explore the mathematical concepts of measurement and geometry in grades PK-8. Emphasis will be placed upon measurement and geometry content knowledge as well as the pedagogical knowledge specific to mathematics teaching and learning. Students will also learn to use appropriate technology.

MAPD 603. Rational Numbers and Proportional Reasoning for PK-8 Mathematics Specialists. 3 Credits.

Lecture 3 hours; 3 credits. This course will meet the requirements of students in the Master of Science in Education: PK-8 Mathematics Specialist Endorsement Program, and cannot be used for credit toward any degree offered by the Department of Mathematics and Statistics. The course introduces students to a number of topics in PK-8 mathematics and related pedagogical methods. It is designed to engage participants in constructing relational understanding between theoretical development of mathematics and students' learning of mathematics in the content strands of rational numbers and proportional reasoning. Students will learn how to select and use manipulatives to connect the concrete phase of mathematical learning to the abstract, symbolic phase. Various technologies will be integrated throughout the course as tools to enhance teaching and student understanding.

MAPD 604. Probability and Statistics for PK-8 Mathematics Specialists. 3 Credits.

Lecture 3 hours; 3 credits. This course will meet the requirements of students in the Master of Science in Education: PK-8 Mathematics Specialist Endorsement Program, and cannot be used for credit toward any degree offered by the Department of Mathematics and Statistics. The course introduces students to a number of topics in PK-8 mathematics and related pedagogical methods. It will focus on the content and processes that support the PK-8 students' learning of probability and statistics. Instruction will cover data collection, display, and analysis as well as the development of a fundamental understanding of probabilistic structures. These structures will be related to real world problem solving and hands-on activities. Technology will be integrated throughout the course to illustrate mathematical concepts, facilitate students exploration, and to make and test hypotheses.

MAPD 605. Algebra and Functions for PK-8 Mathematics Specialists. 3 Credits.

Lecture 3 hours; 3 credits. This course will meet the requirements of students in the Master of Science in Education: PK-8 Mathematics Specialist Endorsement Program, and cannot be used for credit toward any degree offered by the Department of Mathematics and Statistics. The course introduces students to a number of topics in PK-8 mathematics and related pedagogical methods. It will focus on topics that are encountered by middle and high school students as they move from the particular and concrete thinking of school arithmetic to the abstract thinking associated with algebra. The main themes covered include algebraic reasoning, generalization, and justification together with patterns and functions. Various technologies will be integrated within the course content and used as tools to enhance students' understanding of the concepts of algebra.

MATH - Mathematical Sciences

MATHEMATICAL SCIENCES Courses

MATH 500. History of Mathematics. 3 Credits.

This course considers some of the major events in the development of mathematics from ancient times through the seventeenth century, including the discovery of incommensurability, the origins of the axiomatic method, trigonometry, solution of equations, calculation of areas and volumes, analytic geometry, probability, and calculus. Students will be graded on tests which consist mostly of problems typical of the periods considered.

MATH 501. Partial Differential Equations. 3 Credits.

Not available to students with credit in MATH 691. Separation of variable techniques, Sturm-Liouville systems, generalized Fourier series, orthogonal functions of the trigonometric, Legendre and Bessel type boundary value problems associated with the wave equation and the heat conduction equation in various coordinate systems, applications to physics and engineering.

MATH 504. Fundamental Concepts of Geometry. 3 Credits.

Fundamentals of Euclidean and non-Euclidean geometry. Alternatives to Euclidean geometry are examined using a variety of mathematical techniques. Special topics such as "Taxicab" geometry, the hyperbolic plane, the art of M.C. Escher, and the mathematics of maps may be included.

MATH 506. Number Theory and Discrete Mathematics. 3 Credits.

A survey course. Topics include the prime number theorem, congruences, Diophantine equations, continued fractions, quadratic reciprocity, combinatorics, logic, graphs, trees, algorithms, coding and linear programming.

MATH 508. Applied Numerical Methods I. 3 Credits.

An introduction to the numerical methods commonly used by scientists and engineers. Topics include solutions of equations of one variable, direct methods for solving linear systems, matrix factorization, stability analysis, iterative techniques, polynomial interpolation, numerical differentiation and integration, approximation theory, and initial and boundary value problems for ordinary differential equations.

MATH 509. Applied Numerical Methods II. 3 Credits.

Topics include least squares problems, the QR factorization, the conjugate gradient method, Householder transformation and the QR method for approximating eigenvalues and singular values of a matrix. For applications, the finite difference method and the finite element method for solving partial differential equations, trigonometric interpolation and FFT as well as introductory study of optimization are discussed. Prerequisites: A grade of C or better in MATH 508.

MATH 517. Intermediate Real Analysis I. 3 Credits.

A rigorous course in classical real analysis. Topics include the topology of Euclidean n-space, properties of vector valued functions of several variables such as limits, continuity, differentiability and integrability, pointwise and uniform convergence of sequences and series of functions; Fourier series.

MATH 518. Intermediate Real Analysis II. 3 Credits.

A rigorous course in classical real analysis. Topics include the topology of Euclidean n -space, properties of vector valued functions of several variables such as limits, continuity, differentiability and integrability, pointwise and uniform convergence of sequences and series of functions; Fourier series. Prerequisite: A grade of C or better in MATH 517.

MATH 520. Applied Mathematics I: Biomathematics. 3 Credits.

An introduction to current developments in the mathematical investigation of biological problems. Topics include scaling systems of differential equations, stability, perturbation methods, bifurcation phenomena and wave propagation. Applications are chosen from interacting populations, transport and reaction diffusion kinetics, transmission of nerve impulses, and cardiovascular modeling.

MATH 521. Applied Mathematics II: Mathematical Modeling. 3 Credits.

A one semester course in formulating, evaluating and validating mathematical models of physical phenomena. Models of traffic flow, mechanical vibrations, combustion, quantum mechanics, wave propagation or other fields of applied mathematics will be examined. Techniques learned in previous courses are used to simplify, analyze and solve these models. New methods introduced include phase-plane analysis, characteristics, calculus of variations and perturbation methods.

MATH 522. Applied Complex Variables. 3 Credits.

Not available to students with credit in MATH 692. Topics include complex numbers, analytical functions and their properties, derivatives, integrals, series representations, residues and conformal mappings. Applications of the calculus of residues and mapping techniques to the solution of boundary value problems in physics and engineering.

MATH 527. Applied Mathematics III: Elasticity. 3 Credits.

An introduction to the mathematical theory of linear and non-linear elastic continua. Topics include vectors, tensors, deformation, stress, nonlinear constitutive theory, exact solutions, infinitesimal theory, antiplane strain, plane strain, plane stress, extension, torsion, bending and elastic wave propagation.

MATH 528. Applied Mathematics IV: Fluid Mechanics. 3 Credits.

A mathematical investigation of the differential equations governing fluid flow with an emphasis on steady state incompressible flows. The Navier-Stokes equations are derived and some exact solutions are presented including the potential flow solutions. Topics therefore include classical ideal fluid flow and its complex variable representation, various approximations to the Navier-Stokes equations, boundary layer theory, and also surface and internal gravity wave motion, aspects of hydrodynamic stability theory and convection. Other topics may be introduced by the instructor. Corequisite: MATH 501.

MATH 557. Mathematics in Nature. 3 Credits.

A calculus and differential equations based description of many patterns observable in the natural world including wave motion in the air, oceans, rivers, and puddles; rainbows, halos and other meteorological phenomena; arrangement of leaves, petals and branches; height of trees; river meanders; animal and insect markings; mudcracks; spider webs; and others. Partial differential equations will be discussed as needed but a knowledge of ordinary differential equations will be assumed.

MATH 596. Topics in Mathematics. 1-3 Credits.

Study of selected topics. Prerequisite: permission of the instructor.

MATH 598. Tutorial Work in Special Topics in Mathematics. 1-3 Credits.

Independent study under the direction of an instructor including library research and reports. Prerequisite: permission of the instructor.

MATH 605. Complex Variables I. 3 Credits.

An advanced course in complex analysis. Prerequisites: MATH 501, MATH 518 and MATH 522.

MATH 615. Advanced Calculus for Teachers. 3 Credits.

An introduction to real analysis. Topics include the field and order axioms, completeness of the real line, theory of sequences, limits of function, continuity, differentiability, sequences and series of functions, uniform convergence. Prerequisites: MATH 212.

MATH 617. Measure and Integration. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: MATH 518. An introduction to measure theory and integration theory with special emphasis on Lebesgue measure and the Lebesgue integral including Fatou's Lemma, the Monotone Convergence Theorem and the Dominated Convergence Theorem.

MATH 618. Applied Functional Analysis. 3 Credits.

Topics include orthogonal projections to subspaces, duality, the Hahn-Banach theorem and the Banach-Steinhaus theorem, L^2 spaces and convolution operators, fixed point theory, construction of Hilbert spaces, approximation procedures in Hilbert spaces, and spectral theory. Prerequisites: MATH 617.

MATH 620. Optimization Techniques. 3 Credits.

Theory and computational algorithms for the optimization of constrained linear and nonlinear systems or for locating the maximum of a constrained nonlinear function. Applications to problems in economics, operations research and systems theory. Prerequisites: MATH 312 and MATH 316.

MATH 622. Numerical Solutions to Differential Equations. 3 Credits.

An in-depth study of the numerical solution to ordinary and partial differential equations. Topics include linear multi-step methods, Runge-Kutta methods, stiff differential equations, collocation methods, and strong and weak stability analysis for ODEs. For PDEs, finite difference methods are examined. Prerequisites: MATH 509.

MATH 632. Master's Project. 3 Credits.

3 credits. Prerequisite: permission of graduate program director. Under the guidance of a faculty member in the Department of Mathematics and Statistics, the student will undertake a significant data analysis problem in a scientific setting outside the department. A written report and/or public presentation of results will be required.

MATH 637. Tensor Calculus and Differential Geometry. 3 Credits.

Topics include metric spaces, bilinear and quadratic forms, tensors, point manifolds, theory of curves, geodesic differentiation, theory of surfaces, curvature of general manifolds, integrability. Prerequisites: MATH 517.

MATH 638. Mathematical Theories of Continua. 3 Credits.

Topics include deformation, motion, stress, conservation laws, and constitutive theories. Prerequisites: MATH 501 and MATH 637.

MATH 691. Engineering Analysis I. 3 Credits.

Not available to students with credit in MATH 501. Separation of variable techniques, Sturm-Liouville systems, generalized Fourier series, orthogonal functions of the trigonometric, Legendre and Bessel type, boundary value problems associated with the wave equation and the heat conduction equation in various coordinate systems, applications to physics and engineering.

MATH 692. Engineering Analysis II. 3 Credits.

Not available to students with credit in MATH 522. Topics include complex numbers, analytical functions and their properties, derivatives, integrals, series representations, residues and conformal mappings. Applications of the calculus of residues and mapping techniques to the solution of boundary value problems in physics and engineering. Prerequisites: MATH 312.

MATH 693. Engineering Analysis III. 3 Credits.

Advanced topics in the theory and application of ordinary differential equations, distributions, Green's functions, classification of partial differential equations, initial-value problems, eigenfunction expansions for boundary-value problems, selected special functions, singular perturbation theory for differential equations. Prerequisites: MATH 501 or MATH 691.

MATH 695. Seminar in Mathematics. 1-3 Credits.

Seminar in advanced topics. Prerequisites: permission of the instructor.

MATH 696. Topics in Mathematics. 1-3 Credits.

Advanced study of selected topics. Prerequisites: permission of the instructor.

MATH 697. Topics in Mathematics. 1-3 Credits.

Advanced study of selected topics.

MATH 698. Research. 3 Credits.**MATH 699. Thesis. 3 Credits.**

MATH 702. Integral Equations. 3 Credits.

Advanced material in theory and application of integral equations. Formulation of the integral equation problems, cause and effect, connection with differential equations, scattering theory, boundary values of partial differential equations, Fredholm and Volterra theory, expansions in orthogonal functions, theory of Hilbert-Schmidt singular integral equations, method of Wiener-Hopf, monotone operator theory, and direct methods. Prerequisites: MATH 618 and MATH 693.

MATH 705. Numerical Linear Algebra. 3 Credits.

Topics include orthogonal vectors and matrices, norms, singular value decomposition, QR factorization, Gram-Schmidt orthogonalization, least squares problems, condition numbers, stability of backward substitution, stability of least squares algorithm, reduction to Hessenberg or tridiagonal form, and the QR algorithm. Prerequisites: MATH 509.

MATH 720. Advanced Applied Functional Analysis. 3 Credits.

In the first half of this course, several concepts in the classical functional analysis are studied. Topics include Banach Spaces, the dual spaces, the Baire category theorem, the adjoint operator, weak convergence, spectral theory and compact operators. In the second half, at the instructor's discretion, special topics are studied. Possible topics include ill-posed problems, inverse scattering theory, the regular Sturm-Liouville problem and the Dirichlet problem for Laplace's equation. Prerequisites: MATH 617 and MATH 618.

MATH 721. Advanced Applied Numerical Methods I. 3 Credits.

Numerical solutions of partial differential equations and integral equations. For PDEs, the finite difference method, the finite element method and the boundary element method are studied. A priori and a posteriori error estimates are examined. For integral equations, topics include Galerkin methods, collocation methods, and the Petrov-Galerkin method. Prerequisites: MATH 501, MATH 508 and MATH 509.

MATH 722. Advanced Applied Numerical Methods II. 3 Credits.

Numerical solutions of partial differential equations and integral equations. For PDEs, the finite difference method, the finite element method and the boundary element method are studied. A priori and a posteriori error estimates are examined. For integral equations, topics include Galerkin methods, collocation methods, and the Petrov-Galerkin method. Prerequisites: MATH 501, MATH 508 and MATH 509.

MATH 725. Computational Fluid Dynamics and Solid Mechanics. 3 Credits.

An introduction to the theory and methodology of computational fluid dynamics and solid mechanics, with an emphasis on the interplay of the two fields, the study of fluid-structure interactions. Topics will include numerical methods for Navier-Stokes equations, computational techniques for free surfaces, theory of Lagrange multipliers, constrained dynamic problems, fluid-structure coupling problems, differential-algebraic equations, and others. Prerequisites: MATH 501, MATH 508 and MATH 509.

MATH 745. Transform Methods. 3 Credits.

Use of integral transforms for students of applied mathematics, physics and engineering. Integral transforms studied are Laplace, Fourier, Hankel, finite Z-transforms and other special transforms. Prerequisites: MATH 691 and MATH 692.

MATH 750. Calculus of Variations. 3 Credits.

Maximum and minimum techniques in calculus and dynamic programming. Derivation of Euler-Lagrange equations for a variety of conditions, formulation of extremum problems with side conditions for ordinary and partial differential equations. Application to dynamics, elasticity, heat and mass transfer, energy principles and finite element techniques. Prerequisites: MATH 691 and MATH 692.

MATH 755. Introduction to Kinetic Theory and Mesoscopic Methods for Computational Mechanics I. 3 Credits.

The goal of this course is to provide an introduction to kinetic theory and nonequilibrium statistical mechanics, which bridges the microscopic theories and the macroscopic continuum theories of flows. Topics include the molecular dynamics of N particles, Hamiltonian equation, Liouville equation, Boltzmann equation, binary collision, linearized collision operator and its eigen theory, the H-theorem and irreversibility, calculation of the transport coefficients. Prerequisites: permission of the instructor.

MATH 756. Introduction to Kinetic Theory and Mesoscopic Methods for Computational Mechanics II. 3 Credits.

Prerequisites: MATH 755/MATH 855. This is the second part of the study of the interaction between kinetic theory and nonequilibrium statistical mechanics. Models of Boltzmann equation and numerical techniques for hydrodynamic equations (Euler and Navier-Stokes equations) and the Boltzmann equation are studied. Topics include Non-normal and moment method, Maxwell's moment method, BGK model equation, gas mixtures and transport phenomena in mixtures, the Wang-Chang-Uhlenbeck equation, Enskog equation for dense gases, the lattice Boltzmann equation for incompressible flows, the gas-kinetic scheme for compressible flows and the Direct Simulation Monte Carlo (DSMC) method.

MATH 795. Seminar in Mathematics. 1-3 Credits.

Seminar in advanced topics. Prerequisites: permission of the instructor.

MATH 796. Topics in Mathematics. 1-3 Credits.

Advanced study of selected topics. Prerequisites: permission of the instructor.

MATH 797. Topics in Mathematics. 1-3 Credits.

Advanced study of selected topics. Prerequisites: permission of instructor.

MATH 801. Asymptotic and Perturbation Methods. 3 Credits.

Asymptotic and perturbation methods are developed and used to solve linear and nonlinear differential equations. Included are analyses of Duffing's Equation, Van der Pol's Equation, and Mathieu's Equation. Singular perturbation theory and the Method of Matched Asymptotic Expansions are used to solve equations with boundary layer type solutions. Asymptotic expansions of integrals using Laplace's Method, Method of Steepest Descent and Method of Stationary Phase are developed. Applications from all areas of applied mathematics are given. Prerequisites: MATH 693.

MATH 802. Integral Equations. 3 Credits.

Advanced material in theory and application of integral equations. Formulation of the integral equation problems cause and effect, connection with differential equations, scattering theory, boundary values of partial differential equations, Fredholm and Volterra theory, expansions in orthogonal functions, theory of Hilbert-Schmidt singular integral equations, method of Wiener-Hopf, monotone operator theory, and direct methods. Prerequisites: MATH 618 and MATH 693.

MATH 803. Advanced Applied Mathematics I. 3 Credits.

Advanced techniques of mathematics applied to specific topics of physical interest. Examples could include high activation energy asymptotics applied to combustion, singular integral equations applied to fracture mechanics, or bifurcation theory applied to non-linear phenomena such as transition to turbulence, phase transitions and hydrodynamic stability. Prerequisites: MATH 702.

MATH 804. Advanced Applied Mathematics II. 3 Credits.

Advanced techniques of mathematics applied to specific topics of physical interest. Examples could include high activation energy asymptotics applied to combustion, singular integral equations applied to fracture mechanics, or bifurcation theory applied to non-linear phenomena such as transition to turbulence, phase transitions and hydrodynamic stability. Prerequisites: MATH 702.

MATH 805. Numerical Linear Algebra. 3 Credits.

Topics include orthogonal vectors and matrices, norms, singular value decomposition, QR factorization, Gram-Schmidt orthogonalization, least squares problems, condition numbers, stability of backward substitution, stability of least squares algorithm, reduction to Hessenberg or tridiagonal form, and the QR algorithm. Prerequisites: MATH 509.

MATH 817. Mathematical Analysis III. 3 Credits.

Topics in mathematical analysis. Measure and integration; classical Banach spaces; operators on linear spaces; Fourier series and integrals. Prerequisites: MATH 617 and MATH 618.

MATH 820. Advanced Applied Functional Analysis. 3 Credits.

In the first half of this course, several concepts in the classical functional analysis are studied. Topics include Banach Spaces, the dual spaces, the Baire category theorem, the adjoint operator, weak convergence, spectral theory and compact operators. In the second half, at the instructor's discretion, special topics are studied. Possible topics include ill-posed problems, inverse scattering theory, the regular Sturm-Liouville problem and the Dirichlet problem for Laplace's equation. Prerequisites: MATH 617 and MATH 618.

MATH 821. Advanced Applied Numerical Methods I. 3 Credits.

Numerical solutions of partial differential equations and integral equations. For PDEs, the finite difference method, the finite element method and the boundary element method are studied. A priori and a posteriori error estimates are examined. For integral equations, topics include Galerkin methods, collocation methods, and the Petrov-Galerkin method. Prerequisites: MATH 501, MATH 508 and MATH 509.

MATH 822. Advanced Applied Numerical Methods II. 3 Credits.

Numerical solutions of partial differential equations and integral equations. For PDEs, the finite difference method, the finite element method and the boundary element method are studied. A priori and a posteriori error estimates are examined. For integral equations, topics include Galerkin methods, collocation methods, and the Petrov-Galerkin method. Prerequisites: MATH 821.

MATH 823. Approximation and Optimization I. 3 Credits.

Introductory and advanced topics representing current research in approximation and optimization techniques for various application problems. Topics include recent developments in algorithms, their analysis, and applications such as data fitting and pattern separation. Prerequisites: permission of the graduate program director.

MATH 825. Computational Fluid Dynamics and Solid Mechanics. 3 Credits.

An introduction to the theory and methodology of computational fluid dynamics and solid mechanics, with an emphasis on the interplay of the two fields, the study of fluid-structure interactions. Topics will include numerical methods for Navier-Stokes equations, computational techniques for free surfaces, theory of Lagrange multipliers, constrained dynamic problems, fluid-structure coupling problems, differential-algebraic equations, and others. Prerequisites: MATH 501, MATH 508 and MATH 509.

MATH 845. Transform Methods. 3 Credits.

Use of integral transforms for students of applied mathematics, physics and engineering. Integral transforms studied are Laplace, Fourier, Hankel, finite Z-transforms and other special transforms. Prerequisites: MATH 691 and MATH 692.

MATH 850. Calculus of Variations. 3 Credits.

Maximum and minimum techniques in calculus and dynamic programming. Derivation of Euler-Lagrange equations for a variety of conditions, formulation of extremum problems with side conditions for ordinary and partial differential equations. Application to dynamics, elasticity, heat and mass transfer, energy principles and finite element techniques. Prerequisites: MATH 691 and MATH 692.

MATH 855. Introduction to Kinetic Theory and Mesoscopic Methods for Computational Mechanics I. 3 Credits.

The goal of this course is to provide an introduction to kinetic theory and nonequilibrium statistical mechanics, which bridges the microscopic theories and the macroscopic continuum theories of flows. Topics include the molecular dynamics of N particles, Hamiltonian equation, Liouville equation, Boltzmann equation, binary collision, linearized collision operator and its eigen theory, the H-theorem and irreversibility, calculation of the transport coefficients. Prerequisites: permission of the instructor.

MATH 856. Introduction to Kinetic Theory and Mesoscopic Methods for Computational Mechanics II. 3 Credits.

Prerequisites: MATH 755/MATH 855. This is the second part of the study of the interaction between kinetic theory and nonequilibrium statistical mechanics. Models of Boltzmann equation and numerical techniques for hydrodynamic equations (Euler and Navier-Stokes equations) and the Boltzmann equation are studied. Topics include Non-normal and moment method, Maxwell's moment method, BGK model equation, gas mixtures and transport phenomena in mixtures, the Wang-Chang-Uhlenbeck equation, Enskog equation for dense gases, the lattice Boltzmann equation for incompressible flows, the gas-kinetic scheme for compressible flows and the Direct Simulation Monte Carlo (DSMC) method.

MATH 895. Seminar in Mathematics. 1-3 Credits.

1-3 credits. Prerequisite: permission of the instructor.

MATH 896. Topics in Mathematics. 1-3 Credits.

1-3 credits. Prerequisite: permission of the instructor.

MATH 897. Topics in Mathematics. 1-3 Credits.**MATH 898. Research. 1-9 Credits.****MATH 899. Dissertation. 1-9 Credits.****MATH 999. Mathematics 999. 1 Credit.**

1 credit. A one-hour pass/fail registration required of all graduate students to maintain active status during the final semester prior to graduation. After successfully passing the candidacy examination, all doctoral students are required to be registered for at least one graduate credit each term until the degree is complete.

MBA - Master of Business Administration

MASTER OF BUSINESS ADMIN Courses

MBA 600. Introduction to Statistics. 1 Credit.

Introductory course in statistics for newly admitted non-business majors in the MBA Program. Prerequisites: Admission to the MBA Program.

MBA 601. Introduction to Managerial Economics. 1 Credit.

Introductory course in microeconomics for newly admitted non-business majors in the MBA Program. Prerequisite: Admission to the MBA Program.

MBA 602. Introduction to Finance. 1 Credit.

Introductory course in finance for newly admitted non-business majors in the MBA Program. Prerequisite: Admission to the MBA Program.

MBA 603. Introduction to Accounting. 1 Credit.

Introductory course in accounting for newly admitted non-business majors in the MBA Program. Prerequisite: Admission to the MBA Program.

MBA 604. Introduction to Information Management. 1 Credit.

Introductory course in information management for newly admitted non-business majors in the MBA Program. Prerequisite: Admission to the MBA Program.

MBA 620. New Venture Creation. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisites: ACCT 601, BNAL 600, ECON 604, MGMT 602, and MKTG 603. This course will immerse students in the process of conceiving, developing, launching, and running a business. Students will experience the earliest stages of forming a business and learn the mechanisms and factors that lead to successful new ventures. This course will prepare students to intensively create, intelligently evaluate and insightfully manage new ventures.

MBA 621. Effective Business Writing. 1 Credit.

This course is designed to provide an understanding of communications in the management setting. Objectives include improvement of writing skills by understanding major grammar and mechanics errors, understanding the importance of audience, tone and style in professional writing and learning effective letter and memo formats used in professional writing.

MBA 622. Business Plan Development. 1 Credit.

This course is designed to provide an integration of skills needed to develop an effective business plan. Lectures plus students will be assigned clients at the discretion of the instructor. Some students may bring their own projects.

MBA 623. Essential Business Communication Skills. 1 Credit.

This course will introduce students to concepts and discussion of major communication issues that occur in the workplace and will help students to develop skills to deal with communication issues. Course skills would include how to listen effectively, understand nonverbal cues, manage conflict, and communicate non-defensively.

MBA 627. Corporate Compliance. 1 Credit.

This course examines the practical application of business ethics and compliance in the current business environment and the important role that it should play in the decision making process. Topics will include the evolution of business ethics and compliance as a risk mitigation tool, stakeholder expectations, and the structure of corporate compliance programs.

MBA 631. Negotiation. 1 Credit.

Designed to introduce the student to the concept of negotiation; to examine different types of negotiations, strategies and tactics; and to begin developing negotiating skills. Through lectures, class discussions, reading and practical exercises, the student will be introduced to the concepts and structures of different types of negotiations; achieve an understanding of some basic principles of conducting and participating in successful negotiations; and gain experience from participation in negotiation exercises. Prerequisites: MGMT 602 or MGMT 605.

MBA 633. Creative Thinking in Business Decisions. 1 Credit.

Develops understanding and skills in applying a complete process of creative and critical thinking, problem solving and decision making in real world business situations. Uses a disciplined process of thinking, emphasizing both divergence and convergence. Emphasis on the concept of process awareness as distinct from content involvement. Individuals will be better equipped to help their organizations, teams, and selves be more effective, adaptable and flexible in the short and long run.

MBA 634. Communicating with Stakeholders. 1 Credit.

This course is designed to introduce students to the various stakeholders with special focus on larger corporations. The course will discuss tools of communication with stockholders, customers, employees, mass media, and the public at large. It will address how communications, used effectively, can help improve the accountability demanded of today's companies.

MBA 635. Six Sigma. 1 Credit.

Introduction to Six Sigma and its practices. Students will earn Yellow Belt status.

MBA 637. Basics of Business Valuation. 1 Credit.

The course will provide an overview of the practice of the valuation of closely held companies. It will assume a familiarity with basic accounting and finance theory. The course will be an overview of the valuation process covering the reasons for valuation, the data gathering and analysis process, the use of the asset, market and income methods and a focus on some of the key controversial areas of valuation. Prerequisites: FIN 605 or FIN 613.

MBA 638. Spreadsheet Modeling. 1 Credit.

This course introduces students to the use of spreadsheet modeling to analyze and make business decisions. Course topics include spreadsheet design, data analysis for modeling, and Monte Carlo simulation. The course is web-based providing tremendous flexibility for the students. Students will need some proficiency with Excel and must have access to Excel 2007 or higher.

MBA 639. HR Perspective to Professional Development. 1 Credit.

A human resources manager view on the individual professional development process. Topics to be covered include individual self-evaluation paired against corporate mission to develop one's professional path. Tools used and skills developed to get down that path to include resume / portfolio development, mentor / coach skill development through network development, appropriate communications, interviewing, and personal marketing. Students will wrap up the course by reviewing the iterative performance assessment process of evaluating, communicating, and reassessing executed plans to develop next step plans.

MBA 640. Global Entrepreneurship. 1 Credit.

One of the greatest shifts of the 21st century has been the focus on competing at a global scale. The internationalization strategies are led by entrepreneurs and innovators who open new markets, launch breakthrough technologies that impact the world, and -- along the way -- improve humanity. This course investigates the global scale and scope of innovation in companies large and small. It provides a contemporary view of the process of innovation and practice tools with which to tackle change in organizations, markets, communities, and countries. Prerequisites: ECON 604, ECON 612 or ECON 607 and ECON 618, ACCT 601 or ACCT 609 and ACCT 611, MGMT 602 or MGMT 605 and MGMT 612, and MKTG 603 or MKTH 608 and MKTG 617.

MBA 695. Selected Topics for MBA Modules. 1 Credit.

The study of selected topics not offered on a regular basis.

MBA 698. Corporate Field Project. 1-3 Credits.

Students will work with regional firms and non-profits to propose solutions for a real problem facing the firm. Prerequisites: ECON 604, BNAL 600, ACCT 601, and FIN 605.

MBA 999. MBA 999. 1 Credit.

MDS - Movement Disorders

MOVEMENT DISORDERS Courses

MDS 855. Neuroscience of Motor Control. 3 Credits.

Lecture 3 hours; 3 credits. This course covers neuroscience with specific regard to the fundamental design, organization and workings of the central nervous system (CNS) in the areas of motor control and learning. Topics include normal development of motor control and changes in motor control throughout the lifespan. Mechanisms of normal motor learning will also be explored.

MDS 856. Pathology in Motor Control. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: MDS 855. This course expands on the student's knowledge of changes in the central nervous system and motor control problems that occur as a result of congenital conditions, acquired damage, dysfunction or disease. Topics include patterned changes in movement following stroke, spinal cord injury, Parkinson's disease, cerebellar disease, CP, sensory disorders, and other pathologies.

MDS 865. Clinical Issues in Biomechanics I. 3 Credits.

Lecture, 1 hour; Lab, 4 hours. 3 credits. This course will address issues in biomechanics for different patient populations. Each student will choose a clinical group to study and will develop a proposal including a research question and method of approach for answering that question. Students will begin pilot testing their research method in preparation for data collection.

MDS 866. Clinical Issues in Biomechanics II. 3 Credits.

Lecture, 1 hour; Lab 4 hours. 3 credits. Prerequisite: MDS 865. In this course students will perform data collection and analysis following the methods developed in the first course in the series. The product of this semester will include a submission-ready report of the experiment in the format of an appropriate journal.

MDS 875. Instrumentation in Movement Disorders I. 3 Credits.

Lecture, 1 hour; Lab, 4 hours. 3 credits. This course will provide an overview of data collection and analysis systems that can be used to measure movement in individuals with movement disorders. Data collection techniques will include instrumented gait analysis (VICON, GaitRite), and the use of force and balance plates.

MDS 876. Instrumentation in Movement Disorders II. 3 Credits.

Lecture 1 hour, Lab 4 hours. 3 credits. This course will provide an overview of data collection and analysis systems that can be used to measure movement in individuals with movement disorders. Data collection techniques will include kinesiological EMG, accelerometry, the use of load cells, and the metabolic cart.

MDTS - Medical Diagnostic and Translational Sciences

MEDICAL DIAGNOSTIC AND TRANSLATIONAL SCIENCES Courses

MDTS 500. Principles of Molecular Pathology and Clinical Diagnostics. 3 Credits.

Basic concepts of molecular pathology and clinical diagnostics including nucleic acids, DNA replication, transcription, proteins, mutations and chromosome changes that underlie inherited and acquired/infectious disease, inheritance patterns and genetics as applied to oncology, cardiac disease and organ transplants. Covers emerging molecular/ cytologic/histologic methods (amplification, hybridization and microarrays) to detect disease markers, monitor therapy and assess identity; pharmacogenomics and legal/ethical issues of genetic testing. Prerequisites: permission of instructor.

MDTS 501. Molecular Diagnostics Laboratory. 3 Credits.

Course includes hands-on experience with or discussion of diagnostics instrumentation and assays using nucleic acid and protein extraction, gel electrophoresis, hybridization techniques, standard and real time polymerase chain reaction PCR), reverse transcription, DNA sequencing, autoradiography, flow cytometry, microarrays and proteomics-based methods. Pre- or corequisite: MDTS 500 or permission of instructor.

MDTS 600. Advanced Clinical Applications of Molecular Diagnostics. 3 Credits.

Course will cover 1) new applications of standard molecular diagnostic techniques and 2) cutting edge technologies, instrumentation and technical advances, both as applied to clinical case studies. Emphasis will be on pharmacogenomics and disease processes including inherited conditions, cancer, hematopathology, infectious diseases, mental retardation and developmental delay. Innovative technologies covered include comparative genomic hybridization, pyrosequencing and bead based assays Prerequisites: MLRS 500, MLRS 501 or permission of instructor.

MDTS 601. Advanced Molecular Diagnostics Laboratory. 3 Credits.

Emphasis of this course will be on primer design for PCR, advanced real time PCR, cycle sequencing, capillary electrophoresis (CE) as applied to DNA sequencing, analysis of SNPS (single nucleotide polymorphisms), microsatellite instability, microarray technology and detection of methicillin-resistant bacteria. Prerequisites: MDTS 500, MDTS 501 or permission of instructor. Pre- or corequisites: MDTS 600.

MDTS 668. Clinical Laboratory Internship. 3 Credits.

An optional three-week supervised rotation in a hospital-based molecular diagnostic laboratory or a molecular research laboratory. Prerequisites: MDTS 500, MDTS 501, MDTS 600, and MDTS 601 or permission of instructor.

MDTS 714. Molecular Diagnostics Laboratory. 2,3 Credits.

Laboratory rotation with a pre-designated faculty member in which the student obtains hands-on experience. Designed for graduate students to sample different types of research models, techniques, and subject matter without the commitment of dissertation level involvement. Prerequisites: Graduate Program Director approval required.

MDTS 805. Fundamentals of Cancer Biology. 3 Credits.

Course will cover molecular aspects of cancer including DNA damage, tumor viruses, cell cycle regulation, oncogenes and tumor suppressor genes and their respective roles in cancer prevention/development, genes involved in promoting or inhibiting metastasis, angiogenesis, telomeres and telomerase, regulation of both apoptosis and autophagy in normal and cancer cells, cancer stem cells, and diagnostic screening assays for therapeutic responses or resistance in cancer patients. Prerequisites: MDTS 600 and MDTS 601 or equivalents; instructor approval also required.

MDTS 810. Molecular Basis of Health and Disease. 3 Credits.

Emphasis is on human genetic syndromes and disorders associated with dysregulation of key signal transduction pathways that control gene expression, cell growth and protein synthesis including the Ras/MAPK pathway, tuberous sclerosis complex-mammalian target of rapamycin, PI3-kinase and others. Diagnosis, screening and treatment will be covered. Prerequisites: MDTS 600 and MDTS 601.

MDTS 814. Molecular Laboratory Rotation. 2,3 Credits.

Laboratory rotation with a pre-designated faculty member in which the student obtains hands-on experience. Designed for graduate students to sample different types of research models, techniques, and subject matter without the commitment of dissertation level involvement. Prerequisites: Graduate Program Director approval required.

MDTS 895. Topics in Molecular Medicine. 1 Credit.

Student led presentations of current topics related to molecular medicine. Prerequisites: Instructor approval required.

MDTS 898. Molecular Biology Research. 3-6 Credits.

Supervised doctoral research in molecular diagnostics or biomedical studies. Prerequisites: MLRS 600 or MDTS 600 and MLRS 601 or MDTS 601; instructor approval required.

MEDT - Medical Technology

MEDICAL TECHNOLOGY Courses

MEDT 503. Management in the Clinical Setting. 3 Credits.

A course concerned with organization and management in the clinical setting including personnel supervision, planning, equipment justification, quality assurance, data processing, budgeting, fiscal techniques, marketing, regulatory agencies, educational methodologies, current issues, as well as legal and ethical considerations. (This is a writing intensive course.)

MEDT 540. Statistical Applications and Data Analysis in the Clinical Laboratory. 3 Credits.

Topics include review of basic statistics used in the laboratory; use of statistics for quality control, reference range determination, method comparisons, test utility assessment, techniques for searching the literature and assessing quality and applicability of published studies; and data organization and retrieval via queries. Students will perform projects, preferably using actual laboratory data, that relate to lecture topics.

MGMT - Management

MANAGEMENT Courses

MGMT 513. Compensation Management. 3 Credits.

Lecture and discussion 3 hours; 3 credits. Prerequisite: MGMT 602 A study of wage theory, practice and problems. Topics include compensation theory, job analysis, job evaluation, wage surveys, incentive plans, benefit programs and special features of compensation for sales, managerial, professional, and public employees.

MGMT 517. Employment Law. 3 Credits.

Lecture and discussion 3 hours; 3 credits. Prerequisite: MGMT 602. An analysis of how the federal and state governments may regulate the employer-employee relationship. Topics include labor relations law, equal employment opportunity law, other current statutory employment law and common law employment issues.

MGMT 552. Organization Development. 3 Credits.

Lecture and discussion 3 hours; 3 credits. Prerequisites: MGMT 602. Applications of organizational development theory and processes. Topics include OD Theory, role of change agent, intervention processes, the consulting process, and design and implementation of OD change programs.

MGMT 563. Management Seminar Abroad. 3 Credits.

Lecture and discussion 3 hours; 3 credits. Prerequisite: permission of the chief departmental advisor. A study tour abroad under the direction of a faculty member including on-site visits and management lectures designed to provide insight into differences in management practices in foreign countries. Offered summers only and when available.

MGMT 595. Topics. 3 Credits.

MGMT 599. Selected Topics in Human Resources. 3 Credits.

MGMT 602. Organizational Management. 3 Credits.

Lecture 3 hours; 3 credits. Examine issues and principles in the management of individuals, groups, and organizations. Topics include motivation and reward systems, groups dynamics and team building organization design and change.

MGMT 605. Essentials of Leadership. 2 Credits.

This course focuses on providing students with the foundations of leadership by reviewing past leadership research and integrating this into their own understanding of what makes one an effective leader. Contemporary concepts of leadership, including the role of culture and gender, will also be presented. The course will utilize self-assessments, case analysis, and leadership-related readings that will require students to think critically about what leaders do and how their own strengths and limitations influence their personal leadership development. Prerequisites: Admission to the MBA Program, MBA 600, MBA 601, MBA 602, MBA 603, and MBA 604.

MGMT 612. Organizational Behavior. 2 Credits.

This course provides a critical analysis of organizational theories used to understand and predict employee attitudes and behaviors. Implications, in terms of applying theories to address management issues and optimize human resource practices, are evaluated. Topics include job satisfaction, motivation, stress, and decision making. Prerequisites: Admission to the MBA Program, MBA 600, MBA 601, MBA 602, MBA 603, and MBA 604.

MGMT 618. Issues in Human Resource Management. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: MGMT 602 or permission of the instructor. An analysis and evaluation of current human resource practices and problems. Examines topics such as human resource planning, selection, development, and compensation.

MGMT 621. Business Policy and Strategy. 4 Credits.

This course introduces students to the discipline of strategic management and discusses concepts/theories/frameworks that are used in the formulation and implementation of strategies. Additionally, students discuss cases, simulation and examples that describe the strategic issues confronting organizations and how they successfully (or unsuccessfully) resolved them. The course should help students develop a disciplined, rigorous, and comprehensive approach to analyzing firm environment and resources and formulating and implementing strategy. In addition, the course should help students understand the challenges and common pitfalls involved in strategy formulation and implementation. Prerequisites: Admission to the MBA Program, MBA 600, MBA 601, MBA 602, MBA 603, and MBA 604.

MGMT 630. Motivation and Leadership. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: MGMT 602 or permission of the instructor. This course addresses how managers and organizations can enhance employee productivity and job satisfaction in a competitive global environment. Both the theories and practices of motivation and leadership will be examined.

MGMT 668. Management Internship. 1-3 Credits.

1-3 credits. Prerequisites: MGMT 602, graduate standing and permission of the department chair. This course is a practicum in management, applying theories, concepts, and management techniques in a business setting.

MGMT 695. Selected Topics in Management. 1-3 Credits.

1-3 credits. Prerequisite: permission of the department chair and the graduate program director. Study designed for students who have one or more of the required courses waived, or for students desiring additional work in an area of particular interest in management.

MGMT 721. International Strategic Management. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: MGMT 710 or BUSN 800 or permission of the instructor. This course deals with various strategic options available to businesses operating in an international environment. It explores the literature and case materials on multinational companies and the theories and concepts relevant to the analysis of international strategic decisions.

MGMT 750. Business Policy and Strategy. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: permission of the graduate program director. A capstone integrative course on strategy formulation and implementation.

MGMT 821. International Strategic Management. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: MGMT 710 or BUSN 800 or permission of the instructor. This course deals with various strategic options available to businesses operating in an international environment. It explores the literature and case materials on multinational companies and the theories and concepts relevant to the analysis of international strategic decisions.

MGMT 830. Strategic Human Resource Management. 3 Credits.

Lecture 3 hours; 3 credits. The course examines strategic issues in human resource management. The course will examine how strategies and policies in areas such as recruitment, selection, training, career development, performance management and international human resource management influence firm performance. Other topics of current research may also be included.

MGMT 835. Organization Theory. 3 Credits.

Lecture 3 hours; 3 credits. This course examines theories and empirical research on organizations and their environment. Topics would include organization design, structure, decision making, change and adaptation. Other topics of current research may also be included.

MGMT 838. Strategic Entrepreneurship Seminar. 3 Credits.

This doctoral seminar will expose students to the theory and research behind new business creation and corporate entrepreneurship and it will prepare students to do rigorous and relevant research in this particular topic. Prerequisites: MGMT 835.

MGMT 840. Strategy Classics. 3 Credits.

Lecture 3 hours; 3 credits. This course covers the classic texts and papers in the field of strategic management. This course will also include a discussion of the great debates within the field.

MGMT 842. Strategy Content Research. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: MGMT 835 and 840 or departmental approval. This course focuses on research on strategy formation. Topics include business and corporate strategy, competitive dynamics, environmental analysis resource based view, and strategic groups. Other topics of current research may also be included.

MGMT 845. Strategy Content Research. 3 Credits.

MGMT 890. Advanced Topics in Strategy. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisites: MGMT 840 and 842. This course critically evaluates the classical debates and viewpoints within strategic management research. In addition the course would cover the emerging theoretical and methodological areas in strategic management research. Finally, the course would review in depth the research on contemporary issues in strategy. The objective of the course is to enable students to become independent scholars in the area of strategic management.

MGMT 891. Strategic Entrepreneurship Seminar. 3 Credits.

3 credits. Prerequisite: MGMT 835. This doctoral seminar will expose students to the theory and research behind strategic entrepreneurship and prepare them to do rigorous and relevant research in this field of study.

MGMT 896. Selected Topics in Management. 1-3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: MGMT 840. Advanced study in selected topics in management planning, strategy and policy under the direction of one or more faculty in the Management Department.

MGMT 899. Dissertation. 1-9 Credits.

1-9 credits. Ph.D.-level research and writing of dissertation.

MGMT 998. MGMT 998. 1 Credit.

MKTG - Marketing

MARKETING Courses

MKTG 603. Marketing Management. 3 Credits.

Lecture and discussion 3 hours; 3 credits. Fundamentals of marketing (including market research, product design, distribution, pricing and promotion of goods, services, people, places and ideas) with case analyses to clarify applications.

MKTG 608. Fundamentals of Contemporary Marketing. 2 Credits.

This course will discuss fundamental concepts of marketing including product design, distribution, pricing and promotion of goods, marketing of services, and market research. Other contemporary issues in marketing, such as brand equity and customer relationship management, will also be discussed. Selected case analyses will be used to highlight applications. Prerequisites: Admission to the MBA Program, MBA 600, MBA 601, MBA 602, MBA 603, and MBA 604.

MKTG 617. Marketing Strategy. 2 Credits.

This course will build on the fundamentals developed in MKTG 608. It will focus on developing skills to formulate and implement marketing strategies for brands and companies. Marketing mix strategies, segmentation, targeting, and positioning strategies, as well as competitive strategies and contemporary issues in marketing strategy will be discussed. Decision-making skills will be enhanced using case analyses in addition to readings and discussions. Prerequisites: Admission to the MBA Program, MKTG 608, MBA 600, MBA 601, MBA 602, MBA 603, and MBA 604.

MKTG 621. Managerial Problems in Marketing Strategy. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: MKTG 603 or permission of instructor. Lecture, case analysis and discussion of marketing from the business executive's viewpoint. Recent developments in marketing and related disciplines and their application in management. Readings, case analysis, discussion.

MKTG 625. Marketing Research Methods and Analysis. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisites: MKTG 603 and DSCI 600 or permission of instructor. Examines the various methods of marketing research design. Covers experimental methods, sampling procedures, measurement techniques, and other methodological problems in marketing research. The student is introduced to data analysis and statistical modeling programs.

MKTG 628. Marketing of Services. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: MKTG 603 or permission of instructor. This course examines the application of marketing principles and techniques to service organizations. Topics covered include the nature of services, distribution, and promotion considerations. Class discussion revolves around a textbook, cases, and outside readings. Students take part in a major group project which will involve the development of a marketing plan for a service organization.

MKTG 630. Ethics and Marketing Decision-Making. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: MKTG 603 or permission of instructor. Marketers, probably more than other professionals, often are faced with decisions involving an ethical issue. This course has the following objectives: 1) to examine the ethical decision-making process of marketing professionals, 2) to examine the major ethical issues confronting marketers, 3) to provide frameworks to help resolve the ethical dimensions of marketing decisions, and 4) to provide experience in making marketing decisions that involve ethical dilemmas through the use of case studies.

MKTG 640. Global Marketing Management. 3 Credits.

Lecture and discussion 3 hours; 3 credits. Prerequisite: MKTG 603 or permission of instructor. Examines the global environment of business and its potential effects on marketing principles and practices. The course will include the effect of culture on marketing mix strategies.

MKTG 650. Marketing on the Internet. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: MKTG 603. Course examines the application of marketing theories to the internet. Topics include internet marketing strategy, electronic commerce, web page development, and the impact of the internet in the international marketplace.

MKTG 660. Advertising and Integrated Marketing Communications. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: MKTG 603 or permission of instructor. Introduces students to the concepts of integrated marketing communications (IMC). Students will learn how to formulate a firm's marketing communication strategy from an integrated perspective, become familiar with the various tools used in IMC programs, and develop necessary skills to develop an IMC plan for a business. Topics covered in the course include the role of the IMC in the marketing process, the IMC plan development process, the components of IMC media planning and budgeting for IMC, creative strategies, and assessment of the effectiveness of an IMC campaign.

MKTG 668. Marketing Internship. 1-3 Credits.

1-3 credits. Prerequisites: MKTG 603, graduate standing, and permission of instructor. The course is a practicum in the field of marketing, applying theories, concepts, and marketing tools in a business environment.

MKTG 670. Consumer Marketing. 3 Credits.

Lecture 3 hours; 3 credits. Instructor approval required. Prerequisite: MKTG 603. The objective of this course is to understand the key theoretical concepts underlying consumer behavior and measurement of important customer-oriented marketing constructs. The goal is to understand how to apply these findings to substantive marketing problems and programs.

MKTG 696. Selected Topics in Marketing. 1-3 Credits.

3 hours; 3 credits. Prerequisites: permission of the graduate program director. Study designed for students who have had one or more of the required courses waived, or for students desiring additional work in a marketing area of particular interest.

MKTG 801. Seminar in Marketing Theory: History and Current Topics. 3 Credits.

Seminar 3 hours; 3 credits. Prerequisite: MKTG 603. This course focuses on theory development in marketing from the 1940s to the latest publications in marketing journals. The topics covered include philosophy of science, truth in research, the development of marketing theory and practice, and the current direction in marketing theory and research opportunities.

MKTG 802. Seminar in Marketing Concepts and Issues. 3 Credits.

Lecture 3 hours; 3 credits. This course examines the current academic research trends in the different functional areas of the marketing discipline. Topics covered include promotional theory, pricing theory, distribution theory, product theory, marketing strategy theory, marketing ethics, and multinational marketing.

MKTG 803. Seminar in Consumer Behavior. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: MKTG 603. The purpose of this course is to provide a comprehensive and up-to-date understanding of the major research work carried out in consumer behavior. It examines major psychological constructs and phenomena related to consumer behavior and introduces students to various research approaches to consumer behavior issues.

MKTG 813. Fundamentals of Survey Research. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: DSCI 711/811. This course focuses on the fundamental issues associated with survey research as found in the marketing/management disciplines. The topics covered are experimental and quasi-experimental designs, analysis of data from experimental designs, questionnaire design and refinement, and scale development. (cross-listed with DSCI 813).

MKTG 814. Seminar in Advanced Marketing Methodology. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisites: DSCI 811, 812 and MKTG/DSCI 813. This course examines the design, analysis, and implementation of marketing research methods along with advanced statistical techniques. This is an integrative capstone course for the marketing research doctoral sequence of courses. The focus is on ensuring that the marketing academic understands all aspects of data analysis and design issues.

MKTG 826. Seminar in International Marketing Problems. 3 Credits.

Seminar 3 hours; 3 credits. Prerequisite: MKTG 603. An analysis of planning, organization, and control functions of multinational marketing operations and how marketing procedures need to be developed/adapted for effective pursuit of business opportunities in other countries.

MKTG 827. Seminar in Marketing Planning and Strategy. 3 Credits.

Seminar 3 hours; 3 credits. Prerequisite: MKTG 603. Focus on contemporary marketing practice and provides opportunity to acquire a comprehensive understanding of the marketing planning process and the need for development of sound marketing strategy. Marketing goals, strategies, and tactics are examined in detail.

MKTG 895. Selected Topics in Marketing. 3 Credits.

3 credits; 3 hours. Prerequisites: Ph.D. standing and permission of the chair and coordinator. Designed to provide the advanced student with an opportunity to study independently or in small groups and investigate specific topics of current interest in the field of marketing.

MKTG 899. Dissertation Research. 1-12 Credits.

1-12 credits per semester with limitation of 24 credits. Prerequisite: advanced standing in Ph.D. program.

MKTG 998. MKTG 998. 1 Credit.

MPHO - Master of Public Health

MASTER OF PUBLIC HEALTH Courses

MPHO 610. Introduction to Public Health Practice. 1 Credit.

This introductory readings course provides students with an overview of the public health sector from a local, national, and global perspective. The history of public health and recent events leading to a complete transformation of service delivery are two of the topics presented.

MPHO 611. Social and Behavioral Sciences for Public Health. 3 Credits.

Lecture hours 3; 3 credits. This course introduces those social and behavioral science concepts relevant to public health practice. Social and behavioral models that may influence population based health programs are emphasized with projects designed to demonstrate their use.

MPHO 612. Statistical Reasoning for Public Health. 3 Credits.

Lecture hours 3; 3 credits. This course introduces the application of quantitative reasoning in public health practice through the use of descriptive and inferential statistics. Students develop a project to demonstrate the application of statistical reasoning to population health concerns such as health disparities.

MPHO 613. Environmental Sciences for Public Health Practice. 3 Credits.

Lecture 3 hours; 3 credits. This course provides an introduction to the chemical, physical, and biological factors affecting human health and well-being. The application of controls to prevent disease and maximize environmental quality is emphasized.

MPHO 614. Epidemiology for Public Health Practice. 3 Credits.

Lecture 3 hours; 3 credits. This course provides an introduction to the methodology used to detect the incidence and prevalence of disease in populations. The basic principles of epidemiology are presented within an applied concept; projects emphasizing public health practice are assigned.

MPHO 615. Health Services Administration in Public Health. 3 Credits.

Lecture 3 hours; 3 credits. This course covers the application of management concepts to public health systems or settings that use a public health perspective in service delivery. Special emphasis is placed on experiential exercises that integrate management theory with public health practice.

MPHO 620. Aging and Health. 3 Credits.

Lecture 3 hours; 3 credits. This course addresses the aging process using an ecological model of health to examine the impact on individuals and society.

MPHO 630. Social Marketing for Health Populations. 3 Credits.

Lecture 3 hours; 3 credits. This course examines social marketing concepts and tools for influencing health behavior change. Students learn how to design, implement, and evaluate strategies for social marketing campaigns.

MPHO 633. Financing Healthcare. 3 Credits.

Lecture 3 hours; 3 credits. Students will examine financial evaluation of the health care industry, the source of funds, and the effects of changing patient policies. Other topics of interest will be financial strategies, budgets and capital outlay. Cross-listed with CHP 633.

MPHO 650. Global Health Issues. 3 Credits.

Lecture 3 hours; 3 credits. This course includes the political, social, cultural, and ethical issues for disease prevention and health promotion in developing countries. Students learn to identify international health prerogatives aimed at improving health status through education and intervention.

MPHO 656. Addiction Issues in Health Promotion Education. 3 Credits.

Lecture 3 hours; 3 credits. This course focuses on facts about drugs and drug abuse, on value judgments concerning drugs, and on interaction of facts and value judgments. The emphasis is on drug abuse prevention.

MPHO 660. Healthcare Informatics. 3 Credits.

Lecture 3 hours; 3 credits. This course examines the availability, use of interpretation of data obtained from traditional and new data systems used for population health monitoring. Included are public health surveillance systems, vital statistics, hospital discharge data, Health Plan Employer Data and Set (HEDIS), immunization information, school health data, 1996 Health Insurance Portability and Accountability Act (HIPAA), and regulatory agency data related to health.

MPHO 669. Public Health Practicum. 3 Credits.

This course provides students with an opportunity to engage in public health practice in the community or in a working environment. Students who have not work experience may want to consider the practicum as an elective course. Students currently employed in the public health sector may want to use the practicum as an elective to develop a work related project.

MPHO 672. Policy and Politics in Public Health. 3 Credits.

Lecture 3 hours; 3 credits. This course enables the student to develop systematic and analytical frameworks for understanding health and healthcare policy issues. The course will introduce the policy process, background research necessary for policy implementation, and implementation strategies. Cross-listed with HLSC 722.

MPHO 687. Legal Aspects of Health Services. 3 Credits.

Lecture 3 hours; 3 credits. This course provides information concerning the legal requirements affecting the health care industry. The course provides a survey of the basic concepts and content in the major areas of health law, an explanation and identification of sources of legal authority, and a familiarity with legal language.

MPHO 688. Grant Writing for Public Health Practice. 3 Credits.

Covers issues and problems concerned with the development of grants and contracts as they relate to the health professions. The course focuses on the multiple roles of funding agencies and the importance of matching the interests of the grant seeker with the corresponding funding agency.

MPHO 689. Capstone Project. 3-6 Credits.

3-6 credit hours. The Capstone Project must be taken as the final course for the MPH degree. In this course a student works with a faculty preceptor and a community preceptor to produce a product useful to public health practice in environmental health (e.g. a paper, a manuscript, a grant, complete an internship, a work related project). The student must also complete a portfolio containing an activity log and relevant information gathered over the course of study to demonstrate the mastery of theoretical and applied concepts.

MPHO 691. Grant Writing for Public Health Practice. 3 Credits.

Lecture 3 hours; 3 credits. This course provides an introduction to grants and contracts useful on public health practice. Guidelines for funding development will be examined and students will write a grant. Those students with little or no experience in grant writing are encouraged to take this course as an elective or take the capstone for 3 credit hours thereby leaving room in the course of study for this course.

MPHO 695. Topics in Public Health. 1-3 Credits.

MSCM - Maritime and Supply Chain Management

MARITIME AND SUPPLY CHAIN MANAGEMENT Courses

MSCM 530. Strategic Sourcing and Purchasing Management. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisites: ACCT 601 and OPMT 611.

An overview of the strategic sourcing of materials and services in the organization and its role in the supply chain. Topics include sourcing decisions, price/cost analysis, quality issues, purchasing, supplier selection, legal and ethical issues, third party logistics, freight forwarding, and acquisition of services and capital assets.

MSCM 568. Distribution Center and Material Handling Management. 3 Credits.

This course is designed to investigate the strategic role of distribution center and material management in the supply chain. Course content includes the analysis of distribution center operations through the study of design, system selection, and layout configuration as well as the evaluation of material handling and inventory management options. Pre- or corequisite: MSCM 441 or BNAL 441 or permission of the instructor.

MSCM 595. Topics in Maritime and Supply Chain Management. 3 Credits.

3 credits. Prerequisite: Permission of the instructor. A study of selected topics within maritime and supply chain management designed to provide an in-depth exploration of current issues.

MSCM 610. International Shipping and Supply Chain Management. 3 Credits.

Lecture 3 hours; 3 credits. Examines international freight transportation and terms for movement of international trade; focuses on improving supply chain relationships in the movement of international trade/directing the flow of information, materials and products. (cross-listed with PORT 610).

MSCM 615. Maritime Security and Risk Analysis. 3 Credits.

Lecture 3 hours; 3 credits. An overview of international and U.S initiatives to ensure the security of vessels, cargo, people, and infrastructure within the maritime domain. In addition to the impacts of regulatory requirements on maritime commerce, the course also addresses maritime threats to the international economy (including maritime piracy and maritime terrorism), maritime coalitions, and state-of-the-art techniques and tools for safeguarding oceanborne commerce. (cross-listed with PORT 615).

MSCM 616. Supply Chain and Reverse Logistics. 3 Credits.

Lecture 3 hours; 3 credits. This course explores Supply Chain and Reverse Logistics concepts related to quantitative models and Modeling and Simulation (M&S) to provide solutions to common and complex problems faced by businesses and government agencies. (cross-listed with PORT 616).

MSCM 617. Transportation Intermediaries. 3 Credits.

Lecture 3 hours; 3 credits. An overview of the document, role and functions of transportation intermediaries. The relationships between intermediaries, carriers and shippers are discussed as well as the major intermediaries and their competitive strategies. The customers of various international trade and supply chains of intermediaries are also discussed. (cross-listed with PORT 617).

MSCM 641. Supply Chain Management and Logistics. 3 Credits.

Prerequisites: OPMT 611 or instructor's permission. Supply chain management integrates all activities associated with the flow of materials and information from product start to customers. Examples include order processing, warehousing, inventory management, transportation and logistics, and the costs and information systems supporting these activities. Particular application is made to global logistics systems supporting port and maritime activities. Supply chain relationships can be improved through effective integration of management and via such technologies as the World Wide Web, electronic data exchange, and enterprise resource planning (ERP). (cross-listed with DSCI 641).

MSCM 890. Seminar in Business Process and Enterprise Systems. 3 Credits.

Prerequisites: IT 800 or DSCI 800. This course discusses how firms achieve business excellence through business process management (BPM), business process improvement (BPI), and business process reengineering (BPR) supported by IT. Topics include business process and workflow modeling, analysis, integration, monitoring and management.

MSCM 893. Seminar in Supply Chain in E-Business. 3 Credits.

Prerequisites: IT 800. This course examines the development of information technologies related to supply chain management in a global e-business environment. Topics include managing material flow processes, maritime, logistics, procurement, inventory and distribution. (cross-listed with IT 893).

MSIM - Modeling and Simulation

MODELING AND SIMULATION Courses

MSIM 506. Introduction to Distributed Simulation. 3 Credits.

An introduction to distributed simulation. Topics include motivation for using distributed simulation, distributed simulation architectures, time management issues, and distributed simulation approaches. Current standards for distributed simulation are presented.

MSIM 508. Introduction to Game Development. 3 Credits.

Requires an understanding of physics and either CS 361 or MSIM 331. An introductory course focused on game development theory and modern practices with emphasis on educational game development. Topics include game architecture, computer graphics theory, user interaction, audio, high level shading language, animation, physics, and artificial intelligence. The developed games can run on a variety of computer, mobile, and gaming platforms.

MSIM 510. Model Engineering. 3 Credits.

The goal of this course is to develop understanding of the various modeling paradigms appropriate for capturing system behavior and conducting digital computer simulation of many types of systems. The techniques and concepts discussed typically include UML, concept graphs, Bayesian nets, Markov models, Petri nets, system dynamics, Bond graphs, etc. Students will report on a particular technique and team to implement a chosen system model. (cross-listed with ECE 510).

MSIM 541. Computer Graphics and Visualization. 3 Credits.

The course provides a practical treatment of computer graphics and visualization with emphasis on modeling and simulation applications. It covers computer graphics fundamentals, visualization principles, and software architecture for visualization in modeling and simulation. Pre- or corequisites: CS 250 and MSIM 603.

MSIM 551. Analysis for Modeling and Simulation. 3 Credits.

An introduction to analysis techniques appropriate to the conduct of modeling and simulation studies. Topics include input modeling, random number generation, output analysis, variance reduction techniques, and experimental design. In addition, techniques for verification & validation are introduced. Course concepts are applied to real systems and data.

MSIM 562. Introduction to Medical Image Analysis. 3 Credits.

Introduction to basic concepts in medical image analysis. Medical image registration, segmentation, feature extraction, and classification are discussed. Basic psychophysics, fundamental ROC analysis and FROC methodologies are covered. Cross-listed with ECE 462/562.

MSIM 563. Design and Modeling of Autonomous Robotic Systems. 3 Credits.

Course focuses on autonomous robotics systems with emphasis on using modeling and simulation (M&S) for system level design and testing. Fundamental concepts associated with autonomous robotic systems are discussed. Course topics include: robotic control, architectures, and sensors as well as more advanced concepts such as error propagation, localization, mapping and autonomy. Design strategies that leverage M&S to accelerate the development and testing of sophisticated autonomous robotic algorithms for individual or teams of robots are covered. Pre- or corequisite: CS 150.

MSIM 570. Foundations of Cyber Security. 3 Credits.

Course provides an overview of theory, tools and practice of cyber security and information assurance through prevention, detection and modeling of cyber attacks and recovery from such attacks. Techniques for security modeling, attack modeling, risk analysis and cost-benefit analysis are described to manage the security of cyber systems. Fundamental principles of cyber security and their applications for protecting software and information assets of individual computers and large networked systems are explored. Anatomy of some sample attacks designed to compromise confidentiality, integrity and availability of cyber systems are discussed. Pre- or corequisites: MSIM 510 or permission of the instructor.

MSIM 595. Topics in Modeling and Simulation Engineering. 3 Credits.

Special topics of interest with emphasis placed on recent developments in modeling and simulation engineering.

MSIM 596. Topics in Modeling and Simulation Engineering. 1-3 Credits.

Special topics of interest with emphasis placed on the recent developments in modeling and simulation engineering. Prerequisites: permission of the instructor.

MSIM 597. Independent Study in Modeling and Simulation Engineering. 3 Credits.

Individual analytical, computational, and/or experimental study in an area selected by the student. Supervised and approved by the advisor.

MSIM 601. Introduction to Modeling and Simulation. 3 Credits.

Modeling and simulation (M&S) discipline surveyed at an overview level of detail. Basic terminology, modeling methods, and simulation paradigms are introduced. Applications of M&S in various disciplines are discussed. The course provides a general conceptual framework for those interested in using M&S and for further studies in M&S. Not open to MSVE degree seeking students. Prerequisites: graduate standing; undergraduate exposure to calculus and probability & statistics.

MSIM 602. Simulation Fundamentals. 3 Credits.

An introduction to the modeling and simulation discipline. Introduction to discrete event simulation (DES) including simulation methodology, input data modeling, output data analysis, and an overview of DES tools. Introduction to continuous simulation (CS) including simulation methodology, differential equation models, numerical solution techniques, and an overview of CS tools. Prerequisites: graduate standing; undergraduate preparation in calculus and probability & statistics; and computer literacy.

MSIM 603. Simulation Design. 3 Credits.

Course develops the computer software skills necessary for the design and development of simulation software. Topics covered include software architectures, software engineering, software design, object-oriented programming, abstract data types and classes, data structures, algorithms, and testing and debugging techniques. Software design and development of simulation systems (discrete-event, continuous, and Monte Carlo) are emphasized. Prerequisite: MSIM 602 and an introductory computer programming course.

MSIM 607. Machine Learning I. 3 Credits.

Course provides a practical treatment of design, analysis, implementation and applications of algorithms. Topics include multiple learning models: linear models, neural networks, support vector machines, instance-based learning, Bayesian learning, genetic algorithms, ensemble learning, reinforcement learning, unsupervised learning, etc. (Cross listed with ECE 607).

MSIM 660. System Architecture and Modeling. 3 Credits.

Students will learn the essential aspects of the system architecture paradigm through environment and analysis of multiple architecture framework and enterprise engineering, such as IDEFO, TOGAF, DODAF and OPM. Emphasis on system modeling and enterprise engineering. (Cross listed with ENMA 660).

MSIM 667. Cooperative Education. 1-3 Credits.

Available for pass/fail grading only. Student participation for credit based on academic relevance of the work experience, criteria, and evaluation procedures as formally determined by the program and the Cooperative Education/Career Management program prior to the semester in which the work experience is to take place.

MSIM 669. Practicum. 1-3 Credits.

Academic requirements will be established by the graduate program director and will vary with the amount of credit desired. Allows students an opportunity to gain short-duration career related experience. Student is usually employed—this is an additional project beyond the duties of the student's employment.

MSIM 671. Cyber Systems Engineering. 3 Credits.

Course provides an overview of functioning of cyber systems including how a computer interacts with the outside world. The composition of critical infrastructure and functioning of different engineered systems that form critical infrastructure are discussed. Mutual dependence and interactions between cyber systems and other engineered systems and the resulting security risks are also explored. (Cross-listed with ENMA 671).

MSIM 672. Threat Modeling and Risk Analysis. 3 Credits.

Course discusses how to develop cyber threat models using attack graphs/trees, STRIDE, Universal Modeling Language (UML), attack graphs/trees and common of risk analysis tools. Course also discusses the need for quantitative security analysis and formal validation of security models and basic principles of formal model validation. (Cross-listed with ENMA 672).

MSIM 695. Topics in Modeling and Simulation. 3 Credits.

Special topics of interest with emphasis placed on recent developments in modeling and simulation.

MSIM 697. Independent Study in Modeling and Simulation. 3 Credits.

Individual study selected by the student. Supervised and approved by a faculty member with the approval of the graduate program director. Prerequisites: permission of instructor or graduate program director.

MSIM 699. Thesis. 1-6 Credits.

Research leading to the Master of Science thesis. Prerequisites: permission of instructor and graduate program director.

MSIM 702. Methods of Rational Decision Making. 3 Credits.

The course covers advanced methods in Operation Research and Optimization. Focus will be on developing models and their application in different domains including manufacturing and services. (Cross listed with ENMA 702/ENMA 802.).

MSIM 711. Finite Element Analysis. 3 Credits.

Prerequisites: permission of the instructor. The purpose of the course is to provide an understanding of the finite element method (FEM) as derived from an integral formulation perspective. The course will demonstrate the solutions of (1-D and 2-D) continuum mechanics problems such as solid mechanics, fluid mechanics and heat transfer.

MSIM 715. High Performance Computing and Simulations. 3 Credits.

Introduction to modern high performance computing platforms including top supercomputers and accelerators. Discussion of parallel architectures, performance, programming models, and software development issues. Case studies of scientific and engineering simulations will be explored. Students will have an opportunity to work on parallelization of problems from their research areas. Project presentations are required.

MSIM 722. Cluster Parallel Computing. 3 Credits.

This course provides detailed numerical step-by-step procedures to exploit parallel and sparse computation under MPI (Message, Passing, Interface) computer environments. Large-scale engineering/science applications are emphasized. Simultaneous linear equations are discussed.

MSIM 725. Principles of Combat Modeling and Simulation. 3 Credits.

Principles of combat modeling and simulation. Introduction including history, basic definitions, and best practice. Algorithms for modeling movement, sensing effects and behavior. Overview of modern combat models. Interoperability and integration into operational environments. Prerequisites: MSIM 603.

MSIM 730. Simulation Formalisms. 3 Credits.

The focus of the course is on identification and investigation of mathematical and logical structures that form the foundation for computational simulation. Topics include: foundations of simulation theory in logic, discrete mathematics, and computability; simulation formalisms, including DEVS; interoperability protocols; and computational complexity.

MSIM 741. Principles of Visualization. 3 Credits.

Well-designed graphical media capitalizes on human facilities for processing visual information and thereby improves comprehension, memory, inference, and decision making. This course teaches techniques and algorithms for creating effective visualizations based on principles and techniques from graphic design, visual art, perceptual psychology and cognitive science. Both users and developers of visualization tools and systems will benefit from this course.

MSIM 742. Synthetic Environments. 3 Credits.

The course covers the theory and techniques for building effective and efficient synthetic environments for modeling and simulation applications. Topics include physics, artificial intelligence, virtual reality, and advanced modeling and rendering. The emphasis is on producing visually realistic synthetic environments based on effective approximations of physics and other related principles. Prerequisites: MSIM 541 or equivalent.

MSIM 751. Advanced Analysis for Modeling and Simulation. 3 Credits.

An introduction to stochastic dependence and Bayesian analysis techniques for conducting modeling and simulation studies. Topics include: measures of dependence, common multivariate distributions, sampling from multivariate distributions, elementary time series models and Bayesian statistics. Prerequisites: MSIM 451 or MSIM 551.

MSIM 762. Applied Medical Image Analysis. 3 Credits.

Course explores hands-on exposure to state-of-the-art algorithms in medical image analysis, which builds on open-source software (Insight Segmentation and Registration Toolkit - ITK), as well as the principles of medical image acquisition in the modalities of clinical interest. Medical imaging modalities - X-rays, CT, and MRI/ITK image pipeline; image enhancement, feature detection; segmentation - basic techniques, feature-based classification and clustering, graph cuts, active contour and surface models; surface and volume meshing; registration - transformations, similarity criteria; shape and appearance models are all explored and discussed in this course. Prerequisites: Knowledge of C++ and object-oriented programming.

MSIM 772. Modeling Global Events. 3 Credits.

Modeling Global Events introduces modeling and simulation as a tool for expanding our understanding of events that have shaped the global environment of the 21st century. Students will review real-world case studies and then analyze these case studies via system dynamics, agent-based, social network, and game theory modeling paradigms. This course is designed to develop empirical research skills, conceptual modeling expertise, and model construction. Students will understand how to analyze, verify, and validate a model.

MSIM 773. Networked System Security. 3 Credits.

Course presents an overview of theory, techniques and protocols that are used to ensure that networks are able to defend themselves and the end-systems that use networks for data and information communication. Modeling of threats to networked systems, attack modeling with attack trees/graphs, cyber physical systems survivability to attacks, and behavior modeling of malware are explored. Network simulation/emulation using tools such as Scalable Simulation Framework (SSFNet), OPNET, or NS3 are examined. Application of industry-standard security protocols, such as Secure Socket Layer (SSL), Transport Layer Security (TLS), IP-Security (IPSec), Public Key Infrastructure (PKI), WEP, WPA, etc. for engineering the security of networked systems will also be discussed.

MSIM 774. Transportation Network Flow Models. 3 Credits.

This course provides a rigorous introduction to transportation network modeling, with special emphasis on network equilibrium problems. Topics include: elementary graph theory, shortest path problem nonlinear optimization, optimization of univariate functions, deterministic and stochastic user equilibrium. (Cross-listed with CEE 774 and MSIM 774).

MSIM 775. Computational Methods for Transportation Systems. 3 Credits.

Fundamental models and algorithms in optimization, stochastic modeling and parallel computing will be discussed and illustrated with transportation applications. (Cross-listed with CEE 775 and CEE 875).

MSIM 776. Simulation Modeling in Transportation Networks. 3 Credits.

Principles of simulation modeling, microscopic, mesoscopic, and macroscopic traffic simulation models. Course explores driver behavior in networks, calibration and validation of traffic simulation models, and use of traffic simulation software.

MSIM 795. Topics in Modeling and Simulation. 3 Credits.

Special topics of interest with emphasis placed on recent developments in modeling and simulation.

MSIM 797. Independent Study in Modeling and Simulation. 3 Credits.

Individual study selected by the student. Supervised and approved by a faculty member with the approval of the graduate program director. Prerequisites: permission of instructor or graduate program director.

MSIM 802. Methods of Rational Decision Making. 3 Credits.

The course covers advanced methods in Operation Research and Optimization. Focus will be on developing models and their application in different domains including manufacturing and services. (Cross listed with ENMA 702/ENMA 802.).

MSIM 811. Finite Element Analysis. 3 Credits.

Prerequisites: permission of the instructor. The purpose of the course is to provide an understanding of the finite element method (FEM) as derived from an integral formulation perspective. The course will demonstrate the solutions of (1-D and 2-D) continuum mechanics problems such as solid mechanics, fluid mechanics and heat transfer.

MSIM 815. High Performance Computing and Simulations. 3 Credits.

Introduction to modern high performance computing platforms including top supercomputers and accelerators. Discussion of parallel architectures, performance, programming models, and software development issues. Case studies of scientific and engineering simulations will be explored. Students will have an opportunity to work on parallelization of problems from their research areas. Project presentations are required.

MSIM 822. Cluster Parallel Computing. 3 Credits.

This course provides detailed numerical step-by-step procedures to exploit parallel and sparse computation under MPI (Message, Passing, Interface) computer environments. Large-scale engineering/science applications are emphasized. Simultaneous linear equations are discussed.

MSIM 825. Principles of Combat Modeling and Simulation. 3 Credits.

Principles of combat modeling and simulation. Introduction including history, basic definitions, and best practice. Algorithms for modeling movement, sensing effects and behavior. Overview of modern combat models. Interoperability and integration into operational environments. Prerequisites: MSIM 603.

MSIM 830. Simulation Formalisms. 3 Credits.

The focus of the course is on identification and investigation of mathematical and logical structures that form the foundation for computational simulation. Topics include: foundations of simulation theory in logic, discrete mathematics, and computability; simulation formalisms, including DEVS; interoperability protocols; and computational complexity.

MSIM 841. Principles of Visualization. 3 Credits.

Well-designed graphical media capitalizes on human facilities for processing visual information and thereby improves comprehension, memory, inference, and decision making. This course teaches techniques and algorithms for creating effective visualizations based on principles and techniques from graphic design, visual art, perceptual psychology and cognitive science. Both users and developers of visualization tools and systems will benefit from this course.

MSIM 842. Synthetic Environments. 3 Credits.

The course covers the theory and techniques for building effective and efficient synthetic environments for modeling and simulation applications. Topics include physics, artificial intelligence, virtual reality, and advanced modeling and rendering. The emphasis is on producing visually realistic synthetic environments based on effective approximations of physics and other related principles. Prerequisites: MSIM 541 or equivalent.

MSIM 851. Advanced Analysis for Modeling and Simulation. 3 Credits.

An introduction to stochastic dependence and Bayesian analysis techniques for conducting modeling and simulation studies. Topics include: measures of dependence, common multivariate distributions, sampling from multivariate distributions, elementary time series models and Bayesian statistics. Prerequisites: MSIM 451 or MSIM 551.

MSIM 862. Applied Medical Image Analysis. 3 Credits.

Course explores hands-on exposure to state-of-the-art algorithms in medical image analysis, which builds on open-source software (Insight Segmentation and Registration Toolkit - ITK), as well as the principles of medical image acquisition in the modalities of clinical interest. Medical imaging modalities - X-rays, CT, and MRI/ITK image pipeline; image enhancement, feature detection; segmentation - basic techniques, feature-based classification and clustering, graph cuts, active contour and surface models; surface and volume meshing; registration - transformations, similarity criteria; shape and appearance models are all explored and discussed in this course.

MSIM 872. Modeling Global Events. 3 Credits.

Modeling Global Events introduces modeling and simulation as a tool for expanding our understanding of events that have shaped the global environment of the 21st century. Students will review real-world case studies and then analyze these case studies via system dynamics, agent-based, social network, and game theory modeling paradigms. This course is designed to develop empirical research skills, conceptual modeling expertise, and model construction. Students will understand how to analyze, verify, and validate a model.

MSIM 873. Networked System Security. 3 Credits.

Course presents an overview of theory, techniques and protocols that are used to ensure that networks are able to defend themselves and the end-systems that use networks for data and information communication. Modeling of threats to networked systems, attack modeling with attack trees/graphs, cyber physical systems survivability to attacks, and behavior modeling of malware are explored. Network simulation/emulation using tools such as Scalable Simulation Framework (SSFNet), OPNET, or NS3 are examined. Application of industry-standard security protocols, such as, Secure Socket Layer (SSL), Transport Layer Security (TLS), IP-Security (IPSec), Public Key Infrastructure (PKI), WEP, WPA, etc. for engineering the security of networked systems will also be discussed.

MSIM 874. Transportation Network Flow Models. 3 Credits.

This course provides a rigorous introduction to transportation network modeling, with special emphasis on network equilibrium problems. Topics include: elementary graph theory, shortest path problem nonlinear optimization, optimization of univariate functions, deterministic and stochastic user equilibrium. (Cross-listed with CEE 774 and CEE 874).

MSIM 875. Computational Methods for Transportation Systems. 3 Credits.

Fundamental models and algorithms in optimization, stochastic modeling and parallel computing will be discussed and illustrated with transportation applications. (Cross-listed with CEE 775 and CEE 875).

MSIM 876. Simulation Modeling in Transportation Networks. 3 Credits.

Principles of simulation modeling, microscopic, mesoscopic, and macroscopic traffic simulation models. Course explores driver behavior in networks, calibration and validation of traffic simulation models, and use of traffic simulation software.

MSIM 892. Doctor of Engineering Project. 1-9 Credits.

Directed individual study applying advanced level technical knowledge to identify, formulate and solve a complex, novel problem in Modeling and Simulation.

MSIM 895. Topics in Modeling and Simulation. 3 Credits.

Special topics of interest with emphasis placed on recent developments in modeling and simulation.

MSIM 897. Independent Study in Modeling and Simulation. 1-3 Credits.

Individual study selected by the student. Supervised and approved by a faculty member with the approval of the graduate program director. Prerequisites: permission of the instructor or graduate program director.

MSIM 898. Research in Modeling and Simulation. 1-12 Credits.

Supervised research prior to passing Ph.D. candidacy exam. Prerequisites: permission of the instructor and graduate program director.

MSIM 899. Dissertation. 1-12 Credits.

Prerequisites: permission of the instructor and graduate program director. Directed research for the doctoral dissertation.

MSIM 999. Modeling and Simulation 999. 1 Credit.

A one-hour pass/fail registration required of all graduate students to maintain active status during the final semester prior to graduation. After successfully achieving "candidate" status, all doctoral students are required to be registered for at least one graduate credit each term until the degree is complete.

MUSA - Music, Applied

MUSIC, APPLIED Courses

MUSA 651. Advanced Applied Music. 3 Credits.

Graduate level applied performance level lesson. Prerequisites: MUSC 452 or equivalent and permission of faculty; audition required.

MUSA 652. Advanced Applied Music. 3 Credits.

Graduate level applied performance lesson. Completion of this level includes successful performance of a one-hour public recital. Prerequisites: MUSC 651 or permission of the instructor; audition required.

MUSC - Music

MUSIC Courses

MUSC 510. Psychology of Music. 3 Credits.

This course is designed to assist students in enhancing their understanding of the aesthetic response to music in various settings. Students will learn to integrate their understanding of musical aptitude as it relates to human growth and development. In addition, students will study the psychological implication of personality types as they develop, implement, and assess their pedagogical approach.

MUSC 522. Form and Analysis. 2 Credits.

Aural analysis study and analysis of the principal traditional musical forms. Stylistic and harmonic analysis as it related to score study will be discussed.

MUSC 528. Music Theory Review. 3 Credits.

A review of basic music theory with more advanced work in music analysis. The course is primarily for students in the M.M.E. in Education degree program. This course is required for those students who do not pass the Theory Placement Test. No credit for this course may be applied toward the degree.

MUSC 545. Applied Music Pedagogy. 1 Credit.

Teaching techniques, literature in the performing area. Seminar deals with resource materials. Laboratory: observation and teaching under supervision. Prerequisites: senior standing, music major, or permission of the department.

MUSC 560. History of Jazz. 3 Credits.

This course will study the historical development of jazz as an American art form. The emotion and meaning of this style will be investigated as well as the historical and contemporary aesthetic response. Emphasis will include the defining role of African American artists. The influence of jazz on the development of contemporary American music will be discussed. A research paper will be required.

MUSC 566. Modern Music. 3 Credits.

A study of the techniques and styles in music in the twentieth and twenty first century. (offered fall, even years).

MUSC 591. Music in the Baroque Era. 3 Credits.

A study of music history from monody through the works of Bach and Handel. A discussion of musical style within the context of cultural history. (offered spring semesters, odd years).

MUSC 592. Music in the Classical Era. 3 Credits.

A study of music history from the Rococo Period through the works of Haydn, Mozart and Beethoven. A discussion of musical style within the context of cultural history. (fall semesters, odd years).

MUSC 594. Music in the Romantic Era. 3 Credits.

A study of music history from the late works of Beethoven to Mahler and Strauss. A discussion of musical style within the context of cultural history. (offered spring, even years).

MUSC 595. Topics in Music. 1-3 Credits.

These courses will appear in the course schedule. Course descriptions and prerequisites for each course may be found in information distributed to all academic advisors.

MUSC 596. Topics in Music. 1-3 Credits.

These courses will appear in the course schedule. Course descriptions and prerequisites for each course may be found in information distributed to all academic advisors.

MUSC 600. Introduction to Graduate Research. 1 Credit.

This course should be taken among the first courses in the M.M.E. Program. Introduces graduate students to basic skills in Music Education research, including bibliographic searches, on-line searches, computer data analysis, and conventions of scholarly writing for reporting findings. Pre- or corequisite: MUSC 630.

MUSC 602. Analytical Techniques. 3 Credits.

Prerequisites: Baccalaureate degree in music or permission of department chair and instructor. Examines techniques and concepts applied to compositions of the eighteenth, nineteenth, and twentieth centuries as well as modern music, through analysis of contrapuntal and harmonic textures, form, and performance practice.

MUSC 603. Principles of Music Education. 3 Credits.

Methods, techniques, principles, and tools of music education, with reference to various types of school situations. Prerequisite: Baccalaureate degree in music or permission of the department chair and instructor.

MUSC 604. Foundations of Music Education. 3 Credits.

This course involves the study of the philosophical, psychological and historical foundations of music related to curriculum development. Prerequisites: Baccalaureate degree in music or permission of the department chair and instructor.

MUSC 605. Literature of the Wind Ensemble. 3 Credits.

The course centers upon the study of the performance, review and analysis of music for the Symphonic Band and Wind Ensemble. Suited especially to the needs of directors of secondary school and other nonprofessional wind ensembles. Prerequisites: Baccalaureate degree in music or permission of the instructor.

MUSC 606. Choral Music Literature. 3 Credits.

Survey of choral literature and practical performance practices from the Renaissance to the present. Prerequisites: Baccalaureate degree in music or permission of the department chair and instructor.

MUSC 607. Orff Schulwerk Level I. 3 Credits.

This course is a study of basic Orff Schulwerk techniques. Level I pedagogy includes instruction in the use of pentatonic scale, ostinato, elemental forms, improvisation, basic body movement and basic soprano recorder skills. Prerequisites: undergraduate degree in music or music education.

MUSC 608. Orff Schulwerk Level II. 3 Credits.

Introduction of Alto recorder occurs in Level II. Also included is an in-depth study of Orff Schulwerk Vol. III in which the student will be instructed in the use of I, IV, V harmony. Body movement and extensive study of folk dance are included. Prerequisites: MUSC 607 and proficiency on the soprano recorder.

MUSC 609. Literature of the Orchestra. 3 Credits.

This course reviews repertoire selection criteria for elementary through high school, score analysis, and historical development of the orchestra. Suited especially for public school orchestra teachers. Prerequisites: undergraduate degree in music or permission of the instructor.

MUSC 610. Orff Schulwerk Level III. 3 Credits.

This course will build upon the skills and concepts introduced in Orff Schulwerk Levels I and II. Recorder technique will be expanded upon as well as eurhythmics and special topics. Prerequisites: MUSC 607 and MUSC 608.

MUSC 611. Current Trends in Elementary and Secondary Music. 3 Credits.

Designed for public school music teachers. This course involves the study of current methodology, its practice and uses in the elementary and secondary general/vocal/instrumental music program. Prerequisites: Baccalaureate degree in music or permission of the department chair and instructor.

MUSC 612. Organization and Administration of Instrumental Music. 3 Credits.

The course involves the study of effective organization and implementation techniques for elementary and secondary instrumental ensembles; includes particular problems in the administration of high school instrumental groups. Prerequisites: Baccalaureate degree in music or permission of instructor.

MUSC 613. Workshop in Music Education. 1 Credit.

This course centers upon the development of performance and instructional skills in various aspects of music education. May be repeated twice with different emphases. Prerequisites: Baccalaureate degree in music or permission of the department chair and instructor.

MUSC 614. Workshop in Instrumental Music. 1 Credit.

The course centers upon the development of performance and instrumental skills in various aspects of instrumental music. May be repeated twice with different emphases. Prerequisites: Baccalaureate degree in music or permission of the department chair and instructor.

MUSC 615. Workshop in Choral Music. 1 Credit.

This course centers upon the development of conducting techniques, performance and instructional skills in various aspects of choral music. May be repeated twice with different emphases. Prerequisites: Baccalaureate degree in music or permission of the department chair and instructor.

MUSC 616. Advanced Conducting Seminar. 3 Credits.

Involves conducting techniques as applied to various mixed ensembles. Emphasizes the technical considerations common to all phases of choral and instrumental conducting with special concern for school problems. Prerequisites: Baccalaureate degree in music or permission of instructor or department chair.

MUSC 623. Arranging for Instrumental Ensembles. 3 Credits.

A course focused upon the arranging of music for instrumental ensembles from trio, quartet, quintet, etc., to full band or orchestra. Techniques will be discussed in class and students will complete written assignments to implement these techniques. Final paper will be an arrangement for an ensemble of at least six parts. Prerequisites: passing the graduate theory placement test; undergraduate degree in music or permission of the instructor.

MUSC 630. Research in Music Education. 3 Credits.

Types of research, selection of problems, location of educational information, collection and classification of data, organization, presentation and interpretation of materials in the area of music education. Prerequisites: undergraduate degree in music or permission of the instructor. Pre- or corequisite: MUSC 600.

MUSC 635. The Use of Computers and Midi Technology in the Classroom. 3 Credits.

An in-depth survey of software available for use in the classroom, including sequencing, notation, and theoretical applications. A basic understanding of synthesizers and MIDI technology will be emphasized. The course will focus upon a hands-on approach to the subject matter, and extensive laboratory time in the EMS will be required. Prerequisites: undergraduate degree in music or permission of the instructor.

MUSC 636. Techniques of Jazz Education in the Secondary School. 3 Credits.

This course will deal with rehearsal techniques for the Jazz Ensemble, including articulation, style, phrasing, literature, and improvisational techniques. In addition, Jazz history and literature will be discussed in detail. Prerequisites: undergraduate degree in music or permission of the instructor.

MUSC 639. Vocal/Choral Arranging. 3 Credits.

Course is designed to develop the skills necessary to arrange a piece of vocal music for ensembles of various sizes and makeup. Techniques will be discussed and shown in class and students will complete written assignments to implement these techniques. Prerequisites: passing the Theory Placement Test; undergraduate degree in music or permission of the instructor.

MUSC 680. Performing Ensembles. 1 Credit.

Students are expected to help with sectional rehearsals and do in-depth score study on all music being performed. Prerequisites: permission of the instructor and audition.

MUSC 691. Tests and Measurement in Music Education. 3 Credits.

This course is designed to acquaint the student with tests and measurements used in the field of music education and the methods of designing and utilizing such tests. Prerequisites: Baccalaureate degree in music or permission of the department chair and instructor.

MUSC 695. Topics in Music. 1-3 Credits.

These courses will appear in the course schedule. Course descriptions and prerequisites for each course may be found in information distributed to all academic advisors. Prerequisites: undergraduate degree in music or permission of the instructor.

MUSC 696. Topics in Music. 1-3 Credits.

These courses will appear in the course schedule. Course descriptions and prerequisites for each course may be found in information distributed to all academic advisors. Prerequisites: undergraduate degree in music or permission of the instructor.

MUSC 697. Independent Study. 1-3 Credits.

Designed for individualized study. Independent study projects will be related to music education and done under the supervision of a certified faculty member. Prerequisites: permission of the graduate program director.

MUSC 698. Thesis Research. 3 Credits.

Prerequisites: MUSC 600, MUSC 630 and permission of the graduate program director. Application of research procedures in music education, culminating in student study of selected topics.

MUSC 699. Thesis. 3 Credits.

Prerequisites: MUSC 698. Completion of thesis for MME degree.

MUSC 998. MUSC 998. 1 Credit.

MUSC 999. Music 999. 1 Credit.

Course for continuation in the master's program for MME.

NMED - Nuclear Medicine Technology

NUCLEAR MEDICINE TECHNOLOGY Courses

NMED 695. Topics in Nuclear Medicing Technology. 1-3 Credits.

Special topic related to the field of nuclear medicine technology and molecular imaging.

NMED 697. Directed Study in Nuclear Medicine Technology. 1-3 Credits.

Directed study in a topic or area relevant to nuclear medicine or nuclear medicine technology.

NMED 698. Research. 3 Credits.

Research on a topic or project related to nuclear medicine or nuclear medicine technology.

NMED 699. Thesis. 3 Credits.

Thesis on a topic in nuclear medicine/molecular imaging or nuclear medicine technology.

NURA - Nurse Anesthesia

NURSE ANESTHESIA Courses

NURA 650. Medical Physical Sciences. 3 Credits.

Prepares the health care worker for a more advanced role on the health care team by providing an introduction to physics and biochemistry.

Prerequisites: admission to the program.

NURA 651. Pharmacology of Anesthesia Drugs. 4 Credits.

Prepares the R.N. for a role on the anesthesia patient care team and in the administration of anesthesia by teaching analysis, synthesis, and evaluation skills in selecting and discussing appropriate anesthesia drugs for utilization in patient care situations. Prerequisites: NURA 650.

NURA 652. Principles of Anesthesia Practice I. 4 Credits.

Prepares the R.N. for a role on the anesthesia patient care team and in the administration of anesthesia by teaching a basic level of expertise in understanding and using anesthesia equipment in a competent and safe manner. Prerequisites: NURA 650.

NURA 653. Principles of Anesthesia Practice II. 4 Credits.

Prerequisites: NURA 652. This is the second course in the series on basics of anesthesia practice. Prepares the R.N. for a role on the anesthesia patient care team and in the administration of anesthesia by teaching a basic level of cognitive, affective, and psychomotor expertise for the pre-operative, perioperative, and postoperative anesthesia periods.

NURA 654. Professional Aspects of Anesthesia. 3 Credits.

A study of the unique goals, difference means, distinctive content, and special problems of health/anesthesia care and education in this country. Includes such areas as management, organization, legal aspects, professional adjustments, ethics, psychology, and history. Prerequisites: admission to the program.

NURA 655. Principles of Anesthesia Practice III. 4 Credits.

Prerequisites: NURA 653. Continuation of role preparation in administration of anesthesia.

NURA 660. Pharmacotherapeutics for the Nurse Anesthetist. 3 Credits.

This course is designed to expand the graduate nurse anesthetist student's understanding of pharmacological principles including pharmacokinetics and pharmacodynamics in the advanced practice role of nurse anesthesia. Prerequisites: admission to the program.

NURA 695. Topics in Nurse Anesthesia. 1-6 Credits.

NURA 754. Anesthesia Practicum. 4 Credits.

Orientation to the operating room and anesthesia. Additional selected clinical experiences. Prerequisites: NURA 652.

NURA 755. Clinical Practicum A. 6 Credits.

Each course consists of orientation to the Operating Room and the Anesthesia Department. Provides actual administration of general and regional anesthesia with qualified clinical instructors (Anesthesiologists and/or CRNA's). Weekly classroom sessions consist of clinical conferences; journal club; and seminars dealing with current topics, including, but not necessarily limited to, respiratory, cardiovascular, thoracic, neuro, regional, obstetrical, pediatric, and special areas of anesthesia. Various special projects and competency examinations are administered throughout this phase. Prerequisites: admission to the program.

NURA 756. Clinical Practicum B. 10 Credits.

Each course consists of orientation to the Operating Room and the Anesthesia Department. Provides actual administration of general and regional anesthesia with qualified clinical instructors (Anesthesiologists and/or CRNA's). Weekly classroom sessions consist of clinical conferences; journal club; and seminars dealing with current topics, including, but not necessarily limited to, respiratory, cardiovascular, thoracic, neuro, regional, obstetrical, pediatric, and special areas of anesthesia. Various special projects and competency examinations are administered throughout this phase. Prerequisites: admission to the program.

NURA 757. Clinical Practicum C. 10 Credits.

Each course consists of orientation to the Operating Room and the Anesthesia Department. Provides actual administration of general and regional anesthesia with qualified clinical instructors (Anesthesiologists and/or CRNA's). Weekly classroom sessions consist of clinical conferences; journal club; and seminars dealing with current topics, including, but not necessarily limited to, respiratory, cardiovascular, thoracic, neuro, regional, obstetrical, pediatric, and special areas of anesthesia. Various special projects and competency examinations are administered throughout this phase. Prerequisites: admission to the program.

NURA 758. Clinical Practicum D. 10 Credits.

Each course consists of orientation to the Operating Room and the Anesthesia Department. Provides actual administration of general and regional anesthesia with qualified clinical instructors (Anesthesiologists and/or CRNA's). Weekly classroom sessions consist of clinical conferences; journal club; and seminars dealing with current topics, including, but not necessarily limited to, respiratory, cardiovascular, thoracic, neuro, regional, obstetrical, pediatric, and special areas of anesthesia. Various special projects and competency examinations are administered throughout this phase. Prerequisites: admission to the program.

NURA 759. Advanced CRNA Clinical Course. 12 Credits.

This advanced placement credit is awarded to the certified registered nurse anesthetist who has demonstrated knowledge of selected complex nursing concepts for the provision of anesthesia services. Prerequisites: B.S.N. degree with CRNA license.

NURS - Nursing

NURSING Courses

NURS 595. Topics in Nursing. 1-3 Credits.

The study of selected topics that may not be offered regularly. Special topics will appear in the schedule of classes each semester. Prerequisites: Permission of the instructor.

NURS 610. Theoretical Foundations for Nursing Practice. 3 Credits.

This course focuses on development of advanced knowledge of nursing and non-nursing models, concepts, and theories as the supporting framework for professional nursing practice and research. Emphasis is placed on both analysis and application of the models, concepts, and theories to various client populations and nursing practice settings. Students are expected to support conclusions regarding a theory's utility to practice through presentation of supportive research findings.

NURS 611. Research Design. 3 Credits.

This research course is designed to provide the MSN student with knowledge needed to critique research literature. Research design and methodology components are also presented.

NURS 613. Issues in Advanced Nursing Practice. 3 Credits.

This course focuses on political, ethical, societal, and professional issues in advanced nursing practice. The student examines current and emerging advanced practice roles including entrepreneurship. Prerequisites: NURS 610, NURS 611.

NURS 615. Ethical Concepts and Issues in Advanced Practice Nursing. 2 Credits.

This course is designed to provide students with core ethical knowledge necessary to describe and analyze ethical concepts foundational to the advanced practice nursing role. Students will develop and evaluate strategies, including ethical decision making frameworks, to address ethical dilemmas inherent in patient care, health organizations and research.

NURS 619. Advanced Nursing Practice IV. 6 Credits.

This clinical course provides an opportunity for concentrated clinical practice in the advanced nursing practice role. Prerequisites: NURS 674 and NURS 675.

NURS 620. Professional Relationships and Human Resources Management. 3 Credits.

This course focuses on the constructive use of power, influence and politics impacting nursing and the health care system. Theories of group dynamics, motivation and incentives will be used to underpin skill development in negotiation and conflict resolution. Prerequisites: admission to program or approval of instructor.

NURS 621. Aging in the 21st Century. 3 Credits.

This course explains the history of the specialty of geriatrics, the social impact, health maintenance goals and physical changes associated with aging. The role of interprofessional teams in meeting the needs of the aging population will be explored.

NURS 630. Nursing Curriculum Design and Program Evaluation. 3 Credits.

This course focuses on factors impacting the development of nursing curriculums including theory, professional practice trends, education standards, accreditation guidelines and institutional policy/procedure. Components of curriculums are evaluated, and strategies for program evaluation are explored.

NURS 632. Instructional Delivery Methods and Learner Assessment. 3 Credits.

This course describes models and methods for clinical instruction that facilitate learning, and explores clinical evaluation methods and instruments. Emphasis is on identifying ways to blend traditional teaching strategies with technology-based instruction in classroom and clinical settings. Pre- or corequisite: NURS 634.

NURS 634. Nurse Educator/Faculty Internship I Classroom Instruction. 2 Credits.

This internship course is designed to provide the student with experience facilitating classroom instruction in an entry level nursing program. Pre- or corequisite: NURS 632.

NURS 636. Instructional Delivery Methods in Nursing Education. 3 Credits.

The enhancement of nursing education through technology-based instruction utilizing a variety of resources and models is explored. Reports of best practices, research findings and learning-related theories to guide the development of media-supported instruction, skill acquisition in a simulated environment, and the creation and nurturing of learning communities in cyberspace are examined. Corequisite: NURS 634.

NURS 638. Adult-Gerontology Clinical Nurse Specialist I: Introduction to Practice. 2 Credits.

This course provides the MSN student with knowledge of core concepts that provide the foundation for Adult/Gerontology Clinical Nurse Specialist practice. Corequisite: NURS 639. Prerequisites: NURS 610, NURS 611, NURS 670, NURS 671, NURS 672, NURS 661.

NURS 639. Adult-Gerontology Clinical Nurse Specialist Practicum I: Role Socialization. 3 Credits.

This course is designed to acquaint the student with the role of the Adult-Gerontology Clinical Nurse Specialist in the practice environment. Prerequisites: NURS 610, NURS 611, NURS 661, NURS 670, NURS 671, and NURS 672. Pre- or corequisite: NURS 638.

NURS 642. Advanced Maternal Child Nursing II: Common Health Problems and Health Promotion of Children. 3 Credits.

This course provides knowledge and skills needed to promote and nurture the health of children from neonates to adolescents. The management of common health problems is also a focus.

NURS 644. Clinical Teaching Methods for the Nurse Educator. 2 Credits.

This course describes practice settings for nursing clinical instruction, identifies characteristics of effective clinical teachers, describes models and methods for clinical instruction that facilitate learning, and explores clinical evaluation methods and instruments. Corequisite: NURS 649. Prerequisites: NURS 634 and NURS 636.

NURS 645. Nursing Curriculum Design and Course Development. 3 Credits.

Factors that influence the development of entry-level nursing curricula are explored in relation to workforce trends and accreditation standards and guidelines. The importance of a philosophical and theoretical foundation for nursing education is highlighted in relation to the development of a curricular framework that identifies instructional competencies and outcomes to guide course design and determine course content and sequencing. Corequisite: NURS 649. Prerequisites: NURS 634 and NURS 636.

NURS 646. Structure and Function for Advanced Nursing Practice I. 3 Credits.

This course is designed to provide indepth knowledge of structure and function of the human body as the necessary basis for the advanced practice of nursing. The course emphasizes analysis and application of the structure and function of the nervous, endocrine, and excretory systems to advanced practice nursing. Prerequisites: admission to the program.

NURS 647. Structure and Function for Advanced Nursing Practice II. 3 Credits.

This course is designed to provide indepth knowledge of structure and function of the human body as the necessary basis for the advanced practice of nursing. The course emphasizes the analysis and application of the structure and function of the cardiovascular and respiratory systems to the advanced practice of nursing. Prerequisites: NURS 646.

NURS 648. Disease Processes for Advanced Practice. 3 Credits.

This course examines topics in selected disease processes. The course focuses on the significance of the disease for advanced nursing practice. Prerequisites: NURS 646 and NURS 647.

NURS 649. Nurse Educator/Faculty Internship II Clinical Instruction. 2 Credits.

This practicum course is designed to provide the student with field experience in clinical instruction. A nursing master teacher in an entry-level nursing education program mentors the student. Students consult with the role coordinator to select a site for the completion of this experience. Prerequisites: NURS 634 and NURS 636.

NURS 654. Assessment and Evaluation in Nursing Education. 3 Credits.

This course concentrates on strategies to measure and improve nursing student performance in the classroom, as well as enhance course and program effectiveness. Emphasis is on the selection of instruments, data collection methods and reporting procedures to guide assessment and evaluation processes that are appropriate for what is being examined. Corequisite: NURS 676. Prerequisites: NURS 634, NURS 636, NURS 644, NURS 645, and NURS 649.

NURS 656. Adult-Gerontology Clinical Nurse Specialist II: Transition to Practice. 2 Credits.

This course provides the MSN student with knowledge necessary for developing Adult-Gerontology Clinical Nurse Specialist practice and leadership skills. Corequisite: NURS 657. Prerequisites: NURS 610, NURS 611, NURS 670, NURS 671, NURS 672, NURS 661, NURS 638, NURS 639.

NURS 657. Adult-Gerontology Clinical Nurse Specialist Practicum II: Role Transition. 3 Credits.

This clinical course focuses on Adult-Gerontology Clinical Nurse Specialist practice. Concepts presented in the didactic component (NURS 656) will be actualized in the clinical setting. Pre- or corequisite: NURS 656.

NURS 658. Advanced Nursing Practice in Women's Health I. 2 Credits.

This course focuses on the development of advanced practice skills in the care of women. Prerequisites: NURS 661, NURS 670, NURS 671, NURS 672, and NURS 719.

NURS 659. Advanced Nursing Practice in Women's Health II. 3 Credits.

Prerequisites: NURS 610, NURS 611, NURS 658, NURS 661, NURS 663, NURS 664, NURS 670, NURS 671, NURS 672, NURS 719, and NURS 762. This course focuses on the development of advanced skills related to perinatal practice in the care of women.

NURS 660. Advanced Nursing Practice in Women's Health III. 6 Credits.

This course focuses on the integration of advanced practice skills in the care of women including health promotion, illness management, reproductive needs, and lifespan care. Corequisite: NURS 686. Prerequisites: NURS 658, NURS 659, NURS 661, NURS 663, NURS 664, NURS 670, NURS 671, NURS 672, NURS 719, NURS 762, and NURS 787.

NURS 661. Pharmacotherapeutics for Primary Health Care Providers. 3 Credits.

This course is designed to expand the graduate nurse practitioner or clinical nurse specialist student's understanding of pharmacological principles, including pharmacokinetics and pharmacodynamics.

NURS 663. Health Promotion and Maintenance. 2 Credits.

This course provides the nurse practitioner student the opportunity to work with students from other professions as they develop health promotion strategies that consider the expertise of each discipline. Students will incorporate technology in promoting health.

NURS 664. Primary Care for Women. 3 Credits.

This course will explore current clinical concepts related to the care of healthy and pregnant women. Roles and responsibilities of the family nurse practitioner in these subspecialties will be discussed. Corequisite: NURS 663. Prerequisites: NURS 661, NURS 670, NURS 671, NURS 672, and NURS 719.

NURS 665. Advanced Family Nursing I Practicum. 2 Credits.

This course provides the opportunity to practice clinical decision making and primary care assessment skills within a primary care setting. Collaborative strategies will be emphasized in the position of health promotion/maintenance strategies and the management of common health problems. Prerequisites: NURS 661, NURS 670, NURS 671, NURS 672, and NURS 719.

NURS 670. Advanced Pathophysiology. 3 Credits.

This course explains the pathophysiology of disease as a basis for advanced practice and assessment for prevention and management of health conditions.

NURS 671. Advanced Physical Assessment. 1 Credit.

Emphasis is on advanced history taking, physical assessment and interviewing skills for advanced practice nursing. Pre- or corequisite: NURS 672.

NURS 672. Advanced Physical Assessment Laboratory. 1 Credit.

This laboratory course provides the advanced practice student a hands-on opportunity to practice physical assessment skills needed by nurse practitioners. Pre- or corequisites: NURS 671.

NURS 674. Advanced Maternal Child Nursing Practice II. 2 Credits.

Continued advanced practice nursing in the care of children and their families. Prerequisites: NURS 661, NURS 670, NURS 671, NURS 672.

NURS 675. Advanced Maternal Child Nursing Practice III. 2 Credits.

Capstone clinical course in advanced practice nursing in the care of children and their families. Corequisite: NURS 724. Prerequisites: NURS 674.

NURS 676. Professional, Ethical and Legal Concepts of Nursing Education. 3 Credits.

This course is designed to prepare students for the role of educator in higher education environments. Emphasis is on the identification of functions, rights, and responsibilities of nursing faculty in relation to students, colleagues, administrators, the institution, community, and profession. Corequisite: NURS 654. Prerequisites: NURS 634, NURS 636, NURS 644, NURS 645 and NURS 649.

NURS 686. Synthesis of Advanced Practice Concepts in Adolescent Focus. 3 Credits.

This capstone course focuses on the synthesis of advanced practice concepts in the care of adolescent females. Content includes successful models of care and models of collaborative practice in pediatrics. Prerequisites: NURS 661.

NURS 690. M.S.N. Comprehensive Examination. 0 Credits.

The Master of Science in Nursing comprehensive examination offers the student an opportunity to synthesize the learning experiences of the graduate program and demonstrate mastery of program outcomes in critical thinking, advocacy, leadership, advance practice, and education. The student must receive a grade of pass on the comprehensive examination to successfully complete the M.S.N. degree.

NURS 695. SU Nursing. 6 Credits.

Selected courses taken at Shenandoah University in fulfillment of Midwifery program requirements. Course title offerings as Primary Care of Women or Comprehensive Antepartal Care.

NURS 697. Topics: Independent Study. 1-3 Credits.

Independent Study.

NURS 698. Independent Clinical Study. 1-3 Credits.

This course focuses on clinical and/or research-related competencies of graduate nursing students. Students enroll on an as-needed basis as determined by the instructor or student. Prerequisites: enrollment in the graduate nursing program and permission of the instructor.

NURS 699. Thesis/Research Project. 1-3 Credits.

Thesis/research project completion. Variable credit to be determined by research advisor. May be repeated as needed. Prerequisites: NURS 611, NURS 640.

NURS 703. Adult-Gerontology Clinical Nurse Specialist Practicum III: Role Synthesis. 3 Credits.

This capstone course focuses on synthesis and application of key concepts related to Adult-Gerontology Clinical Nurse Specialist and Educator practice. Prerequisites: NURS 610, NURS 611, NURS 670, NURS 671, NURS 672, NURS 661, NURS 638, NURS 639, NURS 656, and NURS 657.

NURS 705. Primary Care Approaches for Children. 3 Credits.

This course for the family nurse practitioner focuses upon primary health care problems in the pediatric population. Emphasis is placed upon assessment and management of healthy and ill children. Corequisite: NURS 764. Prerequisites: NURS 661, NURS 663, NURS 664, NURS 665, NURS 670, NURS 671, NURS 672, and NURS 762.

NURS 707. Informatics and Healthcare Technology. 3 Credits.

This course will cover the use of data in health care as well as other informatics applications. Students will explore healthcare technology used to improve the delivery and evaluation of care.

NURS 709. Evidence-Based Research and Theories for Nursing Practice. 3 Credits.

This course focuses on the development of advanced nursing knowledge related to the utilization of evidence-based research for best practice. The focus is on understanding nursing and non-nursing models, concepts, and theories as the supporting framework for professional nursing practice and research. Emphasis is placed on the evaluation and application of research and evidence for use in advanced practice.

NURS 710. Leadership in Complex Systems and Organizations. 3 Credits.

This course will focus on the leadership that comprises two types: informal and formal leadership. Competencies will include communication knowledge of health care environment, leadership, professionalism, and business skills. Prerequisites: Instructor approval required.

NURS 712. Evidence based Management for Quality Healthcare. 3 Credits.

This course focuses on the development of systems focus processes to ensure quality health care. The evidence based model is applied to organizational systems. Prerequisite: Instructor approval required.

NURS 714. Competitive Resource Design and Utilization. 3 Credits.

This course focuses on the competitive design and utilization of organizational and human resources. Emphasis is placed on the strategic process to ensure that resources are applied in ways to ensure high quality care and excellent patient outcomes. The course will cover the business models for effective financial and personnel management of healthcare organizations. Analysis of the costs and quality of care will be performed. (Cross-listed with NURS 814.).

NURS 716. Organizational Leadership Practicum. 3 Credits.

This practicum provides opportunities for advanced nursing practice in a variety of settings and with diverse clients. In addition, students examine issues related to the advanced practice role in a chosen focus area. The course is designed to provide students with experience in application of theories and assessment tools explored in Organizational Leadership. Corequisite: NURS 735.

NURS 717. Strategic Leadership Practicum. 3 Credits.

This practicum course emphasizes the advanced practice nurse's role in strategic planning and program development. Students enrolled in this advanced practice course will participate in clinical practice experiences in a chosen focus area. This course is designed to provide students with experiences in applying the knowledge acquired in Strategic Leadership. Corequisite: NURS 740.

NURS 718. Practicum Immersion for Novice Nurse Executives. 3 Credits.

This practicum course serves as a bridge between the roles of nurse administrators and nurse executives. Targeted practicum experiences will enable the nurse administrator to examine the role of the nurse executive related to implementation of change, meeting strategic initiatives, program evaluation, and outcome management in a chosen focus area. Application of futuristic and visionary theory to health care system trends is explored to provide optimal strategic positioning in the future healthcare market. Prerequisites: NURS 716, NURS 717 or permission of the instructor.

NURS 719. Family and Community Primary Care Assessment. 1 Credit.

Focus is on assessing psycho-social problems in primary care setting. Student will develop skills in assessing the most common psychiatric disorders, substance abuse and disruptive behavior disorders. Assessment of the patient in the context of the family will be stressed. Prerequisites: admission to the FNP, WHNP or Postmaster's FNP and WHNP program.

NURS 724. Management of Chronic Problems and Illnesses. 3 Credits.

The focus on this course is on the management of chronic and acute illness in children.

NURS 732. Health Care Populations, Diversity and Outcomes. 3 Credits.

This course examines current topics and issues related to health disparities in underserved populations. Students will examine intervention and policy research using an interdisciplinary perspective as well as the structural, financial and personal barriers to optimal health outcomes.

NURS 735. Organizational and Management Theory. 3 Credits.

This course provides a theoretical foundation focusing on leadership theory and assessment strategies for use in the health care systems. Theories on leadership, organizations, policy, administration, and change will be applied to current health care system issues. Assessment tools for applications of theories will be utilized. Principles of organizational behavior and human resource management will be explored in the context of health care system needs.

NURS 740. Strategic Leadership. 3 Credits.

Principles of organizational strategy and program development are the major components for this course. Relevant theories associated with organizational development, setting program strategic initiatives, strategic planning, and organizational level analysis and evaluation will be explored. Prerequisites: admission to program, NURS 735, or approval of instructor.

NURS 745. Visionary Leadership. 3 Credits.

The final course in the leadership series provides the opportunity to examine outcomes at the program and health care system level and project future health care system needs. The focus is on activities necessary for effective evaluation of health care programs and meeting strategic initiatives by successfully implementing change. Capability for envisioning profound changes within the health care system will be developed. Transformation/Futuristic theory will be applied to envision market change for health care systems to be strategically positioned for future trends. Prerequisites: NURS 735, NURS 740, admission to program or approval of instructor.

NURS 762. Advanced Family Nursing I: Management of Acute Illnesses. 3 Credits.

Focus is on acute health problems in the primary care setting, including assessment and management. Inclusion of geriatric content relating to acute illnesses will be added. Prerequisites: NURS 661, NURS 670, NURS 671, NURS 672, and NURS 719.

NURS 764. Advanced Family Nursing II Practicum. 4 Credits.

The purpose of this clinical course is to prepare the family nurse practitioner student to deliver primary care services to families in which a patient has either acute, women's health or pediatric care disorders. Corequisite: NURS 705. Prerequisites: NURS 661, NURS 663, NURS 664, NURS 665, NURS 670, NURS 671, NURS 672, NURS 719, and NURS 762.

NURS 765. Advanced Family Nursing II: Management of Chronic Illnesses. 3 Credits.

The focus of this course is on the accurate diagnosis and management of chronic health problems within the primary care setting for the family nurse practitioner (FNP). Prerequisites: NURS 661, NURS 663, NURS 664, NURS 665, NURS 661, NURS 670, NURS 671, NURS 672, NURS 705, NURS 719, NURS 762, and NURS 764. Pre- or corequisite: NURS 765 and NURS 768.

NURS 767. Advanced Family Nursing III Practicum. 5 Credits.

This clinical emphasizes integration of primary care skills and clinical course decision-making in populations with acute chronic, complex, pediatric or women's health disorders for family nurse practitioner students. Prerequisites: NURS 661, NURS 663, NURS 664, NURS 665, NURS 670, NURS 671, NURS 672, NURS 705, NURS 719, NURS 762, and NURS 764.

NURS 768. Nursing Seminar in Complex Health Problems. 1 Credit.

The focus of this seminar course is to explore clinical topics with an emphasis on the integration of primary care skills in advanced nursing practice. Prerequisites: NURS 613, NURS 705, and NURS 764.

NURS 780. Financial Issues in Nursing Administration. 3 Credits.

This course focuses on planning, designing, and monitoring of a nursing budget with special emphasis on personnel, supply, and capital equipment budgeting. Specific financial problems of a nursing service department are addressed. Prerequisites: NURS 616 and NURS 735.

NURS 787. Advanced Perinatal Nursing. 3 Credits.

This course focuses on the advanced nursing management of perinatal health for high-risk women. Prerequisites: NURS 658, NURS 661, NURS 663, NURS 664, NURS 670, NURS 671, NURS 672, NURS 719, and NURS 762.

NURS 795. Topics. 1-3 Credits.

Designed to provide the advanced student with an opportunity to investigate specific topics of current interest in the health services. Prerequisites: Ph.D. standing or permission of the instructor.

NURS 800. DNP I: Introduction to Healthcare Disparities, Vulnerable Populations, and Epidemiology. 2 Credits.

This course focuses on four DNP integrative concepts including leadership, advocacy, practice, and translational research. Issues related to planning and providing care related to disparity and issues for vulnerable and underserved populations will be highlighted. The role of epidemiology will be explored.

NURS 801. DNP II: Roles and Responsibilities for Transforming Practice. 3 Credits.

This course focuses on role expectations for doctorally prepared advanced practice nurses; the intersection of models of leadership, advocacy, practice and translational research will be emphasized. Personal strategic planning of the students will be addressed as it applies to disparity issues and vulnerable and underserved populations.

NURS 802. The Business of Advanced Nursing Practice. 3 Credits.

This course will explore the business dimensions of practice including legal, safety, quality and financial. The course will focus on SWOT analysis, developing business plans and community assessments.

NURS 803. Leadership and Interprofessional Practice in Healthcare. 3 Credits.

This is an interprofessional course that explores organizational and structural opportunities and barriers within healthcare organizations through interprofessional collaboration and teamwork. Ethical issues will be explored. The focus is on the role of the healthcare provider as a leader of their profession within healthcare and on healthcare teams. Emphasis is on meeting the needs of underserved populations.

NURS 805. Application of Practice-Based Research Methods. 2 Credits.

This course focuses on the research process used to conduct practice-based research. It prepares advanced practice nurses to develop, implement, and evaluate programs that focus on improving healthcare outcomes.

NURS 806. Proposal Development and Database Management. 4 Credits.

This research course is designed to provide the Advanced Practice Nurse and Nurse Executive student with knowledge and skills regarding the design and methodology used to conduct a practice focused research study. Focus will be on human subjects protection, statistical analysis and database management. Prerequisites: NURS 805.

NURS 807. Informatics and Healthcare Technology. 3 Credits.

This course will cover the use of data in health care as well as other informatics applications. Students will explore healthcare technology used to improve the delivery and evaluation of care.

NURS 809. Advocacy for Healthcare Public Policy for Advanced Practice. 3 Credits.

This course will prepare the DNP to assume a leadership role in developing, implementing, and advocating for health care policy that results in quality, accessible, comprehensive health care for vulnerable populations.

NURS 810. Leadership in Complex Systems and Organizations. 3 Credits.

This course will focus on the leadership that comprises two types: informal and formal leadership. Competencies will include communication, knowledge of health care environment, leadership, professionalism, and business skills.

NURS 812. Evidence-Based Management for Quality Healthcare. 3 Credits.

This course focuses on the development of system focused processes to ensure quality healthcare. The evidenced based model is applied to organizational systems. Emphasis is placed on creative and innovative solutions to quality care issues.

NURS 814. Competitive Resource Design and Utilization. 3 Credits.

This course focuses on the competitive design and utilization of organizational and human resources. Emphasis is placed on the strategic process to ensure that resources are applied in ways to ensure high quality care and excellent patient outcomes. The course will cover the business models for effective financial and personnel management of healthcare organizations. Analysis of the costs of care and quality of care will be performed.

NURS 816. DNP Executive Practicum I. 2-3 Credits.

This practicum focuses on the application of nurse executive leadership skills in the practice environment. Focus will be on the role of the nurse executive and evidence-based research. Corequisite: NURS 805.

NURS 817. DNP Executive Practicum II. 2-5 Credits.

This experience focuses on the application of executive leadership skills in nursing. Focus will be on the role of the nurse executive and evidence-based research. Corequisite: NURS 806.

NURS 818. DNP Executive Practicum III. 3-5 Credits.

This practicum focuses on the application of executive leadership skills in the practice environment. Focus will be on the role of the nurse executive, evidence-based research and the use of healthcare technology. Corequisite: NURS 807.

NURS 819. DNP Executive Practicum IV. 3-5 Credits.

This practicum focuses on the application of executive leadership skills in the practice environment. Focus will be on the role of the nurse executive, evidence-based research, and practice dissemination. Corequisite: NURS 890.

NURS 865. DNP Clinical Practicum I. 2 Credits.

This course is designed to provide the Advanced Practice Nurse with the knowledge and skills to practice at an advanced level in a practice-based setting. Focus will be on enhanced clinical skills and evidence-based research. Corequisite: NURS 805.

NURS 866. DNP Clinical Practicum II. 2 Credits.

This course is designed to provide the Advanced Practice Nurse with the knowledge and skills to practice at an advanced level in a practice-based setting. Focus will be on evidence-based practice, teamwork, evidence-based research, and advanced clinical diagnostics. Corequisite: NURS 806.

NURS 867. DNP Clinical Practicum III. 3 Credits.

This course is designed to provide the Advanced Practice Nurse with the knowledge and skills to practice as an expert clinician, a program evaluator, and a team leader within a practice-based setting focusing on evidence-based practice. Healthcare technology will be explored.

NURS 868. DNP Clinical Practicum IV. 3 Credits.

This course is designed to provide the Advanced Practice Nurse with the knowledge and skills to practice as an expert clinician, a program evaluator, a team leader, and a change agent with emphasis on translational and evidence-based research. Corequisite: NURS 890.

NURS 890. DNP Nursing Capstone. 3 Credits.

This research course is designed to facilitate the ability of the Advanced Practice Nurse to synthesize, translate into practice, and disseminate practice focused research findings and apply findings to practice settings. Corequisite: NURS 868.

NURS 895. Topics. 1-3 Credits.

Designed to provide the advanced doctoral student with an opportunity to investigate specific topics of current interest in the health services. Prerequisites: DNP standing or permission of the instructor.

OEAS - Ocean, Earth and Atmospheric Sciences

OCEAN, EARTH AND ATMOSPHERIC SCIENCES Courses

OEAS 502. Field Experiences in Oceanography for Teachers. 3 Credits.

Lecture 2 hours; field experience 2 hours; 3 credits. Prerequisite: background in K-12 Education. Field and laboratory experiences in oceanography including hands-on experience using equipment and methods suitable for middle and secondary education professionals. Course will provide understanding of oceanic processes using simple field and laboratory experiments. Not available for credit for OEAS majors and minors.

OEAS 503. Aquatic Pollution. 3 Credits.

Lecture 3 hours; 3 credits. This course will present basic ecological principles relevant to water pollution and toxicology. Topics will cover runoff, eutrophication, sewage treatment, industrial waste, oil pollution, pesticides, and plastics in the sea. Case studies provide focal points for consideration of issues in making decisions and setting policy. (This is a writing intensive course.)

OEAS 504. Environmental Physiology of Marine Animals. 3 Credits.

Lecture 3 hours; 3 credits. Functional morphology and physiological aspects of growth and ecological energetics of marine animals. Basic concepts and habitat comparisons.

OEAS 505. Physical Oceanography. 3 Credits.

Physics of the ocean: properties of seawater and their distribution; water mass formation; mass and energy flows; waves; tides; models; estuarine and coastal processes. An elective for science and engineering majors. Prerequisites: C or better in MATH 211 and either PHYS 232N or two semesters of hydraulics.

OEAS 506. Matlab. 1 Credit.

This course is designed to introduce students to Matlab programming and to develop skills utilizing this program for data analysis. Prerequisite: C or better in MATH 211 or permission of instructor.

OEAS 508. Introductory Soils. 4 Credits.

Lecture 3 hours; laboratory 2 hours; 4 credits. Nature and properties of soils. Physical and chemical processes in soils and their influence on plant growth, the movement of water, and pollutants. Importance of soil properties in determining urban, industrial and agricultural uses.

OEAS 510. Chemical Oceanography. 4 Credits.

Lecture 3 hours; laboratory 3 hours; 4 credits. Chemical composition of the ocean and the chemical, biological, geological and physical processes controlling it. Laboratory experiments include determination of salinity, oxygen, and nutrients, and a field sampling trip is undertaken.

OEAS 511. Structural Geology. 4 Credits.

Lecture 3 hours; laboratory 2 hours; 4 credits. Recognition, habitat, and origin of deformed geologic structures. Relationships between structural patterns and tectonic settings. Laboratory sessions emphasize cartographic and stereographic projections, map interpretation, and hand sample evaluation. Weekend field trip required.

OEAS 512. Global Environmental Change. 3 Credits.

Lecture 3 hours; 3 credits. An examination of the development of the earth as a habitable planet, from its origin to human impacts on global biogeochemical cycles on land, and in the oceans and atmosphere.

OEAS 513. Environmental Geochemistry. 3 Credits.

Low temperature geochemistry of surface and near-surface materials and processes. Weathering and the geochemical cycle as influenced by environment.

OEAS 515. Waves and Tides. 3 Credits.

Causes, nature, measurement and analysis of water waves and tides. Mathematical and graphical application to wave and tide problems. Prerequisites: C or better in MATH 212 and PHYS 232N or permission of the instructor.

OEAS 516. Electronics and Oceanographic Instrumentation. 4 Credits.

Lecture/Lab, 3 hours. 4 credits. The course will consist of brief lectures and hands-on laboratory exercises, in which students will learn to build, use, and debug electronic devices relevant to ocean and earth science applications. Topics covered will include circuit theory, power supplies and budgets, transducers and amplifiers, computerized data acquisition, instrument control, signal conditioning and resolution.

OEAS 518. Chemical Limnology. 3 Credits.

Lecture 3 hours; 3 credits. Chemical cycling in lakes and reservoirs, and interactions with biological and physical processes; quantitative modeling of lake geochemistry.

OEAS 519. Spatial Analysis of Coastal Environments. 3 Credits.

Lecture 1.5 hours; laboratory 3 hours; 3 credits. Prerequisite: GEOG 504. The course integrates remotely sensed and field techniques for scientific investigation and practical management of coastal environmental systems. Spatial modeling of coastal processes and management tools using geographic information system (GIS).

OEAS 520. Hydrogeology. 3 Credits.

Lecture 2 hours; laboratory 2 hours; 3 credits. Topics covered will include the occurrence and movement of surface and subsurface water, the nature and distribution of permeable rocks and strata, field techniques used in ground-water studies, and the flow of ground-water to wells.

OEAS 526. Concepts in Oceanography for Teachers. 3 Credits.

3 credits. This web-based course will provide a practical introduction to oceanography for earth science teachers. It is particularly aimed at current science teachers attempting to become certified in earth science education. Topics will include discussions of geological, biological, physical and chemical oceanography. Not available for credit for OEAS majors and minors.

OEAS 530. Introduction to Geophysics. 3 Credits.

Lecture 3 hours; 3 credits. Introduction to the physics of the earth, including plate tectonics, volcanism, earthquakes and seismology, gravity, the earth's magnetic field, geophysical remote sensing, and mantle convection.

OEAS 531. Sedimentary Petrology. 3 Credits.

Lecture 2 hours; laboratory 3 hours; 3 credits. The chemical aspects of sediments and sedimentary rock needed for modern geologic and oceanographic studies. Optical petrology and x-ray diffraction are emphasized in the laboratory with particular attention to clay mineralogy. Field trip required.

OEAS 540. Biological Oceanography. 4 Credits.

Lecture 3 hours; laboratory 2 hours; 4 credits. Marine organisms and their relationship to physical and chemical processes in the ocean. Laboratory study of local marine organisms, marine ecosystem and sampling techniques. Includes identification, data analysis and field trips.

OEAS 546. Quaternary Geology. 3 Credits.

Lecture 3 hours; 3 credits. Geological effects of Cenozoic climate changes and tectonic movements on marine and terrestrial systems. Weekend field trips to study landscapes and deposits in the coastal plain and Appalachian provinces.

OEAS 548. Population Ecology. 3 Credits.

Lecture 3 hours; 3 credits. This course uses conceptual and mathematical models to understand how populations grow and persist in space and time. Both plants and animals are discussed.

OEAS 551. Data Collection and Analysis in Oceanography. 3 Credits.

Introduces basic physical oceanographic tools used to obtain and analyze information. Students will use various oceanographic instruments to obtain data at different locations in Chesapeake Bay. Data obtained with those instruments will be processed and analyzed using data analysis techniques discussed in class. The data will then be used to answer a particular question related to the temporal and spatial variability in a natural system.

OEAS 555. Introduction to Geomicrobiology. 3 Credits.

Lecture 3 hours; 3 credits. This course explores microorganisms in marine environments and their role in the fossil record. Students will examine bacteria and protista and investigate Earth's history during the Precambrian. One field trip.

OEAS 595. Special Topics. 1-4 Credits.

Lectures, field and laboratory studies; 1-4 credits each semester. Prerequisites: permission of the instructor. An investigation of a selected problem in physical, geological, chemical, or biological oceanography.

OEAS 603. Geobiology and Biosedimentology. 3 Credits.

Lecture 3 hours; 3 credits. Geobiology and biosedimentology reflect the interdisciplinary approach to environmental problems, questions related to Earth history, and the exploration of extraterrestrial worlds. The course elaborates our understanding of geobiology and biosedimentology by conducting a study on benthic cyanobacteria and their influences on sedimentary processes in marine environments. Study area is Fisherman's Island, located close to Norfolk, VA. The course includes aspects of astrobiology (the "sister of geobiology"), and discusses the evolution of life on Earth.

OEAS 604. Introduction to Physical Oceanography. 3 Credits.

Lecture 3 hours; 3 credits. Introduction to descriptive and dynamical physical oceanography. Properties of sea water; distribution of temperature, salinity and density; water, salt, and heat budgets; techniques for describing the ocean; circulation and water masses of the world's oceans and coastal waters.

OEAS 605. Introduction to Ocean Modeling and Prediction. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: OEAS 505 or OEAS 604. Instructor approval required. Introduction to concepts and theories of numerical ocean models and their applications in physical oceanography, computational fluid dynamics, environmental problems and ocean forecast systems.

OEAS 606. Experimental Procedures in Physical Oceanography. 3 Credits.

Lecture 3 hours; 3 credits. Provides basic knowledge for conducting field experiments in physical oceanography. Fundamentals of experimental design and sampling theory. Standard methods of data reduction, analysis, and reporting.

OEAS 610. Advanced Chemical Oceanography. 3 Credits.

Lecture 3 hours; 3 credits. Chemical properties of seawater; chemical composition of the ocean including major and trace elements, dissolved gases, micronutrient elements, and organic compounds; processes controlling this composition.

OEAS 611. Chemical Oceanography Laboratory. 3 Credits.

Laboratory 6 hours; 3 credits. Basic analytical chemistry of seawater; field work in chemical oceanography.

OEAS 612. Marine Geochemistry. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: OEAS 610. Processes governing the chemical composition of the ocean. Riverine input; air-sea exchange; sediment-bottom water exchange; hydrothermal input; internal cycling by physical processes; numerical modeling in chemical oceanography.

OEAS 613. Geochemistry of Marine Sediments. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisites: OEAS 610, 612. An introduction to the geochemistry of marine sediments, with an emphasis on nutrient (C,N,P,S) and trace element cycling in marine sediments.

OEAS 614. Chemical Oceanography in the Coastal Environment. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: OEAS 610. Chemical dynamics within water and sediments of estuaries, salt marshes, and the continental shelf; river-sea, air-sea, and sediment-water interactions; modeling techniques.

OEAS 616. Advanced Chemical Oceanography Laboratory. 3 Credits.

Lecture 1 hour; laboratory 6 hours; 3 credits. Prerequisite: OEAS 611. Analysis of trace constituents in marine waters, sediments, and sediment porewaters; sampling techniques; field experience.

OEAS 620. Advanced Geological Sciences. 3 Credits.

Lecture 3 hours; 3 credits. Survey of marine and terrestrial geology and geophysics; plate tectonics and basin formation; marine sediments and sediment dynamics; marine depositional environments and depositional systems; marine stratigraphy dynamics and the formation of marine basins.

OEAS 622. Wetland Hydrology. 3 Credits.

Lecture 2 hours; laboratory 3 hours; 3 credits. Hydrologic criteria used to delineate wetlands. Techniques used to calculate components of water budgets for non-tidal wetlands. Many lab exercises will require extensive field work in wetlands.

OEAS 625. Marine Sedimentary Environments. 3 Credits.

Attributes of marine sediments; main sedimentary facies zones in marine and coastal environments (deep sea, shelf, tidal flats, lagoons, barrier islands); modern depositional systems versus ancient depositional systems; reefs (brachiopoda, corals, sponges, foraminifers, etc); traces and trace fossils. Prerequisites: OEAS 620.

OEAS 630. Dynamical Oceanography I. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisites: OEAS 604 and MATH 691. Dynamics of rotating, stratified fluids, geostrophic adjustment, potential vorticity, Ekman layers, gravity waves, and large scale ocean circulation.

OEAS 634. Applied Clay Mineralogy. 3 Credits.

Lecture 3 hours; 3 credits. The study of clay minerals and colloids and the application of their physical and chemical properties to various geologic, agricultural, and environmental problems. Special emphasis is given to ion exchange and sorption problems involving clays under various conditions. Techniques of semiquantitative analysis of clay minerals and the alteration of their chemical physical properties are emphasized.

OEAS 640. Advanced Biological Oceanography. 4 Credits.

Marine organisms and their interactions with the physical and chemical environments of the sea; primary production, population ecology, nutrition, reproduction, and marine biogeography; related laboratory exercises.

OEAS 644. Environmental Physiology of Marine Animals. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: OEAS 640 or equivalent. Physiological and biochemical adaptations of marine animals in stable and changing environments. Topics include foraging, respiration growth and reproductive strategies in diverse marine habitats.

OEAS 651. Introduction to Physics of Estuaries. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: OEAS 604. This course considers the physical oceanography of estuaries. In particular, it explores how circulation and mixing in estuaries are influenced by atmospheric forcing, tidal forcing, coastal influences and bathymetric variability. Topics to be treated include classification of estuaries, typical steady dynamical balances, transport of salt and other quantities, mixing, and time-space scales of variability.

OEAS 667. Cooperative Education. 1-3 Credits.

1-3 credits (may be repeated for credit). Prerequisite: approval by the department and Career Management in accordance with the policy for granting credit for Cooperative Education programs. Available for pass/fail grading only. Student participation for credit based on the academic relevance of the work experience, criteria, and evaluative procedures as formally determined by the department and Career Management prior to the semester in which the work experience is to take place.

OEAS 669. Internship in Oceanography. 1-3 Credits.

1-3 credits. Prerequisite: permission of the department.

OEAS 690. Topics in Marine Environmental Policy. 3 Credits.

Lecture 3 hours; 3 credits. This course will give students a working understanding of how science policy decisions are made by governments and how science and technology impact public policy. This course seeks to integrate current policy/legislative initiatives with the underlying scientific issues in order to raise the student's appreciation for and understanding of the various influences that affect the decision-making process. In particular, the course will look at how science influences policy and assess the "state of the science" relative to the issues at stake.

OEAS 691. Seminar. 1 Credit.

1 credit. Techniques for presenting scientific data at professional meetings and seminars. Practical experience and feedback.

OEAS 695. Special Topics in Oceanography. 1-3 Credits.

1-3 credits each semester. An advanced investigation in a selected problem in physical, geological, chemical, or biological oceanography under the direction of the faculty of the Department of Ocean, Earth and Atmospheric Sciences.

OEAS 696. Selected Topics. 1-3 Credits.

1-3 credits. Prerequisite: permission of the instructor.

OEAS 698. Research. 1-9 Credits.

Any semester; hours to be arranged; variable credit. 1-9 credits per semester. M.S.-level research.

OEAS 699. Thesis. 1-9 Credits.

Any semester; hours to be arranged; variable credit. 1-9 credits per semester. M.S.-level work primarily devoted to the writing of the thesis.

OEAS 703. Stability of Ocean Flow. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisites: calculus, differential equations, geo-physical fluid dynamics. A study of the basic ideas and methods used to examine the stability of ocean currents. Topics include fundamentals, barotropic and baroclinic instability, wave packets and energy balance.

OEAS 704. Time Series in Oceanography. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: calculus. A study of the basic techniques used to model and analyze time series of oceanographic data. These include temporal spatial and frequency/wave number domain techniques.

OEAS 708. Simulation Techniques for Ocean Circulation. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisites: OEAS 730, and knowledge of a computer program language (FORTRAN preferred). Emphasis is on the construction of working ocean models, both vorticity-stream function and primitive equation models analyzed, mostly finite difference techniques, implicit and explicit schemes, staggered grids, discussion of ocean general circulation models.

OEAS 711. Regional Oceanography. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: OEAS 604. The regional oceanography of the major ocean basins, marginal seas, and coastal oceans. Seasonal and interannual variability. Heat and salt cycles.

OEAS 723. Ocean Turbulence and Mixing Processes. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisites: OEAS 730/830. This course will first provide a broad background in the concepts, theories and semi-analytical techniques used to describe turbulent motions and their effects in fluids. The various observational techniques that are presently used to measure turbulence in the ocean will be explored.

OEAS 730. Dynamical Oceanography II. 3 Credits.

Lecture 3 hours; 3 credits. Dynamics of rotating stratified fluids. Inertial waves, equatorial dynamics, coastal dynamics, dynamic instability.

OEAS 732. Advanced Geochemistry of Marine Sediments. 3 Credits.

Lecture 3 hours; 3 credits. Advanced topics in the geochemistry of marine sediments, with an emphasis on mathematical modeling of sedimentary geochemical processes.

OEAS 733. Marine Microbiology. 3 Credits.

Lecture, 3 hours. 3 credits. The course covers the distribution, abundance, and biogeochemical activities of microorganisms in the oceans, with emphasis on prokaryotic microbes and viruses. Symbioses with higher organisms, and applied aspects of marine microbiology, including biofouling and corrosion, invasive species, and marine biotechnology are also addressed.

OEAS 735. Paleoclimatology. 3 Credits.

Lecture 3 hours; 3 credits. This course focuses on the causes (forcings) of climate change; natural response time of the climate system; interactions and feedbacks; and the geologic record in climate change.

OEAS 741. Fisheries Management. 4 Credits.

Lecture 4 hours; 4 credits. An introduction to the major questions in the management of marine fisheries: abundance, estimation, distribution, recruitment and optimum yield. Topics are presented within the context of fisheries management, marine productivity and population ecology, all of which shape the direction of the primary literature.

OEAS 743. Applied Methods of Fisheries. 4 Credits.

Lecture 2 hours; laboratory 4 hours; 4 credits. Prerequisite: OEAS 744/844. Practice, principles and theory of applied methods in fisheries. Sampling and data collection tools, practice, and theory. Principles and theory of age determination, estimation of abundance, reproductive biology, marking and tagging, and mark-recapture. Special topics as necessary.

OEAS 744. Fisheries Management. 3 Credits.

Lecture 3 hours; 3 credits. Quantitative methods for the description and management of fisheries. Analytical and empirical forecasting models used to study case histories of managed fish stocks. Case studies of poorly and well managed stocks.

OEAS 747. Reproduction and Larval Ecology of Marine Invertebrates. 3 Credits.

Lecture 3 hours; 3 credits. Topics include the evolution of reproductive strategies, maturation, behavior, larval ecology, and recruitment.

OEAS 755. Mathematical Modeling of Marine Ecosystems. 3 Credits.

Lecture 3 hours; 3 credits. This course is focused on the theory and techniques of mathematical model development for marine ecosystems. The course is designed to provide an understanding of how to parameterize interaction among components of marine food webs and interaction of food web components with physical environments.

OEAS 764. Coastal Sedimentology. 3 Credits.

Lecture 2 hours; laboratory 2 hours; 3 credits. Sedimentary processes in different coastal zones will be described: carbonate, evaporitic, and clastic depositional systems. We will conduct a small research project along the coast of Virginia. Field trip required.

OEAS 765. Marine Biogeochemistry. 3 Credits.

Lecture 3 hours; 3 credits. This class will focus on biologically mediated elemental cycling in aquatic systems. Assimilatory and dissimilatory biological processes involving auto- and heterotrophic organisms frequently mediate elemental cycling of these elements. Inorganic compounds and dissolved and particulate organic material will be discussed in terms of their biological reactivity and turnover times in aquatic systems and their contribution to elemental cycling on a variety of temporal and spatial scales. Also included is the issue of how community structure and function alter biogeochemical cycles.

OEAS 770. Aquatic Photosynthesis. 4 Credits.

Lecture 3 hours; laboratory 3 hours; 4 credits. This course examines the physics, chemistry, biology and ecology of photosynthesis by aquatic organisms. Topics include light harvesting, energy transfer, carbon metabolism and biosynthesis and their ecological consequences.

OEAS 772. Aquatic Optics. 4 Credits.

Lecture 3 hours; laboratory 3 hours; 4 credits. The course covers the physics of light transmission through the aquatic medium as affected by scattering and absorption, the optical properties of seawater, suspended particles of living cells, underwater vision and ocean color.

OEAS 795. Advanced Topics in Oceanography. 1-4 Credits.

1-3 credits each semester. An advanced investigation of a selected problem in physical, geological, chemical, or biological oceanography under the direction of the faculty of the Department of Ocean, Earth and Atmospheric Sciences.

OEAS 800. Survival Skills for Scientists. 1 Credit.

Seminar 1 credit, P/F. Seminar class each fall and spring that will address a series of topics to improve student success as scientists.

OEAS 803. Stability of Ocean Flow. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisites: calculus, differential equations, geo-physical fluid dynamics. A study of the basic ideas and methods used to examine the stability of ocean currents. Topics include fundamentals, barotropic and baroclinic instability, wave packets and energy balance.

OEAS 804. Time Series in Oceanography. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: calculus. A study of the basic techniques used to model and analyze time series of oceanographic data. These include temporal spatial and frequency/wave number domain techniques.

OEAS 808. Simulation Techniques for Ocean Circulation. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisites: OEAS 730, and knowledge of a computer program language (FORTRAN preferred). Emphasis is on the construction of working ocean models, both vorticity-stream function and primitive equation models analyzed, mostly finite difference techniques, implicit and explicit schemes, staggered grids, discussion of ocean general circulation models.

OEAS 811. Regional Oceanography. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: OEAS 604. The regional oceanography of the major ocean basins, marginal seas, and coastal oceans. Seasonal and interannual variability. Heat and salt cycles.

OEAS 823. Ocean Turbulence and Mixing Processes. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisites: OEAS 730/830. This course will first provide a broad background in the concepts, theories and semi-analytical techniques used to describe turbulent motions and their effects in fluids. The various observational techniques that are presently used to measure turbulence in the ocean will be explored.

OEAS 830. Dynamical Oceanography II. 3 Credits.

Lecture 3 hours; 3 credits. Dynamics of rotating stratified fluids. Inertial waves, equatorial dynamics, coastal dynamics, dynamic instability.

OEAS 832. Advanced Geochemistry of Marine Sediments. 3 Credits.

Lecture 3 hours; 3 credits. Advanced topics in the geochemistry of marine sediments, with an emphasis on mathematical modeling of sedimentary geochemical processes.

OEAS 833. Marine Microbiology. 3 Credits.

Lecture, 3 hours. 3 credits. The course covers the distribution, abundance, and biogeochemical activities of microorganisms in the oceans, with emphasis on prokaryotic microbes and viruses. Symbioses with higher organisms, and applied aspects of marine microbiology, including biofouling and corrosion, invasive species, and marine biotechnology are also addressed.

OEAS 840. Plankton Dynamics. 3 Credits.

Lecture 3 hours; 3 credits. This course emphasizes the ecology of heterotrophic plankton from bacteria to protists, from metazoan invertebrate plankton to fish larvae. Students will explore the role of plankton groups and species in the context of pelagic ecosystems. Planktonic processes are not only relevant for the ocean ecosystem but also for fisheries, aquaculture, environmental and human health, and global climate. The course consists of lectures, discussion groups on selected reading material, and laboratory demonstrations.

OEAS 841. Fisheries Management. 4 Credits.

Lecture 4 hours; 4 credits. An introduction to the major questions in the management of marine fisheries: abundance, estimation, distribution, recruitment and optimum yield. Topics are presented within the context of fisheries management, marine productivity and population ecology, all of which shape the direction of the primary literature.

OEAS 843. Applied Methods of Fisheries. 4 Credits.

Lecture 2 hours; laboratory 4 hours; 4 credits. Prerequisite: OEAS 744/844. Practice, principles and theory of applied methods in fisheries. Sampling and data collection tools, practice, and theory. Principles and theory of age determination, estimation of abundance, reproductive biology, marking and tagging, and mark-recapture. Special topics as necessary.

OEAS 844. Fisheries Management. 3 Credits.

Lecture 3 hours; 3 credits. Quantitative methods for the description and management of fisheries. Analytical and empirical forecasting models used to study case histories of managed fish stocks. Case studies of poorly and well managed stocks.

OEAS 847. Reproduction and Larval Ecology of Marine Invertebrates. 3 Credits.

Lecture 3 hours; 3 credits. Topics include the evolution of reproductive strategies, maturation, behavior, larval ecology, and recruitment.

OEAS 855. Mathematical Modeling of Marine Ecosystems. 3 Credits.

Lecture 3 hours; 3 credits. This course is focused on the theory and techniques of mathematical model development for marine ecosystems. The course is designed to provide an understanding of how to parameterize interaction among components of marine food webs and interaction of food web components with physical environments.

OEAS 864. Coastal Sedimentology. 3 Credits.

Lecture 2 hours; laboratory 2 hours; 3 credits. Sedimentary processes in different coastal zones will be described: carbonate, evaporitic, and clastic depositional systems. We will conduct a small research project along the coast of Virginia. Field trip required.

OEAS 865. Marine Biogeochemistry. 3 Credits.

Lecture 3 hours; 3 credits. This class will focus on biologically mediated elemental cycling in aquatic systems. Assimilatory and dissimilatory biological processes involving auto- and heterotrophic organisms frequently mediate elemental cycling of these elements. Inorganic compounds and dissolved and particulate organic material will be discussed in terms of their biological reactivity and turnover times in aquatic systems and their contribution to elemental cycling on a variety of temporal and spatial scales. Also included is the issue of how community structure and function alter biogeochemical cycles.

OEAS 869. Internship in Oceanography. 1-3 Credits.

1-3 credits. Prerequisite: permission of the department.

OEAS 870. Aquatic Photosynthesis. 4 Credits.

Lecture 3 hours; laboratory 3 hours; 4 credits. This course examines the physics, chemistry, biology and ecology of photosynthesis by aquatic organisms. Topics include light harvesting, energy transfer, carbon metabolism and biosynthesis and their ecological consequences.

OEAS 872. Aquatic Optics. 4 Credits.

Lecture 3 hours; laboratory 3 hours; 4 credits. The course covers the physics of light transmission through the aquatic medium as affected by scattering and absorption, the optical properties of seawater, suspended particles of living cells, underwater vision and ocean color.

OEAS 895. Advanced Topics in Oceanography. 1-4 Credits.

1-3 credits each semester. An advanced investigation of a selected problem in physical, geological, chemical, or biological oceanography under the direction of the faculty of the Department of Ocean, Earth and Atmospheric Sciences.

OEAS 898. Doctoral Research. 1-9 Credits.

Any semester; hours to be arranged; variable credit, 1-9 credits per semester. Ph.D.-level research.

OEAS 899. Dissertation. 1-9 Credits.

Any semester; hours to be arranged; variable credit, 1-9 credits per semester. Ph.D.-level work primarily devoted to the writing of the dissertation.

OPMT - Operations Management

OPERATIONS MANAGEMENT Courses

OPMT 611. Operations Management with Quantitative Analysis. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: BNAL 600. Introduces concepts and frameworks for making decisions concerning designing, planning and controlling service and manufacturing operations. Concepts and issues related to process, layout, materials management, capacity, and quality, and how they affect productivity and customer satisfaction are discussed. Quantitative techniques such as linear programming, PERT/CPM, and control charts are used to make appropriate decisions.

OPMT 615. Operations & Supply Chain Management. 2 Credits.

This course focuses on the issues related to process, layout, production planning, materials management, quality, and lean manufacturing. The effects of these issues on productivity, firm performance, and customer satisfaction will be discussed. Furthermore, supply chain design, integration, and sustainability are discussed and analyzed. Prerequisites: Admission to the MBA Program, MBA 600, MBA 601, MBA 602, MBA 603, and MBA 604.

OPMT 624. Cooperative Education. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: OPMT 611. Discusses the operations function in service organizations. Concepts and issues related to characteristics of services, managing demand, designing and delivering services, service processes and quality, human resource management in service systems will be discussed.

OPMT 667. COOPERATIVE EDUCATION. 1-3 Credits.

1-3 credits. Prerequisite: graduate standing. Approval for enrollment and allowable credits are determined by the department and Career Management in the semester prior to enrollment.

OPMT 668. Operations Management Internship. 1-3 Credits.

1-3 credits. Prerequisite: graduate standing. Approval for enrollment and allowable credits are determined by the department and Career Management in the semester prior to enrollment.

OPMT 695. Selected Topics in Operations Management. 3 Credits.

3 credits. Prerequisite: permission of the department chair and the graduate program director.

OPMT 697. Independent Study in Operations Management. 3 Credits.

3 credits. Prerequisite: OPMT 611. Affords students the opportunity to undertake independent study under the direction of a faculty member.

OPMT 795. Topics. 3 Credits.

Lecture 3 hours; 3 credits.

OPMT 895. Topics. 3 Credits.

Lecture 3 hours; 3 credits.

PADM - Public Administration

PUBLIC ADMINISTRATION Courses

PADM 632. Environmental Planning. 3 Credits.

Lecture 3 hours; 3 credits. Environmental analysis and the planning process; administrative agency structure, policy development, regulation and enforcement, content and use of the environmental impact statement.

PADM 633. Methods of Urban Planning. 3 Credits.

Lecture 3 hours; 3 credits. A survey of the methods of local planning in the governmental and administrative setting. The course is geared toward the administrator and technician in dealing with urban planning problems.

PADM 634. Regional Planning. 3 Credits.

Lecture 3 hours; 3 credits. The course analyzes the origins of regional planning agencies, current organizational structures, financing and functional activities. The focus is on the application of the systems approach to metropolitan planning issues. This latter objective is achieved through participation in exercises dealing with economics, transportation and land-use allocation modeling.

PADM 640. Urban and Regional Issues. 3 Credits.

Lecture, 3 hours; 3 credits. Prerequisite: permission from an advisor. Basic definitions and concepts in urban studies, interdisciplinary perspectives on the urban process from the perspectives of history, economics, geography, sociology, political science and related disciplines. Some focus on the qualities of urban research activities.

PADM 651. Administrative Theory I: The Context of Public Administration. 3 Credits.

Lecture 3 hours; 3 credits. Introduction to the profession of public administration; the evolution and development of the field, the role of organizations in contemporary American government, and the roles of politics and administration. The course also provides an introduction to the necessary skills for successful graduate study.

PADM 652. Administrative Theory II: The Process of Public Administration. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: PADM 651. Introduction to management in the public sector. Topics include: organizing public agencies, managing people and work groups, introduction to organizational systems (human resources, budget, and information systems), and effective leadership and decision-making processes.

PADM 655. Theories of Public Organization. 3 Credits.

Lecture and discussion 3 hours; 3 credits. Analysis of public organizations from environmental (macro) and organizational (micro) viewpoints, viewed as both closed and open systems. The course also examines organizational behavior, design, structure and evaluation.

PADM 668. Internship/Field Experience. 3-6 Credits.

3 or 6 credits. Required of all students without previous experience in government service. Supervised work experience in a public agency. A written report will be required.

PADM 671. Public Budgeting and Financial Management. 3 Credits.

Lecture 3 hours; 3 credits. The purpose of this course is to examine the institutions, principles, and techniques of national, state, and local budgeting processes and financial administration. The course explores the allocation as well as the re-distributive role of government and the market. While applying information technology, students will analyze the practices and fundamental concepts of government budgeting, financial management, and public finance, with an emphasis on revenue, expenditure, capital budgeting and debt structures.

PADM 672. Public Financial Management. 3 Credits.

Examination of public sector financial management principles, practices and processes. Emphasis on financial auxiliary services employed in local government financial management. Introduction to governmental accounting practices and financial statements. Micro computer applications to public sector financial decision-making techniques. (Cross listed with PPCM 672).

PADM 690. Urban and Regional Issues. 3 Credits.

3 cr. Lecture. Prerequisite: permission from an advisor. Basic definitions and concepts in urban studies, interdisciplinary perspectives on the urban process from the perspectives of history, economics, geography, sociology, political science and related disciplines. Some focus on the qualities of urban research activities.

PADM 695. Advanced Topics. 1-3 Credits.

Lecture and discussion; 1-3 credits. Topics vary each semester.

PADM 696. Directed Readings. 1-3 Credits.

1-3 credits. Specifically planned readings for the graduate student who wishes to pursue special interests outside the scope of formal studies. Supervised on an individual basis.

PADM 698. Directed Research. 1-6 Credits.

1-6 credits. Supervised research on a specific program. A written report will be required.

PADM 699. Thesis. 3-6 Credits.

6 credits. An approved research project, written under the supervision of a faculty committee, in which the student demonstrates the capacity to design and complete independent scholarly investigation. The completed project must be approved by the thesis committee.

PADM 701. Public Policy and Evaluation. 3 Credits.

Exploration of key theories and approaches to public policy. This course covers all phases of the policy process, from formulation to evaluation, with particular focus upon the substance, political dynamics, and evolution of public policy.

PADM 702. Urban Resource Allocation. 3 Credits.

Lecture 3 hours; 3 credits. This course has three basic emphases: (a) theories of resource allocation; (b) analytical techniques useful in resource allocation analysis; and (c) methods of control for resource allocation. Includes techniques of cost effectiveness, budgeting, expenditure analysis as they relate to the urban environment.

PADM 704. Methods of Public Program Evaluation. 3 Credits.

Examination of various methodologies for designing and conducting program evaluation and research. Experimental, quasi-experimental and nonexperimental procedures will be covered. (Cross listed with PPCM 704) Prerequisites: PADM 753/PADM 853.

PADM 705. Urban Law and Public Policy. 3 Credits.

Lecture 3 hours; 3 credits. Focuses on legal aspects of urban policy by analyzing primary legal materials, including court decisions and legislative and administrative regulations. Skills of legal interpretation and legal draftsmanship are developed.

PADM 708. Urban and Regional Economic Development. 3 Credits.

Lecture 3 hours; 3 credits. This course examines the theory and practice of urban and regional economic development. The tools, institutions, and analytical techniques of urban and regional economic development are examined in light of relevant public policy issues.

PADM 711. Urban Services Administration. 3 Credits.

Lecture and discussion 3 hours; 3 credits. Analysis of the range of administrative tools and strategies for the delivery of urban services. Emphasizes new administrative alternatives under conditions of urban change.

PADM 712. Emergency Management and Policy. 3 Credits.

Lecture 3 hours; 3 credits. Explores policy and regulatory issues of emergency management; intergovernmental responsibilities and relationships among local, state and federal agencies in an "all hazards" approach to preparing and responding to manmade and natural disasters. Examines challenges faced by local, state, and federal managers during a large scale disaster.

PADM 714. Public-Private Partnerships. 3 Credits.

An in-depth analysis of the forces behind the privatization movement. Examines the context of privatization, the theoretical and empirical arguments on both sides of the debate, and the different forms of privatization practiced in the U.S. The course draws on a wide range of disciplines in a quest for an understanding of the privatization phenomenon—political science, public administration, public policy, sociology, economics, management, and others. (Cross listed with PPCM 714).

PADM 715. Management of Nonprofit Organizations. 3 Credits.

Lecture 3 hours; 3 credits. Successful nonprofit organizations require substantial capability in key areas of management such as developing a strong board of directors, recruiting and motivating talented staff and volunteers, creating a strategic plan and wisely managing fiscal and human resources. This course addresses these topics from theoretical and practitioner perspectives.

PADM 716. Introduction to Nonprofit Sector. 3 Credits.

Lecture 3 hours; 3 credits. This course offers a broad introduction to the study and practice of the nonprofit sector. The course explores the history, scope, and significance of the nonprofit sector as it relates to philanthropy, voluntary action, civil society, and civic engagement.

PADM 717. Nonprofit Financial Management and Fund Raising. 3 Credits.

Lecture 3 hours; 3 credits. This course provides students with the knowledge to become effective financial managers by giving them practical applications of theory and skill-building in fiscal processes and fundraising of nonprofit organizations.

PADM 718. Public Sector Contract Administration. 3 Credits.

Examines the actions that must be taken following the award of a contract, including assurance of required outcomes, assurance of compliance, proper contract launch, proper contract close-out, and documentation and carrying forward lessons learned. Connections to steps that must be taken in the other two phases of the procurement process are noted. (Course is cross listed with PPCM 718).

PADM 719. Leadership. 3 Credits.

Examines leadership through theoretical and practice-based frameworks. Offers analytical and intellectual examination and reflection on core issues in the practice of leadership. These objectives will be achieved through open discussion, honest self-assessment, experiential exercises, and observation of real-life leadership practice. (Cross listed with PPCM 719).

PADM 720. Public Personnel Administration. 3 Credits.

Lecture 3 hours; 3 credits. Examines the basic framework of the public personnel system beginning with the legal requirements imposed by federal and state laws and regulations. General considerations of policy and procedures development, the organization of the public personnel system, the adoption of the personnel ordinance, the determination of various levels of employee status and the coverage of the personnel system are included.

PADM 721. Transportation Policy. 3 Credits.

Lecture, 3 hours; 3 credits. This course focuses on surface transportation policy and planning, and highways and roads in particular. Topics include local, state and federal policies, public involvement in transportation planning, transportation and highway finance, privatization and public-private partnerships, critical issues and policy questions.

PADM 723. Ethics in Public Administration. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: PADM 651. This course reviews the theory and application of ethics in the public sector, identifying public values and how they apply in the administration of government. It reviews sources of values employed in public sector decision-making, and reviews how values in public administration are managed and applied. Systems of professional ethics are reviewed in the context of public professions. Case studies and best practices are examined to help the student understand the application of administrative ethics in public management.

PADM 724. Administration of Human Services. 3 Credits.

Lecture 3 hours; 3 credits. Analysis of human services involving direct client/agency interaction. Problems of discretion and control are examined as alternative service delivery strategies which can deal with these problems.

PADM 725. Business, Government, and Society. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: six completed hours of graduate work in MBA or MPA program. An overview of business-government-society interactions, with special attention to the influence of public policy and corporate strategy on corporate social responsibility. An important theme is the ethical component of management decision making.

PADM 726. Introduction to Public Procurement. 3 Credits.

This course provides an overview of procurement and contract management as a core function in public sector organizations. The course introduces the student to how properly-aligned, best practice acquisitions can support public entities' strategic goals. Challenges and opportunities for all stakeholders are addressed. Special attention is given to ongoing changes in public procurement. (Cross listed with PPCM 726).

PADM 727. Public Procurement and Project Management. 3 Credits.

Course covers each phase of the public procurement project cycle, with an emphasis on tools and techniques to manage a public procurement project. (Cross listed with PPCM 727).

PADM 728. Public Sector Contract Planning and Formation. 3 Credits.

This course provides insight into why and how public sector contracts should be planned and formed properly. A strong emphasis is placed on the strategic role that procurement can play in public sector organizations and how procurement planning and source selection, in particular, fit into that role. (Cross listed with PPCM 72.).

PADM 730. Theoretical Conflict Resolution and Problem Solving. 3 Credits.

Lecture 3 hours; 3 credits. An introduction to the field of alternative dispute resolution methods and problem solving. The first part of the course focuses on conflict theory at all levels of human social systems and the second part examines collaborative problem solving strategies.

PADM 731. Public Sector Procurement Law and Ethics. 3 Credits.

This course surveys the laws and ethics applicable to public sector procurement and contract management. A theoretical and problem-based, interdisciplinary approach is used to address the major legal and ethical issues that arise when public sector organizations plan, form, and administer contracts. Attention is given to the role of professionalization in socializing appropriate ethics. (Cross listed with PPCM 731).

PADM 733. Legal and Ethical Foundations of Public Administration. 3 Credits.

Lecture 3 hours; 3 credits. Introduces the role of law in ordering public administration through the application of constitutional values and administrative law principles in administrative practice. Introduces ethical theories and applications in the public sector, examining values within administrative environments. Topics include privacy in information systems management, whistleblowing, and other cases of applied ethical reasoning in the practice of public administration.

PADM 734. Negotiation and Dispute Resolution. 3 Credits.

The course provides conceptual and practical skills in negotiations. It examines the underlying cultural, legal, and organizational issues and problems that affect managing human resources in the workplace. (Cross listed with PPCM 734).

PADM 737. Digital Government. 3 Credits.

Lecture 3 hours; 3 credits. This course provides public administrators knowledge of current technology issues in the public sector and familiarizes them with technological tools used in delivering public services. The course explores administrative responsibility and accountability in digital government, and problems in managing technology in the public sector. Issues concerning citizen privacy, freedom of information requirements, planning, coordinating and sharing information among public sector agencies and the private sector, and building community networks are reviewed.

PADM 738. Conflict Mediation and Arbitration. 3 Credits.

Surveys the field of third-party intervention in dispute resolution. Provides practical skills in mediation and arbitration. Examines the nature and effectiveness of mediation in a wide variety of disputes including labor relations, community, family, environmental, and international conflicts.

PADM 745. Managing Development and Change in Organizations. 3 Credits.

Lecture/cases/activities; 3 credits. Examination of the theory and practice of organization development. Participants will take the role of change agent and public manager and apply a range of organization development techniques to public agency situations while giving attention to the particular cultural, political, legal and organizational characteristics of public organizations.

PADM 746. Capstone Seminar in Public Administration. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: completion of 30 hours in the MPA program or permission of instructor. Presents an integrated approach to the field of public administration, and examines the political, administrative, and social implications of administrative choices. The emphasis of the course will be a case approach to public administration and public management.

PADM 753. Research Methods in Public Administration. 3 Credits.

Lecture 3 hours; 3 credits. This course examines various methods for designing and conducting research, collecting and organizing data, and disseminating results. Information technology and applications to practical management problems and public research topics are emphasized.

PADM 781. Intergovernmental Management. 3 Credits.

Analysis of relationships among federal, state, and local governmental units in the delivery of governmental programs. Focus on intergovernmental issues in urban metropolitan regions. (Cross listed with PPCM 781).

PADM 795. Advanced Topics in Public Personnel Administration. 3 Credits.

Lecture 3 hours; 3 credits. An examination of selected topics including job analysis, position classification, test construction, performance appraisal, and affirmative action. The course emphasizes the everyday application of these topics through in-class exercises and short papers. Permission of advisor is required.

PADM 830. Theories of Conflict Resolution and Problem Solving. 3 Credits.**PADM 845. Managing Development and Change in Organizations. 3 Credits.****PADM 998. PADM 998. 1 Credit.****PADM 999. Public Administration 999. 1 Credit.**

PAUP - Public Administration and Urban Policy

PUBLIC ADMIN/URBAN POLICY Courses

PAUP 801. Theories of Public Policy. 3 Credits.

Lecture 3 hours; 3 credits. Exploration of key theories and approaches to public policy. This course covers all phases of the policy process, from formulation to evaluation, with particular focus upon the substance, political dynamics, and evolution of public policy.

PAUP 802. Logic of Social Inquiry. 3 Credits.

Lecture 3 hours; 3 credits. Social inquiry, the production and application of social science knowledge in the field of public administration/ public management and urban policy, is replete with contending philosophical and paradigmatic points of view. The goal of this course is to provide a forum for students to review and critique the major issues within social inquiry: ways of knowing (questions of epistemology and methodology), ways of deciding and ways of acting upon decisions.

PAUP 803. Multivariate Quantative Analysis for Public Administration. 3 Credits.

This course explores the proper use, calculation, and interpretation of multivariate statistics as commonly found in the literature in public administration. The course will prepare students to choose the appropriate statistical tools, generate testable hypotheses, correctly apply the statistical tool, analyze the results, and present and interpret the results of those tests in a manner appropriate for public in the field.

PAUP 804. Policy and Program Evaluation. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: PADM 753 or URBN 607. Examination of various methodologies for designing and conducting public urban program evaluation and research. Experimental, quasi-experimental and nonexperimental procedures will be covered.

PAUP 806. Urban Resource Allocation. 3 Credits.**PAUP 807. Urban Theory and Practice. 3 Credits.**

Lecture 3 hours; 3 credits. Prerequisite: permission of instructor or graduate program director. The purpose of this course is to convey an understanding of urban theory and practice in the culturally diverse urban environment. The course focuses on the process of urbanization, social differentiation, and social and political organization. Special emphasis is given to the role of technology in contributing to urban change.

PAUP 808. Intellectual Foundations of Public Administration. 3 Credits.

Lecture 3 hours; 3 credits. The course reviews the broad topics of administration theory, behavior and practice in organizations and focuses on the development of management thoughts, as well as the macro and micro organizational processes in public and non-profit organizations.

PAUP 809. Public Organization Behavior and Theory. 3 Credits.

Lecture 3 hours; 3 credits. This course is intended to provide a forum for students to discuss and advance their knowledge of the broad classical and modern organizations theories and behavior. The goal is that in the process of discussing the theories of organization, students will develop expertise in specific, cutting edge areas of academic thoughts of the field.

PAUP 810. Governance and Accountability. 3 Credits.

Lecture 3 hours; 3 credits. Public law defines the structure and authorized practices of public institutions in urban settings. The course reviews the legal powers of state and local government in the U.S., of cities, counties, public authorities and special districts, and of nontraditional forms of governance including principal-agent relations in the production of public services, regulatory governance, delegation of public authority to private entities, and citizen roles in governance.

PAUP 811. Urban Services Administration. 3 Credits.

Lecture and discussion 3 hours; 3 credits. Analysis of the range of administrative tools and strategies for the delivery of urban services. Emphasizes new administrative alternatives under conditions of urban change.

PAUP 812. Public Policy Formulation and Implementation. 3 Credits.

Lecture 3 hours; 3 credits. This course focuses on public policy formulation and implementation. The purpose of this course is to examine the bases upon which public policy discussions take place, both at the formulation and implementation stages of the policy process. The goal is to develop a solid understanding of theory and empirical research bearing on critical dimensions of policy and the policy process.

PAUP 813. Contemporary Public Administration Theory. 3 Credits.

Lecture 3 hours, 3 credits. The purpose of this course is to enhance the knowledge inventory of doctoral students and better prepare them for academic careers in the field of public administration in the long term. Students will be exposed to a discussion of the current literature on legitimacy issues, phenomenological issues, gender issues, and Postmodernism in public administration.

PAUP 814. Public-Private Partnerships. 3 Credits.

Lecture 3 hours; 3 credits. An in-depth analysis of the forces behind the privatization movement. Examines the context of privatization, the theoretical and empirical arguments on both sides of the debate, and the different forms of privatization practiced in the U.S. The course draws on a wide range of disciplines in a quest for an understanding of the privatization phenomenon—political science, public administration, public policy, sociology, economics, management, and others.

PAUP 817. Nonprofit Financial Management & Fundraising. 3 Credits.

This course provides students with the knowledge to become effective financial managers by giving them practical applications of theory and skill-building in fiscal processes and fundraising of nonprofit organizations.

PAUP 820. Public Personnel Administration. 3 Credits.

Lecture 3 hours; 3 credits. Examines the basic framework of the public personnel system beginning with the legal requirements imposed by federal and state laws and regulations. General considerations of policy and procedures development, the organization of the public personnel system, the adoption of the personnel ordinance, the determination of various levels of employee status and the coverage of the personnel system are included.

PAUP 821. Transportation Policy. 3 Credits.

This course focuses on surface transportation policy and planning, and highways and roads in particular. Topics include local, state and federal policies, public involvement in transportation planning, transportation and highway finance, privatization and public-private partnerships, critical issues and policy questions.

PAUP 823. Ethics in Public Administration. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: PADM 651. This course reviews the theory and application of ethics in the public sector, identifying public values and how they apply in the administration of government. It reviews sources of values employed in public sector decision-making, and reviews how values in public administration are managed and applied. Systems of professional ethics are reviewed in the context of public professions. Case studies and best practices are examined to help the student understand the application of administrative ethics in public management.

PAUP 824. Administration of Human Services. 3 Credits.

Lecture 3 hours; 3 credits. Analysis of human services involving direct client/agency interaction. Problems of discretion and control are examined as alternative service delivery strategies which can deal with these problems.

PAUP 825. Business, Government, and Society. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: six completed hours of graduate work in MBA or MPA program. An overview of business-government-society interactions, with special attention to the influence of public policy and corporate strategy on corporate social responsibility. An important theme is the ethical component of management decision making.

PAUP 830. Theories of Conflict Resolution and Problem Solving. 3 Credits.

Lecture 3 hours; 3 credits. An introduction to the field of alternative dispute resolution methods and problem solving. The first part of the course focuses on conflict theory at all levels of human social systems and the second part examines collaborative problem solving strategies.

PAUP 833. Legal Foundations of Public Administration. 3 Credits.

Lecture 3 hours; 3 credits. Focus on the processes of law and law application by the executive departments of government and especially the independent regulatory agencies, and their control by legislature and court. Examination of the political origins and constitutional status of administrative agencies and of administration discretion.

PAUP 834. Negotiation and Dispute Resolution. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: PADM 730. The course provides conceptual and practical skills in negotiations. It examines the underlying cultural, legal, and organizational issues and problems that affect managing human resources in the workplace.

PAUP 837. Digital Government. 3 Credits.

Lecture 3 hours; 3 credits. This course provides public administrators knowledge of current technology issues in the public sector and familiarizes them with technological tools used in delivering public services. The course explores administrative responsibility and accountability in digital government, and problems in managing technology in the public sector. Issues concerning citizen privacy, freedom of information requirements, planning, coordinating and sharing information among public sector agencies and the private sector, and building community networks are reviewed.

PAUP 838. Conflict Mediation and Arbitration. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: PADM 730. Surveys the field of third-party intervention in dispute resolution. Provides practical skills in mediation and arbitration. Examines the nature and effectiveness of mediation in a wide variety of disputes including labor relations, community, family, environmental, and international conflicts.

PAUP 845. Managing Development and Change in Public Organizations. 3 Credits.

Lecture/cases/activities; 3 credits. Examination of the theory and practice of organization development. Participants will take the role of change agent and public manager and apply a range of organization development techniques to public agency situations while giving attention to the particular cultural, political, legal and organizational characteristics of public organizations.

PAUP 853. Research and Evaluation Design. 3 Credits.

Lecture 3 hours; 3 credits. The course examines advanced research design and evaluation methods used in public administration and management research. Experimental, quasi-experimental, and non-experimental procedures in the context of urban settings will be emphasized. Includes usage of various statistical software.

PAUP 854. Advanced Public Program Evaluation. 3 Credits.

PAUP 857. Advanced Public Research and Decision Making Methods. 3 Credits.

PAUP 868. Urban Services Internship. 3 Credits.

3 credit hours. Urban field experience for students in the Ph.D. in Public Administration and Urban Policy program. Supervised work experience in a public agency. A written report is required.

PAUP 881. Intergovernmental Relations. 3 Credits.

Lecture 3 hours; 3 credits. Analysis of relationship among federal, state, and local governmental units in the delivery of governmental programs. Focus on intergovernmental issues in urban metropolitan regions.

PAUP 890. Dissertation Seminar. 3 Credits.

3 credit hours. A multidisciplinary seminar that focuses on the design, implementation, and evaluation of urban programs under real-life conditions in the field. Students and faculty work with urban decision makers utilizing problem-solving skills and analysis.

PAUP 895. Advanced Topics in Public Personnel Administration. 3 Credits.

PAUP 898. Directed Research. 1-6 Credits.

1-6 credits. Supervised research on a specific problem. A written report is required.

PAUP 899. Dissertation. 1-12 Credits.

1 to 12 credits. An approved research project, written under the supervision of a faculty advisor, in which the student demonstrates the capacity of design and completes independent applied research. The completed project must be approved by the dissertation committee.

PE - Physical Education

PHYSICAL EDUCATION Courses

PE 504. Adapted Physical Education. 3 Credits.

Students will be acquainted with and research the different disabilities, learning modes of the exceptional child, IDEA-the law that advocates free and appropriate education, and working with the child with disabilities within an ecosystem. A vital component of the course will be the practical application of theory.

PE 509. Physiology of Exercise. 3 Credits.

An investigation into the physiological adjustments of the human organism to exercise including systematic as well as biochemical molecular changes. Major areas of concern include neuromuscular, metabolic, and cardiorespiratory changes during exercise and the influence of such variables as nutrition, drugs, environment, age, sex, training and body weight.

PE 597. Topics in Health and Physical Education. 1-3 Credits.

This course provides an opportunity for in-depth study of selected topics in health and physical education. Prerequisites: approval of program advisor.

PHIL - Philosophy

PHILOSOPHY Courses

PHIL 502. Gender and Philosophy. 3 Credits.

A philosophical survey of approaches to understanding gender and gender differences. The course will also serve as an introduction to feminist philosophy, with a particular emphasis on feminist ethics.

PHIL 504. Twentieth-Century Continental Philosophy. 3 Credits.

A study of influential contemporary movements in European philosophy. Emphasis will be given to the writings of Husserl, Heidegger, Sartre, Gadamer, Derrida, and Foucault.

PHIL 506. Contemporary Analytic Philosophy. 3 Credits.

A study of the twentieth-century analytic tradition, including such thinkers as Moore, Russell, Wittgenstein, Ayer, Carnap, Ryle, Wisdom, and Austin.

PHIL 510. Social and Political Philosophy. 3 Credits.

A philosophical analysis of the relation between man, society, and the state, studying about a dozen philosophers since Plato on such topics as justice, authority, law, freedom, and civil rights.

PHIL 511. Postmodernism and Political Philosophy. 3 Credits.

An examination of intellectual currents in postmodernism as they pertain to central questions in social and political thought. The course covers the roots of modernism in the Enlightenment and various challenges to modernism in 19th and 20th century thought. Particular attention is given to the prospects for democracy in postmodern thinking.

PHIL 512. Philosophy of Law. 3 Credits.

An examination of the nature of law and philosophical issues concerning the law.

PHIL 517. Philosophy and Educational Issues. 3 Credits.

Considers the relationship of philosophy and education. Topics considered include: philosophy as a foundation for education, education as an institution, and educational and philosophical issues as they relate to each other.

PHIL 523. Philosophy of Work. 3 Credits.

An examination of philosophical issues surrounding the practice of work. Topics to be discussed may include the definition of work, alienation, exploitation, whether there is a right to work or a right not to work, religious perspectives on work, and gender issues in work.

PHIL 527. Myth and Philosophy. 3 Credits.

A study of the nature of myth, its role and importance in human thought. The analysis will stress the relationships between mythology, religion, literature, drama, and philosophy in ancient Greece.

PHIL 531. Nineteenth-Century Philosophy. 3 Credits.

A study of significant intellectual innovations and revolutions in nineteenth century European thought that helped shape the modern mind. Emphasis will be given to the writings of Kant, Schopenhauer, Hegel, Marx, Kierkegaard and Nietzsche.

PHIL 534. Contemporary Theory of Knowledge. 3 Credits.

This course provides students with a problem-oriented, critical, and comparative understanding of problems in contemporary epistemology. Topics include skepticism and responses thereto, analyses of knowledge, the externalist versus internalist debate, foundationalism and coherentism, and social approaches to knowledge including contextualism and feminism.

PHIL 535. Philosophy of Psychology. 3 Credits.

An examination of various ways in which the mind has been understood in philosophy and in psychology and of the methods that have been used in the study of the mind.

PHIL 540. Philosophy of Natural Sciences. 3 Credits.

A study of the concepts and philosophical problems common to the natural sciences: scientific reasoning, confirmation, explanation, laws, meaning, theories, revolutions, progress, and values.

PHIL 541. Foundations of Ethics. 3 Credits.

An inquiry into the philosophical foundations of ethical theory. Various ethical systems are considered, and different views of metaethics and moral psychology may be as well.

PHIL 542. Studies in Applied Ethics. 3 Credits.

An intensive examination of ethical issues in a particular field or profession; an emphasis on ethical theory underlying practical decisions.

PHIL 580. Hinduism. 3 Credits.

An intensive study of the basic teachings of Hinduism as manifested in its sacred writings.

PHIL 581. Buddhism. 3 Credits.

A study of the origin, historical development, and contemporary status of Buddhism, in terms of its religious and philosophical elements and its influence in Asian cultures.

PHIL 582. Chinese Religion and Philosophy. 3 Credits.

A study of Chinese thought emphasizing Early and Classical Confucianism and Taoism, Chinese Buddhism, and NeoConfucianism. Modern currents of Chinese thought are also discussed.

PHIL 585. Japanese Religion and Philosophy. 3 Credits.

A study of the religious and philosophical traditions of Japan. Emphasis will be given to Shintoism, Buddhism, and Neo-Confucianism and their contemporary status and influence in Japanese culture.

PHIL 591. Seminar in Philosophy. 3 Credits.

Intensive examination of the thought of one major philosopher.

PHIL 592. Seminar in Philosophy. 3 Credits.

Intensive examination of the thought of one major philosopher.

PHIL 593. Seminar in Philosophy. 3 Credits.

Intensive examination of the thought of one major philosopher.

PHIL 594. Seminar in Philosophy. 3 Credits.

Intensive examination of the thought of one major philosopher.

PHIL 595. Topics in Philosophy. 1-3 Credits.

The advanced study of selected topics designed to permit small groups of qualified students to work on subjects of mutual interest which, due to their specialized nature, may not be offered regularly. These courses will appear in the course schedule, and will be more fully described in information distributed to all academic advisors.

PHIL 596. Topics in Philosophy. 1-3 Credits.

The advanced study of selected topics designed to permit small groups of qualified students to work on subjects of mutual interest which, due to their specialized nature, may not be offered regularly. These courses will appear in the course schedule, and will be more fully described in information distributed to all academic advisors.

PHIL 597. Tutorial Work in Special Topics in Philosophy. 1-3 Credits.

Independent reading and study of a topic to be selected under the direction of an instructor. Conferences and papers as appropriate.

PHIL 598. Tutorial Work in Special Topics in Philosophy. 1-3 Credits.

Independent reading and study of a topic to be selected under the direction of an instructor. Conferences and papers as appropriate.

PHIL 603. Studies in Social and Political Philosophy. 3 Credits.

An intensive study of one or more figures, movements, or theoretical questions in social and political philosophy. Prerequisites: One 500-level Philosophy course with a grade of "B" or higher (or equivalent).

PHIL 606. Studies in Asian Philosophy. 3 Credits.

An intensive study of one concept, movement, or thinker indigenous to the Asian philosophical tradition.

PHIL 608. Studies in Ancient Philosophy. 3 Credits.

A study of certain philosophers, movements or specific philosophical issues in the ancient Greek and early Roman periods. Prerequisites: One 500-level Philosophy course with a grade of "B" or higher (or equivalent).

PHIL 609. Studies in the Philosophy of Science. 3 Credits.

A consideration of some philosophical problem or problem area related to science or to some position or tradition in the philosophy of science. Prerequisites: One 500-level Philosophy course with a grade of "B" or higher (or equivalent).

PHIL 610. Studies in the Philosophy of Art. 3 Credits.

An evaluation of the field of art in relation to the rest of human culture, emphasizing the various approaches that may be used. Prerequisites: One 500-level Philosophy course with a grade of "B" or higher (or equivalent).

PHIL 611. Studies in the History of Philosophy. 3 Credits.

A consideration of selected themes in the history of philosophy, or the specific examination of one major philosopher or group of related philosophers. Prerequisites: One 500-level Philosophy course with a grade of "B" or higher (or equivalent).

PHIL 695. Topics in Philosophy. 3 Credits.

Prerequisites: One 500-level Philosophy course with a grade of "B" or higher (or equivalent). The advanced study of selected topics designed to permit small groups of qualified students to work in subjects of mutual interest that, due to their specialized nature, may not be offered regularly.

PHIL 697. Tutorial Work in Special Topics in Philosophy. 1-3 Credits.

Independent reading and study on a topic to be selected under the direction of an instructor. Conferences and papers as appropriate. Prerequisites: approval of the department chair and one 500-level Philosophy course with a grade of "B" or higher (or equivalent).

PHIL 698. Tutorial Work in Special Topics in Philosophy. 1-3 Credits.

Independent reading and study on a topic to be selected under the direction of an instructor. Conferences and papers as appropriate. Prerequisites: approval of the department chair and one 500-level Philosophy course with a grade of "B" or higher (or equivalent).

PHIL 707. Ethics in Public Health Practice. 1-3 Credits.

An investigation of ethical issues in public health policy, practice, and research. Students will develop a capacity for reasoned judgments in these matters by understanding and applying basic moral concepts, theories, and ideals. Prerequisites: open to all graduate students in relevant fields.

PHIL 710. International Rights. 3 Credits.

A philosophical study of rights applicable to the international arena. Theories from the early Modern European period to the present day will be treated. Coverage includes international law, the rights of nations, and human rights. Prerequisites: approval of instructor.

PHIL 795. Topics in Philosophy. 3 Credits.

The advanced study of special topics that may not be offered regularly.

PHIL 797. Tutorial in Philosophy. 1-3 Credits.

Independent reading and study on a topic to be selected under the direction of an instructor. Conferences and papers as appropriate. Prerequisites: approval of the department chair.

PHIL 807. Ethics in Public Health Practice. 1-3 Credits.

An investigation of ethical issues in public health policy, practice, and research. Students will develop a capacity for reasoned judgments in these matters by understanding and applying basic moral concepts, theories, and ideals. Prerequisites: Open to all graduate students in relevant fields.

PHIL 810. International Rights. 3 Credits.

A philosophical study of rights applicable to the international arena. Theories from the early Modern European period to the present day will be treated. Coverage includes international law, the rights of nations, and human rights. Prerequisites: approval of instructor.

PHIL 895. Topics in Philosophy. 3 Credits.

The advanced study of special topics that may not be offered regularly.

PHIL 897. Tutorial in Philosophy. 1-3 Credits.

Independent reading and study on a topic to be selected under the direction of an instructor. Conferences and papers as appropriate. Prerequisites: approval of the department chair.

PHYS - Physics

PHYSICS Courses

PHYS 503. Electronic Instrumentation. 3 Credits.

PHYS 506. Observational Astronomy. 3 Credits.

Lecture 3 hours; 3 credits. Observational techniques in astronomy with emphasis on constellation identification, celestial movements, and telescopic observation. Individualized night observations are required.

PHYS 508. Astronomy for Teachers. 3 Credits.

Lecture 3 hours; 3 credits. A course in astronomy dealing with stars and stellar systems. Topics will include observational astronomy, the electromagnetic spectrum, relativity, stellar and galactic structures, cosmology, and the search for extraterrestrial intelligence.

PHYS 513. Methods of Experimental Physics. 3 Credits.

Laboratory 6 hours; 3 credits. Experiments in classical and modern physics, designed to develop skills in the collection, analysis, and interpretation of experimental data.

PHYS 515. Introduction to Nuclear Particle Physics. 3 Credits.

Lecture 3 hours; 3 credits. An introduction to the structure of the atomic nucleus, natural and artificial radioactivity, nuclear decay processes and stability of nuclei, nuclear reactions, properties of nuclear forces, and nuclear models. Also, particle phenomenology, experimental techniques and the standard model. Topics include the spectra of leptons, mesons, and baryons; strong, weak, and electromagnetic interactions.

PHYS 516. Introduction to Solid State Physics. 3 Credits.

Introduction to solid state physics and materials science, with emphasis placed on the applications of each topic to experimental and analytical techniques. Topics include crystallography, thermal and vibrational properties of crystals and semiconductors, metals and the band theory of solids, superconductivity and the magnetic properties of materials.

PHYS 517. Introduction to Particle Accelerator Physics. 3 Credits.

Lecture 3 hours; 3 credits. Introduction to the historical development and applications of particle accelerators to the fields of nuclear physics, particle physics, material sciences, and medical therapy and the design and physics of particle accelerators. Aspects of linear accelerators, circular accelerators such as cyclotrons, betatrons, synchrotrons, and storage rings, and recirculated linacs are covered. Topics include linear and non-linear single particle motion in accelerators, collective effects and beam stability in particle accelerators, and the electromagnetic radiation emitted by relativistic particles in accelerators. Up to date descriptions of the most modern particle accelerators will be included, as well as applications such as fixed target nuclear physics arrangements, colliding beam accelerators for high energy physics research, advanced storage ring sources of X-Rays, advanced neutron sources, radiation and radioactive material sources, and cancer therapy devices.

PHYS 520. Introductory Computational Physics. 3 Credits.

Introduction of computational methods and visualization techniques for problem solving in physics.

PHYS 525. Electromagnetism I. 3 Credits.

Lecture, 3 hours. 3 credits. A study of the classical theory and phenomena of electricity and magnetism. Topics include the calculation of electric and magnetic fields, magnetic and dielectric properties of matter, and an introduction to Maxwell's equations.

PHYS 551. Theoretical Mechanics. 3 Credits.

A mathematical study of the concepts of mechanics. Vector calculus methods are used. Topics include mechanics of a system of particles, Lagrangian mechanics, Hamilton's canonical equations, and motion of a rigid body.

PHYS 552. Introduction to Quantum Mechanics. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisites: PHYS 319 and 323. Introduction to the physical and mathematical structure of quantum theory, including the historical and experimental origins of the subject. The curriculum includes techniques for solving the Schrodinger wave equation, particularly for the harmonic oscillator and the hydrogen atom.

PHYS 553. Electromagnetism II. 3 Credits.

A course in electrodynamics developed from Maxwell's Equations. Topics include Maxwell's Equations, Conservation Laws, Electromagnetic Waves, Potentials and Fields, Radiation, and the interplay of electrodynamics and special relativity.

PHYS 554. Thermal and Statistical Physics. 3 Credits.

Lecture 3 hours; 3 credits. A study of the fundamental concepts of thermodynamics, kinetic theory, and statistical mechanics. Topics include the thermodynamics of simple systems, kinetic theory of gases, statistical mechanics of gases and an introduction to quantum statistics.

PHYS 556. Intermediate Quantum Mechanics. 3 Credits.

This course follows directly from PHYS 552. It includes a more detailed study of simple systems, an introduction to abstract quantum mechanics and Dirac notation, and applications to operator methods. Particular attention is paid to electron spin, angular momentum theory, operator treatment of the harmonic oscillator, the Pauli exclusion principle, perturbation theory, and scattering.

PHYS 597. Special Problems and Research. 1-3 Credits.

1-3 credits each semester. Prerequisite: permission of the instructor. These courses afford the student an opportunity to pursue individual study and research.

PHYS 601. Mathematical Methods in Physics. 3 Credits.

Lecture 3 hours; 3 credits. Basic mathematical methods and their applications: infinite series, functions of complex variables, complex analysis, Fourier series, Fourier and Laplace transformations.

PHYS 603. Classical Mechanics. 3 Credits.

Lecture 3 hours; 3 credits. Particle in a central-force field. Dynamics in a rotating reference frame. Lagrangian and Hamiltonian formulations. Small oscillations. Kinematics and dynamics of a rigid body. Canonical transformation, Hamilton-Jacobi theory.

PHYS 604. Classical Electrodynamics I. 3 Credits.

Lecture 3 hours; 3 credits. Electrostatics: Gauss' Law and Poisson and Laplace equations. Methods for the solution of boundary-value problems with rectangular, cylindrical, and spherical symmetry. Expansion in multipoles. Dielectrics. Magnetostatics and Faraday's law.

PHYS 621. Quantum Mechanics I. 3 Credits.

Lecture 3 hours; 3 credits. Mathematical foundations of Hilbert spaces. Background on Hamiltonian mechanics and electro-magnetism. Postulates of Quantum Mechanics, measurements and Schrodinger equation. Simple systems. Schrodinger Equation in 1-3 dimensions and solutions for specific systems. Symmetries and angular momentum. Time-independent perturbation theory.

PHYS 695. Selected Topics in Pure and Applied Physics. 1-3 Credits.

1-3 credits. Prerequisite: permission of the instructor.

PHYS 696. Special Topics in Accelerator Physics. 3 Credits.

Special topics related to particle accelerators and their applications. Departmental approval required.

PHYS 697. Seminar. 1 Credit.**PHYS 698. Research. 3 Credits.****PHYS 699. Research. 3 Credits.****PHYS 701. Mathematical Methods of Physics II. 3 Credits.**

Lecture, 3 hours; 3 credits. Prerequisite: PHYS 601. Group theory, Lie groups and Lie algebras, differential geometry, tensor fields on manifolds, integral calculus of differential forms.

PHYS 704. Classical Electrodynamics II. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: PHYS 604. Electrodynamics: Maxwell equations, plane electromagnetic waves and wave propagation, waveguides, radiating systems, special theory of relativity, including the dynamics of relativistic particles and electromagnetic fields.

PHYS 707. Statistical Mechanics. 3 Credits.

Lecture 3 hours; 3 hours; 3 credits. Prerequisite: PHYS 603. Review of thermodynamics. Classical statistical mechanics and applications. The virial expansion. Quantum statistical mechanics and the micro-canonical, canonical, and grand-canonical ensembles. The Fermi and Bose gases, and applications. Superfluids.

PHYS 711. Computational Physics. 3 Credits.

Lecture 3 hours; 3 credits. Studies of high level computer languages. Computational techniques used in physics. Numerical techniques for differential and integral problems. Algebraic processing languages. Introduction to scientific visualization techniques.

PHYS 721. Quantum Mechanics II. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: PHYS 621. Further development of quantum mechanics. Multi-particle states, bosons and fermions. Classical Limit. Variational principle, time-dependent perturbation theory and scattering. Path integral formulation. Symmetry and groups, addition of angular moments. Examples from solid state, atomic, nuclear, and particle physics.

PHYS 722. Nuclear and Particle Physics I. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: PHYS 621. Nuclear forces, models of nuclear structure and reactions, hadron and lepton scattering, introduction to constituent quark model and hadron spectroscopy.

PHYS 723. Nuclear and Particle Physics II. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: PHYS 722 or PHYS 822. Discrete and continuous symmetries and application to particle physics, SU(2) and SU(3) symmetries and static properties of hadron. Klein-Gordon and Dirac equations, quantum electrodynamics and Feynman rules, strong and weak interactions, Standard Model and physics beyond the Standard Model.

PHYS 724. Solid State I. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: PHYS 621. The first part of the condensed matter course includes electronic and lattice properties of solids, band structures of metals, semiconductors and insulators, dynamics of electron and phonons, electromagnetic and optical properties of metals and doped semiconductors, phenomenology of superconductivity and magnetism, and selected experimental methods of solid state physics.

PHYS 727. Atomic Physics. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: permission of the instructor. Irreducible tensor methods. Radiative excitation and ionization processes. Atom-atom scattering. Time-evolution of atomic observables in external fields. Multiple channel quantum defect theory and complex atomic and molecular spectra.

PHYS 731. Advanced Seminar I. 1 Credit.

Written and oral communication skills as applied to physics. Data display techniques to prepare scientific reports.

PHYS 732. Advanced Seminar II. 1 Credit.

Lecture 1 hour; 1 credit. Methodology of scientific information retrieval. Organization of information in selected research areas.

PHYS 750. Quantum Electronics. 3 Credits.

Lecture, 3 hours; 3 credits. Prerequisite: PHYS 604. Interaction of quantized electromagnetic field with matter, including photon coherence, theory of laser, nonlinear optics and selected applications.

PHYS 754. Accelerator Physics. 3 Credits.

Lecture, 3 hours; 3 credits. Prerequisites: PHYS 601, PHYS 603, and PHYS 704 or PHYS 804. Department approval required. Overview of the underlying physics of modern particle accelerators. Acceleration, beam transport, nonlinear dynamics, coherent synchrotron radiation, wakefields and impedances, collective effects, phase space cooling, free-electron lasers, novel methods of acceleration, accelerator systems.

PHYS 760. Low Temperature Physics. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: PHYS 604, PHYS 707 or PHYS 807, and PHYS 721 or PHYS 821. Properties and behavior of materials and systems at low temperature. Bose and Fermi systems, superconductivity, superfluidity, condensates.

PHYS 797. Research. 1-6 Credits.**PHYS 801. Mathematical Methods of Physics II. 3 Credits.**

Lecture, 3 hours; 3 credits. Prerequisite: PHYS 601. Group theory, Lie groups and Lie algebras, differential geometry, tensor fields on manifolds, integral calculus of differential forms.

PHYS 804. Classical Electrodynamics II. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: PHYS 604. Electrodynamics: Maxwell equations, plane electromagnetic waves and wave propagation, waveguides, radiating systems, special theory of relativity, including the dynamics of relativistic particles and electromagnetic fields.

PHYS 807. Statistical Mechanics. 3 Credits.

Lecture 3 hours; 3 hours; 3 credits. Prerequisite: PHYS 603. Review of thermodynamics. Classical statistical mechanics and applications. The virial expansion. Quantum statistical mechanics and the micro-canonical, canonical, and grand-canonical ensembles. The Fermi and Bose gases, and applications. Superfluids.

PHYS 811. Computational Physics. 3 Credits.

Lecture 3 hours; 3 credits. Studies of high level computer languages. Computational techniques used in physics. Numerical techniques for differential and integral problems. Algebraic processing languages. Introduction to scientific visualization techniques.

PHYS 821. Quantum Mechanics II. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: PHYS 621. Further development of quantum mechanics. Multi-particle states, bosons and fermions. Classical Limit. Variational principle, time-dependent perturbation theory and scattering. Path integral formulation. Symmetry and groups, addition of angular moments. Examples from solid state, atomic, nuclear and particle physics.

PHYS 822. Nuclear and Particle Physics I. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: PHYS 621. Nuclear forces, models of nuclear structure and reactions, hadron and lepton scattering, introduction to constituent quark model and hadron spectroscopy.

PHYS 823. Nuclear and Particle Physics II. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: PHYS 722 or PHYS 822. Discrete and continuous symmetries and application to particle physics, SU(2) and SU(3) symmetries and static properties of hadron. Klein-Gordon and Dirac equations, quantum electrodynamics and Feynman rules, strong and weak interactions. Standard Model and physics beyond the Standard Model.

PHYS 824. Solid State I. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: PHYS 621. The first part of the condensed matter course includes electronic and lattice properties of solids, band structures of metals, semiconductors and insulators, dynamics of electron and phonons, electromagnetic and optical properties of metals and doped semiconductors, phenomenology of superconductivity and magnetism, and selected experimental methods of solid state physics.

PHYS 825. Solid State II. 3 Credits.

Lecture, 3 hours; 3 credits. Prerequisite: PHYS 724 or PHYS 824. The second part of the condensed matter course is mostly focused on many body and collective effects in condensed matter, including phase transitions, Bose and Fermi quantum liquids, superfluidity, superconductivity and magnetism, and properties of mesoscopic and low-dimensional systems.

PHYS 827. Atomic Physics. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: permission of the instructor. Irreducible tensor methods. Radiative excitation and ionization processes. Atom-atom scattering. Time-evolution of atomic observables in external fields. Multiple channel quantum defect theory and complex atomic and molecular spectra.

PHYS 831. Advanced Seminar I. 1 Credit.

Written and oral communication skills as applied to physics. Data display techniques to prepare scientific reports.

PHYS 832. Advanced Seminar II. 1 Credit.

Lecture 1 hour; 1 credit. Methodology of scientific information retrieval. Organization of information in selected research areas.

PHYS 842. Advanced Quantum Mechanics. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisites: PHYS 704, PHYS 721. Introduction to relativistic quantum mechanics; symmetries in relativistic wave equations; solutions to relativistic wave equations for bound states and scattering processes; classical field theory and role of symmetries in construction of conserved currents; introduction to second quantization of fields.

PHYS 850. Quantum Electronics. 3 Credits.

Lecture, 3 hours; 3 credits. Prerequisite: PHYS 604. Interaction of quantized electromagnetic field with matter, including photon coherence, theory of laser, nonlinear optics and selected applications.

PHYS 853. Atomic & Molecular Physics. 3 Credits.**PHYS 854. Accelerator Physics. 3 Credits.**

Lecture, 3 hours; 3 credits. Prerequisites: PHYS 601, PHYS 603, and PHYS 704 or PHYS 804. Department approval required. Overview of the underlying physics of modern particle accelerators. Acceleration, beam transport, nonlinear dynamics, coherent synchrotron radiation, wakefields and impedances, collective effects, phase space cooling, free-electron lasers, novel methods of acceleration, accelerator systems.

PHYS 857. Plasma Physics. 3 Credits.**PHYS 859. Classical Mechanics and Electromagnetism in Accelerator Physics. 3 Credits.**

Lecture, 3 hours; 3 credits. Prerequisites: PHYS 601, PHYS 603, and PHYS 704 or PHYS 804. Further development of classical mechanics and electromagnetism and their application to accelerator physics: LaGrangian and Hamiltonian formulation of equations of motion, canonical transformations, adiabatic invariants, linear and nonlinear resonances. Liouville's theorem, solutions of Maxwell's equation in cavities and waveguides, wakefields, radiation and retarded potentials, synchrotron radiation.

PHYS 860. Low Temperature Physics. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: PHYS 604, and PHYS 707 or PHYS 807, and PHYS 721 or PHYS 821. Properties and behavior of materials and systems at low temperature. Bose and Fermi systems, superconductivity, superfluidity, condensates.

PHYS 861. Nuclear Physics. 3 Credits.**PHYS 862. Nuclear Physics. 3 Credits.****PHYS 871. Introduction to Quantum Field Theory. 3 Credits.**

Lecture, 3 hours; 3 credits. Prerequisites: PHYS 842. Quantization of the Klein-Gordon field, interactions in quantum field theory and Feynman diagrams, quantization of the Dirac field, quantization of the electromagnetic field, quantum electrodynamics, renormalization, quantum chromodynamics and asymptotic freedom.

PHYS 898. Doctoral Research. 1-12 Credits.**PHYS 899. Dissertation. 1-9 Credits.**

POLS - Political Science

POLITICAL SCIENCE Courses

POLS 503. First Amendment Freedoms. 3 Credits.

The course deals with the development and practice of conflicting judicial and legal theories concerning our substantive guaranties. Students are asked to act as advocates in developing and substantiating theories of their own.

POLS 510. African American Politics. 3 Credits.

This course examines the political development of Black people in the United States by focusing on the relationship and processes of the American political system. The political dynamics of Black political thought, the Civil Rights Movement, and Black protest politics are also analyzed.

POLS 512. Politics of the Civil Rights Movement. 3 Credits.

Examines the political activities which resulted in the passage of the nation's second Civil Rights policy, the 1960 and 1964 Civil Rights Acts, the 1965 Voting Rights Act and the 1968 Fair Housing Act. The course analyzes the underpinnings, leadership, and political strategies of the Civil Rights Movement.

POLS 514. Politics of Education. 3 Credits.

The question of power, often ignored by education policy analysts and researchers, is a principal focus of this seminar. Issues ranging from the role of education in political socialization and the politics of affirmative action and equal opportunity are examined.

POLS 515. Women and Politics in America. 3 Credits.

Examines women's place in political theory and the practice of politics in the United States. A major focus is to trace the development of women's political rights, the impact of public policy on the lives of American women and to see how women influence and participate in the political process.

POLS 520. Southern Politics. 3 Credits.

This seminar focuses on the politics of the American South from the 1940s to the present. Emphasis is on introducing students to contrasting explanations and analysis about the politics of the American South.

POLS 521. International Law. 3 Credits.

Surveys major areas of public international law (e.g., laws of warfare, law of the sea, conflict resolution, etc.). Emphasizes the relationship between international law and international politics.

POLS 524. International Organization. 3 Credits.

Course provides a basis for understanding the role and importance of international organizations in contemporary international relations. Focuses on development and history of global organizations, with particular emphasis on the United Nations, and regional and functional organizations.

POLS 534. Political Participation in the United States. 3 Credits.

An examination of current theories and research on political behavior, conventional and unconventional modes of political participation, and the impact of participation on the political system.

POLS 535. Chinese Politics. 3 Credits.

A study of origins of the Chinese revolution; development and functions of the Chinese Communist Party; government institutions; the defense establishment; evolution of foreign policy; and post-Mao political and economic reforms.

POLS 536. Japanese Politics. 3 Credits.

A study of Japan's historical political development and social patterns; government institutions; problems of the constitution; and foreign and defense policy.

POLS 537. International Relations in East Asia. 3 Credits.

A study of contemporary issues (political, economic, and strategic) in the East Asia area; the interactions of China, Japan, the United States, and the former Soviet republics in East Asia.

POLS 539. International Relations of African States. 3 Credits.

This course aims to expose students to an examination of the workings of international politics from the viewpoint of Africans and African states. International relations have tended to look at the world from the viewpoint of its most powerful states. Yet, most of the world's states - notably in Africa - are weak but have great potential global impact.

POLS 542. Twentieth Century Dictatorships. 3 Credits.

A study of the Fascist, Nazi, Stalin and Mao regimes and the forces that brought them to power and sustained them, including a study of the impact of their policies on their people and neighboring states.

POLS 555. The Politics of Climate Change. 3 Credits.

An examination of the science of climate change and how United States political actors have responded to this global environmental challenge.

POLS 566. Politics of the Middle East. 3 Credits.

An analysis of the political processes throughout the region and in selected nations of the Middle East. Topics to be discussed include inter-Arab relations, the Arab-Israeli conflict, the Iran-Iraq rivalry and foreign power involvement in the Middle East.

POLS 595. Topics in Political Science. 1-3 Credits.

The advanced study of selected topics which, due to their specialized nature, may not be offered regularly.

POLS 596. Topics in Political Science. 1-3 Credits.

The advanced study of selected topics which, due to their specialized nature, may not be offered regularly.

POLS 597. Independent Research in Political Science. 1-3 Credits.

Independent research in political science under the supervision of a faculty member.

POLS 602. Seminar in American Foreign Policy. 3 Credits.

The formulation and conduct of U.S. foreign policy under changing domestic and external circumstances. Models of decision making; interrelationships of economic, political, and military factors; major trends in contemporary American foreign policy making.

POLS 623. Foreign Policy Analysis. 3 Credits.

Comparative study of foreign policy behavior. Internal and external factors in formation and implementation of foreign policy. Examination and application of foreign policy models.

POLS 624. National Security Policy. 3 Credits.

Examines U.S. national security policy, strategy and the use of force, the formulation and execution of policy, the international dimension of national security, and contemporary issues in national security.

POLS 626. Seminar in Politics of Russia and the Soviet Successor States. 3 Credits.

Power and authority in Russia and the other successor states of the former Soviet Union. Although focusing on Russia, the course embraces the contemporary internal politics of the states in the space between Germany and Japan/China including Central Asia and the Caucasus. Emphasizes research methodology and strategies.

POLS 631. Seminar in Chinese Politics. 3 Credits.

An advanced survey and research on contemporary Chinese politics, political and economic reforms; intellectuals and politics; China's experience of socialist revolution and economic construction; and foreign policy.

POLS 650. Interdependence, Power and Transnationalism. 3 Credits.

This course covers the fundamental concepts, ideas, and approaches to the study of interdependence and transnationalism. It seeks to expose students to the nature, role, and impact of economic, technological, strategic, and cultural interdependence. Cases of interdependence and transnationalism are explored in the post-Cold War era. Some focus is placed on how interdependence and transnationalism are impacting the power of the state. Prerequisites: Permission of director or instructor.

POLS 665. International Political Economy. 3 Credits.

Analysis of the forces shaping national and transnational economic institutions and their policies on a range of contemporary issues, including North-South relations.

POLS 695. Selected Topics in Political Science. 1-3 Credits.

The advanced study of selected topics which, due to their specialized nature, may not be offered regularly.

POLS 696. Selected Topics in Political Science. 1-3 Credits.

The advanced study of selected topics which, due to their specialized nature, may not be offered regularly.

POLS 697. Independent Research in Political Science. 1-3 Credits.

Independent research in political science under the supervision of a faculty member.

PORT - Maritime, Ports and Logistics Management

MARITIME PORTS LOGISTICS MGMT Courses

PORT 610. International Shipping and Supply Chain Management. 3 Credits.

Examines international freight transportation and terms for movement of international trade; focuses on improving supply chain relationships in the movement of international trade/directing the flow of information, materials and products. (cross-listed with MSCM 610).

PORT 611. International Maritime Transport. 3 Credits.

Examines the international business of shipping, commercial processes, maritime-related organizations, shipbuilding and repair, ship types and fleets, and commodity movement. Prerequisites: an undergraduate course in the international field such as MGMT 361, MGMT 462, or a similar graduate course.

PORT 612. Port Operations and Management. 3 Credits.

Covers role, functions, and types of international terminals and ports, including design and operation of general and specialized cargo handling facilities and offshore systems, port authorities, operational structures, and labor. Prerequisites: a graduate course in management such as MGMT 602 and a course in operations management.

PORT 613. International Maritime and Admiralty Law. 3 Credits.

International law of the sea, maritime jurisdiction, regulation of shipping, carriage of goods, marine insurance, salvage, marine environmental law, safety at sea, and the Oil Pollution Act of 1990 are covered, along with other maritime laws. Prerequisites: a basic law course.

PORT 614. Port Planning and Economics. 3 Credits.

Port planning and competition, ports and ocean container shipping, port impacts, port users in theory, port operator costing and pricing, port carriers and shippers, government and maritime institutions, dockworkers, port environment and port performance evaluation. Prerequisites: a course in microeconomics such as ECON 604.

PORT 615. Maritime Security and Risk Analysis. 3 Credits.

An overview of international and U.S initiatives to ensure the security of vessels, cargo, people, and infrastructure within the maritime domain. In addition to the impacts of regulatory requirements on maritime commerce, the course also addresses maritime threats to the international economy (including maritime piracy and maritime terrorism), maritime coalitions, and state-of-the-art techniques and tools for safeguarding oceanborne commerce. (cross-listed with MSCM 615).

PORT 616. Supply Chain and Reverse Logistics. 3 Credits.

This course explores theories of global Supply Chain and Reverse Logistics systems as well as the practices, risks and opportunities found in today's systems. Fundamental tools and techniques will be used to provide insights on how to best organize, manage, and optimize such systems.(cross-listed with MSCM 616).

PORT 617. Transportation Intermediaries. 3 Credits.

An overview of the document, role and functions of transportation intermediaries. The relationships between intermediaries, carriers and shippers are discussed as well as the major intermediaries and their competitive strategies. The customers of various international trade and supply chains of intermediaries are also discussed. (cross-listed with MSCM 617).

PORT 618. Shipbuilding and Ship Repair Business Management. 3 Credits.

Examines the shipbuilding and ship repair industry from the perspective of industry economics, industry financial management and repair operations and acquisition processes. Provides industry professionals with business management practices that shape the industry.

PORT 619. Marine Insurance. 3 Credits.

Examines the rise of Lloyd's and the London Insurance Market, the current maritime insurance market, principles of insurance and law, Hull Insurance Law, cargo insurance, general average and salvage insurance.

PORT 668. Directed Research/Port Internship. 1-3 Credits.

1-3 credits. Prerequisites: PORT 611, 612, 613, and 614. Practical field experience in international maritime, ports and logistics related challenges through supervised investigation and analysis of a problem or a working internship within the port-related arena.

PORT 695. Selected Topics in Maritime and Port Management. 3 Credits.

3 credits. Prerequisites: PORT 611 or 612. The advanced study of selected topics not offered on a regular basis.

PORT 697. Independent Study. 3 Credits.

3 credits. Designed to provide the opportunity for independent study under the guidance of a member of the faculty.

PPCM - Public Procurement and Contract Management

PUBLIC PROCUREMENT AND CONTRACT MANAGEMENT Courses

PPCM 672. Public Financial Management. 3 Credits.

Examination of public sector financial management principles, practices and processes. Emphasis on financial auxiliary services employed in local government financial management. Introduction to governmental accounting practices and financial statements. Micro-computer applications to public sector financial decision-making techniques. (Cross listed with PADM 672).

PPCM 704. Methods of Public Program Evaluation. 3 Credits.

Examination of various methodologies for designing and conducting program evaluation and research. Experimental, quasi-experimental and nonexperimental procedures will be covered. (Cross listed with PADM 704).

PPCM 714. Public-Private Partnerships. 3 Credits.

An in-depth analysis of the forces behind the privatization movement. Examines the context of privatization, the theoretical and empirical arguments on both sides of the debate, and the different forms of privatization practiced in the U.S. The course draws on a wide range of disciplines in a quest for an understanding of the privatization phenomenon—political science, public administration, public policy, sociology, economics, management, and others. (Cross listed with PADM 714).

PPCM 718. Public Sector Contract Administration. 3 Credits.

Examines the actions that must be taken following the award of a contract, including assurance of required outcomes, assurance of compliance, proper contract launch, proper contract close-out, and documentation and carrying forward lessons learned. Connections to steps that must be taken in the other two phases of the procurement process are noted. (Course is cross listed with PADM 718.).

PPCM 719. Leadership. 3 Credits.

Examines leadership through theoretical and practice-based frameworks. Offers analytical and intellectual examination and reflection on core issues in the practice of leadership. These objectives will be achieved through open discussion, honest self-assessment, experiential exercises, and observation of real-life leadership practice. (Cross listed with PADM 719).

PPCM 726. Introduction to Public Procurement. 3 Credits.

This course provides an overview of procurement and contract management as a core function in public sector organizations. The course introduces the student to how properly-aligned, best practice acquisitions can support public entities' strategic goals. Challenges and opportunities for all stakeholders are addressed. Special attention is given to ongoing changes in public procurement. (Cross listed with PADM 726).

PPCM 727. Public Procurement and Project Management. 3 Credits.

Course covers each phase of the public procurement project cycle, with an emphasis on tools and techniques to manage a public procurement project. (Cross listed with PADM 727).

PPCM 728. Public Sector Contract Planning and Formation. 3 Credits.

This course provides insight into why and how public sector contracts should be planned and formed properly. A strong emphasis is placed on the strategic role that procurement can play in public sector organizations and how procurement planning and source selection, in particular, fit into that role. (Cross listed with PADM 728).

PPCM 731. Public Sector Procurement Law and Ethics. 3 Credits.

This course surveys the laws and ethics applicable to public sector procurement and contract management. A theoretical and problem-based, interdisciplinary approach is used to address the major legal and ethical issues that arise when public sector organizations plan, form, and administer contracts. Attention is given to the role of professionalization in socializing appropriate ethics. (Cross listed with PADM 731).

PPCM 734. Negotiation and Dispute Resolution. 3 Credits.

The course provides conceptual and practical skills in negotiations. It examines the underlying cultural, legal, and organizational issues and problems that affect managing human resources in the workplace. (Cross listed with PADM 734).

PPCM 781. Intergovernmental Management. 3 Credits.

Analysis of relationships among federal, state, and local governmental units in the delivery of governmental programs. Focus on intergovernmental issues in urban metropolitan regions. (Cross listed with PADM 781).

PRTS – Parks, Recreation and Tourism Studies

PARKS, RECREATION AND TOURISM STUDIES Courses

PRTS 561. The Tourism and Hospitality Industry. 3 Credits.

This course explores tourism from a social perspective. The focus of the course will be on economic and social dimensions of tourism, tourism development strategies, and current research in hospitality from national and international case studies. Prerequisites: permission of instructor.

PRTS 575. Tourism and Cultural Heritage Management. 3 Credits.

This course examines the principles and practices of planning, marketing, and managing cultural tourism. Assessment, development, and maintenance of cultural tourism products are explored.

PRTS 595. Topics. 1-3 Credits.

This course provides an opportunity for in-depth study of selected topics in the variety of areas comprising parks, recreation and tourism studies.

PRTS 619. Strategic Marketing in Parks, Recreation and Tourism. 3 Credits.

Course is designed to examine the principles and practices of strategic marketing as it pertains to tourism planning and development. The course will explore market analysis in segmenting and identifying specified tourist markets.

PRTS 638. Fiscal Planning and Management in Sport and Recreation. 3 Credits.

This course is designed to examine the principles and practices of financial management in diverse sport and recreation service settings. This course will explore the basic concepts of financial planning and analysis required to effectively manage a successful operation. (cross-listed with SMGT 638).

PRTS 650. Readings in Contemporary Issues in Recreation, Sport, Health and Physical Education. 3 Credits.

Literature and research on ethical issues in sport, recreation, and wellness settings. Emphasis will be placed on administrative ethical decision-making skills and practices.

PRTS 660. Legal Aspects of Sport. 3 Credits.

Course will introduce students to various aspects of the legal system as it relates to the management and supervision of recreation and sport facilities, programs, participants, spectators and events.

PSYC - Psychology

PSYCHOLOGY Courses

PSYC 651. Developmental Psychology. 3 Credits.

Lecture and discussion 3 hours; 3 credits. This course covers topics related to the physical, cognitive, social and emotional aspects of growth, from conception to death. It focuses on human growth and development, but other organisms are also considered.

PSYC 653. Personality Psychology: Theory and Research. 3 Credits.

Lecture and discussion 3 hours; 3 credits. The course deals with basic issues and contemporary topics in personality research. The basic issues covered include personality measurement, heredity, biological approaches, personality development, and motives. Current topics in personality research that are covered include the unconscious, personal efficacy, sex and gender, control, self-concept, stress and illness, sexuality, and disorders of personality.

PSYC 661. Psychopathology. 3 Credits.

The course provides a conceptual basis for the study of abnormal behavior. Students conduct an in-depth review of the literature related to the classification, etiology, and treatment of mental disorders.

PSYC 662. Human-Computer Interface Design. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: graduate standing and permission of the instructor. Course introduces students to the fundamental principles of human-computer interaction. Exposes students to basic psychological concepts and shows how they are used to create effective interface designs. Covers both theoretical and practical aspects of interface design.

PSYC 663. Intellectual Assessment. 3 Credits.

Lecture and discussion 3 hours; 3 credits. Primary focus is on intellectual assessment for children and adults. Basic instruction in administration and interpretation of standard tests of intelligence will be provided. Additional topics include tests of achievement and memory function.

PSYC 664. Personality Assessment. 3 Credits.

Lecture and discussion 3 hours; 3 credits. Course covers major methods of personality assessment including objective and projective instruments. Emphasis is on current theory and applications of personality assessment.

PSYC 667. Practicum in Psychology. 2-5 Credits.

2-5 credits. Prerequisites: 15 graduate course hours (including PSYC 663) and permission of the instructor. Students will receive supervised training in an applied setting in the area of clinical or industrial psychology.

PSYC 696. Topics in Psychology. 3 Credits.**PSYC 697. Selected Topics in Psychology. 1-4 Credits.**

1-3 credits. Prerequisites: permission of the instructor and graduate program director. This course provides opportunities for advanced investigations of selected topics in psychology. May be taken by students beyond the first year of graduate study who wish to pursue topics not covered by regularly scheduled courses.

PSYC 698. Research in Psychology. 3 Credits.

3 credits. Individual project under guidance of a research advisor. Required for students choosing thesis option. Limited to a total of 3 hours of credit.

PSYC 699. Thesis. 1-3 Credits.

1-3 credits. Prerequisite: PSYC 698. Individual project under guidance of a research advisor. Required for students choosing thesis option.

PSYC 712. History and Systems of Psychology. 3 Credits.

Lecture and discussion 3 hours; 3 credits. A survey of the historical roots of modern psychology.

PSYC 713. Research Fundamentals. 2 Credits.

Lecture 2 hourS; 2 credit. This course will cover Responsible Conduct of Research, including completion of CITI course, protection of human subjects, University Human Subjects Committee and IRB, APA Style, paper structure, references, tables, figures, etc., research proposal writing, including searching for sources, writing, oral presentation, data collection and management issues, (e.g., Inquisite, SONA, data cleaning). Students are required to complete a Research Proposal with Introduction and Methods and Data Analysis Plan. Oral presentation of research proposal.

PSYC 722. Occupational Health Psychology. 3 Credits.

Lecture, 3 hours; 3 credits. Prerequisite: PSYC 763/863 and PSYC 850. This course examines multidisciplinary research and theories on issues related to individual and organizational well-being and health. Occupational health psychology (OHP) emphasizes the promotion of wellness and the prevention of injuries and illnesses in the workplace. Through lectures/presentations, discussions, and research activities, students will learn about OHP theory and practice.

PSYC 727. Analysis of Variance and Experimental Design. 4 Credits.

4 credits; 3 Lecture hours; 2 Lab hours. Prerequisite: admission into the psychology M.S. or Ph.D. program or permission of the instructor. Review of the basic descriptive and inferential statistical procedures with a heavy emphasis on fundamental and advanced analysis of variance techniques. Topics include contrasts, factorial designs, within-subject and mixed designs, and analysis of covariance. Course materials are covered in the context of classical experimental and quasi-experimental design.

PSYC 728. Regression and Correlational Design. 4 Credits.

Lecture 3 hours; Lab 2 hours; 4 credits. Prerequisite: admission into the psychology M.S. or Ph.D. program or permission of the instructor and PSYC 727/827 or equivalent. Course covers correlation with heavy emphasis on regression analysis in the context of the general linear model. Topics include partial correlations, categorical and continuous interactions, non-linear regression, and multivariate statistics. Course materials are covered in the context of correlational designs and survey research.

PSYC 730. Teaching Statistics and Research Practicum. 1,3 Credit.

1 or 3 credits. Prerequisites: PSYC 727 or 824 or 827 and PSYC 728 or 825 or 828. Advanced graduate students in Psychology will have the opportunity to direct statistics and research methods labs for graduate statistics courses. Students' main role will be acting as peer mentors for the new graduate students. Other possible responsibilities may include grading, creating lab activities and assignments, and supervising students' research projects. Students will be evaluated on their teaching effectiveness and performance.

PSYC 731. Human Cognition. 3 Credits.

Lecture and discussion 3 hours; 3 credits. Prerequisite: admission into the psychology M.S. or Ph.D. program or permission of the instructor. An investigation of the ways in which people process and retain information, make decisions, and solve problems. Current models of structures and processes of human memory and cognition are discussed with particular emphasis on neurocognitive evidence of the brain mechanisms involved in cognition.

PSYC 735. Health Psychology. 3 Credits.

Lecture 3 hours; 3 credits. This course focuses on contemporary theory and research topics in health psychology. The course examines psychological and behavioral issues affecting health maintenance, coping with life-threatening illnesses and chronic diseases, and health promotion. The course uses the biopsychosocial (mind-body) model as an organizing framework, emphasizing the dynamic interactions among biological, social, personality, and behavioral factors jointly in influencing people's health. The course is conducted as a seminar.

PSYC 736. Multilevel Models: HLM. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite PSYC 728/828 or equivalent. Social science data frequently have a hierarchical or multilevel structure as a consequence of sampling designs or repeated measures. The purpose of the course is to introduce students to the basic principles and applications of hierarchical linear modeling in social science research. Topics covered include an introduction to multilevel analyses, random intercept models, random slope models, hypotheses testing, hierarchical models for limited dependent variables, model fitting, three-level models, and repeated-measures applications.

PSYC 740. Quasi-Experimental Methods. 3 Credits.

Lecture, 3 hours. 3 credits. Quasi-experimental methods is a course to teach techniques for research designs not conducive to randomized-control trials. The philosophy of these techniques, issues of validity, and analyses are discussed. Comparisons with randomized-control trials as well as means to strengthen quasi-methodologies for better general causal inferences are presented.

PSYC 741. Sensation and Perception. 3 Credits.

Lecture and discussion 3 hours; 3 credits. A survey of human sensation and perception emphasizing historical contributions, recent theoretical and methodological developments, and empirical findings.

PSYC 744. Program Evaluation. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: 727/827 and 728/828 (or current enrollment). This course is designed to introduce students to the field of program evaluation as well as to give students practical experience conducting a program evaluation. Students will get experience creating and conducting qualitative and quantitative assessments. A course goal is to work in small groups to conduct a program evaluation.

PSYC 745. Psychometric Theory. 3 Credits.

Lecture and discussion 3 hours; 3 credits. Prerequisite: PSYC 728/828 or equivalent. This course introduces classical test theory, including definitions and formulas for test reliability, standard error of measurement, and related statistics. Additional topics include scaling, test validity, item statistics useful in test constructions, and norms commonly used in educational and psychological testing. Generalizability Theory, factor analysis, and Item Response Theory (IRT) are introduced.

PSYC 746. Structural Equation Modeling. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: PSYC 745/845 or equivalent. This course covers the topics of linear structural equation modeling and focuses on estimation, measurement models, confirmatory and hierarchical factor analysis, structural equations, longitudinal models, multisample analyses, and mean structures.

PSYC 747. Multivariate Methods for the Social/Behavioral Sciences. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: PSYC 728/828 or equivalent. The course is focused on methods and techniques for analyzing multivariate data. Emphasis includes both conceptual and computational aspects of the most commonly used analytical tools when experimental units have multiple measures. A goal of the course is to avoid the extremes of “plug n chug” analyses on the one hand and theorems and proofs on the other to provide generalizable working knowledge of multivariate statistics. Featured techniques are MANOVA, MANCOVA, profile analysis, discriminant analysis, canonical correlation, principal components analysis, and exploratory factor analysis.

PSYC 748. Categorical Methods for the Social/Behavioral Sciences. 3 Credits.

Lecture, 3 hours; 3 credits. Prerequisite: PSYC 727/827 or PSYC 728/828. The purpose of this course is to review the linear regression model and move into categorical methods. Featured methods are inference using proportions and odds ratios, multi-way contingency tables, logistic regression, and loglinear models. The generalized linear model is also introduced.

PSYC 749. Advanced Social Psychology. 3 Credits.

Lecture and discussion 3 hours; 3 credits. This course discusses the behavior of the human as a member of a group. Topics include attitude theory and change, interpersonal attraction, group dynamics, and related theory and applied research techniques.

PSYC 750. Organizational Psychology. 3 Credits.

Lecture and discussion 3 hours; 3 credits. This course provides an overview of organizational behavior and theory. Topics include leadership, motivation, teams, social processes at work, workplace relationships, organization structure and environments, and organizational development and change.

PSYC 763. Personnel Psychology. 3 Credits.

Lecture and discussion 3 hours; 3 credits. This course provides an overview of personnel psychology. Topics include reliability and validity, job analysis, performance criteria, performance appraisal, employee recruitment, employee selection, and training and development.

PSYC 770. Human Factors Psychology. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisites: PSYC 731/831 and 741/841 or equivalents or permission of the instructor. The application and evaluation of psychological principles and research relating human behavior to the design of tools, technology, and the work environment. Theory, methods, and application are emphasized.

PSYC 771. Ergonomics. 3 Credits.

Lecture 3 hours; 3 credits. Basic overview and application of anthropometry, biomechanics, functional anatomy, mechanics, and human physiology for the design of industrial tools, equipment, and workstations.

PSYC 780. Ethics, Professional Standards, and Responsible Conduct. 3 Credits.

Lecture, 3 hours; 3 credits. Ethical principles, APA codes, laws, policies and approaches to ethical decision making will be applied to case studies involving dilemmas and issues in several areas of the professional activities of psychologists. Students will prepare an ethical and/or professional issue paper and a self-reflection on acculturation into professional ethics and standards.

PSYC 781. Advanced Ergonomics. 3 Credits.

Lecture, 3 hours; 3 credits. Basic overview of the application of anthropometry, biomechanics, ergonomics, cognition and perception within workplace environments. Particular focus on the analysis and prevention of accidents at work. Course requires considerable practice in technical writing.

PSYC 792. Advanced Seminar in Physiological Psychology. 3 Credits.

Lecture 3 hours; 3 credits. Students will investigate the biological underpinnings of behavior and explore what is currently known about their role in movement, emotions, mental illness, sexual behavior, memory, states of consciousness, sensory perception, thought and language, and several neuro-psychiatric disorders. Through active learning exercises, i.e., class discussion, reports, critiques, oral presentations, and a final research paper or proposal, students will apply and demonstrate their acquired knowledge and critical thinking skills to the biological basis of human behavior.

PSYC 795. Topics in Psychology I. 1-4 Credits.**PSYC 796. Topics in Psychology II. 1-4 Credits.****PSYC 801. Empirically-Supported Therapies. 3 Credits.**

Lecture, 3 hours; 3 credits. Empirically-Supported Therapies is designed to foster the integration of clinical science and the practice of psychotherapy. Course objectives include learning how to identify, evaluate, and implement empirically supported interventions for various psychological disorders.

PSYC 810. Seminar in Professional Aspects of Industrial/Organizational Psychology. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: admission into the I/O Ph.D. program. Topics covered include standards of professional behavior of I/O psychologists, the governance of psychology, I/O psychology professional associations, and professional opportunities for I/O psychologists.

PSYC 812. History and Systems of Psychology. 3 Credits.

Lecture and discussion 3 hours; 3 credits. A survey of the historical roots of modern psychology.

PSYC 813. Research Project I. 2 Credits.

Lecture 2 hours; 2 credits. This course will cover Responsible Conduct of Research, including completion of CITI course, protection of human subjects, University Human Subjects Committee and IRB, APA Style, paper structure, references, tables, figures, etc., research proposal writing, including searching for sources, writing, oral presentation, data collection and management issues, (e.g., Inquisite, SONA, data cleaning). Students are required to complete a Research Proposal with Introduction and Methods and Data Analysis Plan. Oral presentation of research proposal.

PSYC 815. Teaching Psychology. 1 Credit.

Lecture and discussion 1 hour; 1 credit. Seminar on the pedagogy of teaching as applied to the discipline of psychology. Topics include syllabus preparation, lecture and discussion methods, assessment and grading, and teaching portfolio development.

PSYC 822. Occupational Health Psychology. 3 Credits.

Lecture, 3 hours; 3 credits. Prerequisite: PSYC 763/863 and PSYC 850. This course examines multidisciplinary research and theories on issues related to individual and organizational well-being and health. Occupational health psychology (OHP) emphasizes the promotion of wellness and the prevention of injuries and illnesses in the workplace. Through lectures/presentations, discussions, and research activities, students will learn about OHP theory and practice.

PSYC 824. ODU-Research Methods I-Analysis of Variance and Experimental Design. 4 Credits.

Review of basic descriptive and inferential statistical procedures with a heavy emphasis on fundamental and advanced analysis of variance techniques. Topics include contrasts, factorial designs, within-subject and mixed designs, and analysis of covariance. Course materials are covered in the context of classical experimental and quasi-experimental design. Prerequisites: admission into Virginia Consortium PhD in Clinical Psychology program or permission of the instructor.

PSYC 825. ODU Research Methods II: Regression and Correlational Design. 4 Credits.

Course covers correlation with heavy emphasis on regression analysis in the context of the general linear model. Topics include partial correlations, categorical and continuous interactions, non-linear regression, and multivariate statistics. Course materials are covered in the context of correlational designs and survey research. Prerequisites: admission into Virginia Consortium PhD in Clinical Psychology or permission of the instructor.

PSYC 827. Analysis of Variance and Experimental Design. 4 Credits.

4 credits; 3 Lecture hours; 2 Lab hours. Prerequisite: admission into the psychology M.S. or Ph.D. program or permission of the instructor. Review of the basic descriptive and inferential statistical procedures with a heavy emphasis on fundamental and advanced analysis of variance techniques. Topics include contrasts, factorial designs, within-subject and mixed designs, and analysis of covariance. Course materials are covered in the context of classical experimental and quasi-experimental design.

PSYC 828. Regression and Correlational Design. 4 Credits.

Lecture 3 hours; Lab 2 hours; 4 credits. Prerequisite: admission into the psychology M.S. or Ph.D. program or permission of the instructor and PSYC 727/827 or equivalent. Course covers correlation with heavy emphasis on regression analysis in the context of the general linear model. Topics include partial correlations, categorical and continuous interactions, non-linear regression, and multivariate statistics. Course materials are covered in the context of correlational designs and survey research.

PSYC 830. Teaching Statistics and Research Practicum. 1,3 Credit.

1 or 3 credits. Prerequisites: PSYC 727 or 824 or 827 and PSYC 728 or 825 or 828. Advanced graduate students in Psychology will have the opportunity to direct statistics and research methods labs for graduate statistics courses. Students' main role will be acting as peer mentors for the new graduate students. Other possible responsibilities may include grading, creating lab activities and assignments, and supervising students' research projects. Students will be evaluated on their teaching effectiveness and performance.

PSYC 831. Human Cognition. 3 Credits.

Lecture and discussion 3 hours; 3 credits. Prerequisite: admission into the psychology M.S. or Ph.D. program or permission of the instructor. An investigation of the ways in which people process and retain information, make decisions, and solve problems. Current models of structures and processes of human memory and cognition are discussed with particular emphasis on neurocognitive evidence of the brain mechanisms involved in cognition.

PSYC 833. Grant and Manuscript Writing. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: admission to the doctoral program in psychology and completion of master's thesis, or permission of instructor. The course is designed: (1) to teach students to write article-length scholarly manuscripts in APA format of publishable quality, and (2) to teach students the critical components of grant applications. By the end of this course, each student will have prepared a manuscript that is ready for submission to a peer-reviewed journal and have completed sections of a federal grant application.

PSYC 835. Health Psychology. 3 Credits.

Lecture 3 hours; 3 credits. This course focuses on contemporary theory and research topics in health psychology. The course examines psychological and behavioral issues affecting health maintenance, coping with life-threatening illnesses and chronic diseases, and health promotion. The course uses the biopsychosocial (mind-body) model as an organizing framework, emphasizing the dynamic interactions among biological, social, personality, and behavioral factors jointly in influencing people's health. The course is conducted as a seminar.

PSYC 836. Multilevel Models: HLM. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite PSYC 728/828 or equivalent. Social science data frequently have a hierarchical or multilevel structure as a consequence of sampling designs or repeated measures. The purpose of the course is to introduce students to the basic principles and applications of hierarchical linear modeling in social science research. Topics covered include an introduction to multilevel analyses, random intercept models, random slope models, hypotheses testing, hierarchical models for limited dependent variables, model fitting, three-level models, and repeated-measures applications.

PSYC 840. Quasi-Experimental Methods. 3 Credits.

Lecture, 3 hours. 3 credits. Quasi-experimental methods is a course to teach techniques for research designs not conducive to randomized-control trials. The philosophy of these techniques, issues of validity, and analyses are discussed. Comparisons with randomized-control trials as well as means to strengthen quasi-methodologies for better general causal inferences are presented.

PSYC 841. Sensation and Perception. 3 Credits.

Lecture and discussion 3 hours; 3 credits. A survey of human sensation and perception emphasizing historical contributions, recent theoretical and methodological developments, and empirical findings.

PSYC 844. Program Evaluation. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: 727/827 and 728/828 (or current enrollment). This course is designed to introduce students to the field of program evaluation as well as to give students practical experience conducting a program evaluation. Students will get experience creating and conducting qualitative and quantitative assessments. A course goal is to work in small groups to conduct a program evaluation.

PSYC 845. Psychometric Theory. 3 Credits.

Lecture and discussion 3 hours; 3 credits. Prerequisite: PSYC 728/828 or equivalent. This course introduces classical test theory, including definitions and formulas for test reliability, standard error of measurement, and related statistics. Additional topics include scaling, test validity, item statistics useful in test constructions, and norms commonly used in educational and psychological testing. Generalizability Theory, factor analysis, and Item Response Theory (IRT) are introduced.

PSYC 846. Structural Equation Modeling. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: PSYC 745/845 or equivalent. This course covers the topics of linear structural equation modeling and focuses on estimation, measurement models, confirmatory and hierarchical factor analysis, structural equations, longitudinal models, multisample analyses, and mean structures.

PSYC 847. Multivariate Methods for the Social/Behavioral Sciences. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: PSYC 728/828 or equivalent. The course is focused on methods and techniques for analyzing multivariate data. Emphasis includes both conceptual and computational aspects of the most commonly used analytical tools when experimental units have multiple measures. A goal of the course is to avoid the extremes of "plug n chug" analyses on the one hand and theorems and proofs on the other to provide generalizable working knowledge of multivariate statistics. Featured techniques are MANOVA, MANCOVA, profile analysis, discriminant analysis, canonical correlation, principal components analysis, and exploratory factor analysis.

PSYC 848. Categorical Methods for the Social/Behavioral Sciences. 3 Credits.

Lecture, 3 hours; 3 credits. Prerequisite: PSYC 727/827 or PSYC 728/828. The purpose of this course is to review the linear regression model and move into categorical methods. Featured methods are inference using proportions and odds ratios, multi-way contingency tables, logistic regression, and loglinear models. The generalized linear model is also introduced.

PSYC 849. Advanced Social Psychology. 3 Credits.

Lecture and discussion 3 hours; 3 credits. This course discusses the behavior of the human as a member of a group. Topics include attitude theory and change, interpersonal attraction, group dynamics, and related theory and applied research techniques.

PSYC 850. Organizational Psychology. 3 Credits.

Lecture and discussion 3 hours; 3 credits. This course provides an overview of organizational behavior and theory. Topics include leadership, motivation, teams, social processes at work, workplace relationships, organization structure and environments, and organizational development and change.

PSYC 851. Micro Organizational Psychology. 3 Credits.

Lecture and discussion 3 hours; 3 credits. Prerequisite: PSYC 750/850 or permission of the instructor. This seminar discusses models and theories in organizations. Emphasis is placed on classic and contemporary leadership and motivation theory and research.

PSYC 853. Macro Organizational Psychology. 3 Credits.

Lecture and discussion 3 hours; 3 credits. This class uses a multilevel perspective to provide a foundation in organization theory. Students develop a theory of organizing that incorporates variables at the individual, dyad group, unit organization, and organization network levels of analysis.

PSYC 854. Organizational Development and Change. 3 Credits.

Lecture and discussion 3 hours; 3 credits. Prerequisites: PSYC 851 and 853 or permission of the instructor. This seminar discusses models and theories of organizational change and interventions that are commonly used to foster organizational development and effectiveness. Students participate in an organizational consulting project to apply lessons learned in the classroom.

PSYC 855. Field Research Methods in Organizational Psychology. 3 Credits.

Lecture, discussion, and field research project; 3 credits. Prerequisite: admission into the I/O Ph.D. program or permission of the instructor. This seminar discusses the design and analysis of surveys, quasi-experiments, questionnaires, interviews and other methods for studying organizational processes. Both quantitative and qualitative research methods are discussed.

PSYC 858. ODU Clinical and Ethical Issues. 1 Credit.

Lecture 1 hour; 1 credit. Weekly seminars address professional and ethical issues in the practice of clinical psychology.

PSYC 859. ODU-Cognitive and Behavioral Therapies. 3 Credits.

Lecture 3 hours; 3 credits. Covers theory and techniques of cognitive and behavioral approaches. Applications for the assessment and treatment of adults, children, couples, and families are discussed. Students gain practical experience in these techniques as well as case conceptualization skills.

PSYC 860. ODU Practicum in Clinical Psychology. 3 Credits.**PSYC 861. ODU Advanced Practicum in Clinical Psychology. 3-6 Credits.****PSYC 862. ODU Psychodynamic Therapy. 3 Credits.****PSYC 863. Personnel Psychology. 3 Credits.**

Lecture and discussion 3 hours; 3 credits. This course provides an overview of personnel psychology. Topics include reliability and validity, job analysis, performance criteria, performance appraisal, employee recruitment, employee selection, and training and development.

PSYC 864. Human Resource Development. 3 Credits.

Lecture and discussion 3 hours; 3 credits. Prerequisite: PSYC 763/863 or permission of the instructor. This course covers research findings, methodologies, and evaluation designs for the training and development of personnel in organizations. Specific topics include needs assessment, learning principles and system design.

PSYC 865. Psychology of Personnel Selection. 3 Credits.

This course covers the topics of recruitment, job performance, interviews, internet-based testing, and psychological constructs for use in employee selection (e.g., intelligence, personality). Prerequisite: PSYC 763/PSYC 863 or permission of the instructor.

PSYC 866. Advanced Personnel Psychology II. 3 Credits.

Lecture and discussion 3 hours; 3 credits. Prerequisite: PSYC 865 or permission of the instructor. This course covers statistical and theoretical issues related to the research and practice of personnel psychology, including meta-analysis, significance testing, aggregation issues, scale development and validation, utility, the fairness and bias of tests, and the legal context of selection.

PSYC 867. Human Performance Assessment. 3 Credits.

Lecture and discussion 3 hours; 3 credits. Prerequisites: PSYC 763/863 or permission of the instructor. This course covers the job analysis and performance appraisal/management (PA/MA). Specific topics include job analysis methods; use of job analysis results for various HR functions; performance assessment/appraisal methods; multi-source feedback; employee reactions to and use of PA/MA information; rater cognitive processes and affect; rater goals, bias, and accuracy; and organizational practical and legal issues surrounding job analysis and PA/MA.

PSYC 870. Human Factors Psychology. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisites: PSYC 731/831 and 741/841 or equivalents or permission of the instructor. The application and evaluation of psychological principles and research relating human behavior to the design of tools, technology, and the work environment. Theory, methods, and application are emphasized.

PSYC 871. Ergonomics. 3 Credits.

Lecture 3 hours; 3 credits. Basic overview and application of anthropometry, biomechanics, functional anatomy, mechanics, and human physiology for the design of industrial tools, equipment, and workstations.

PSYC 872. Methods, Measures, Techniques, and Tools in Human Factors. 3 Credits.

Lecture 3 hours; 3 credits. Experiential survey of methods, measures, techniques, and prototyping tools available for human factors investigations in laboratory and field settings. The design and execution of experimental investigations utilizing the measures and tools are emphasized.

PSYC 873. ODU Biological Bases of Behavior. 3 Credits.**PSYC 874. ODU Biological Bases III: Drugs and Behavior. 3 Credits.**

Lecture 3 hours; 3 credits. This course deals with substance abuse disorders, identification/diagnosis, etiology, treatment and recovery. It also covers the proper use of and desired effects and side effects of medications used in the treatment of psychiatric disorders.

PSYC 875. Advanced Visual Perception and Visual Displays. 3 Credits.

Lecture 3 hours; 3 credits. Detailed review of the physiological bases of visual perception, the capabilities and limitations of the visual systems, and the metrics involved in vision research. A survey of current advanced visual displays is presented, stressing the interaction of the characteristics of these displays with the capabilities and limitations of the human visual system.

PSYC 876. Human-Computer Interaction. 3 Credits.

Lecture 3 hours; 3 credits. Review of the physical, cognitive, and performance capabilities and limitations of humans as they interact with modern computer systems. Emphasis is placed on the tools, techniques and procedures for the assessment and effective design of computer hardware, software and displays of information.

PSYC 877. Theories, Models and Simulations in Human Factors. 3 Credits.

Lecture 3 hours; 3 credits. Survey of the historical and philosophical bases for the use of theories, models, and simulations in human factors applications with a critical evaluation of existing theories, mathematical and cognitive models, and simulations in terms of actual and potential contributions to the field.

PSYC 878. Advanced Cognition and Information Processing. 3 Credits.

Lecture 3 hours; 3 credits. Historical survey of human information processing literature, detailed review of recent developments in cognitive psychology, and examination of the purposes, role and scope of cognitive engineering.

PSYC 879. Careers. 3 Credits.

Lecture, 3 hours; 3 credits. Prerequisites: PSYC 750/850 and PSYC 851 or permission of instructor. This course covers the developmental processes, facilitators, and barriers individuals encounter in their work lives. It provides a theoretical foundation in the careers literature and introduces contemporary research in the area. Work-family conflict, mentoring, organizational socialization, and career success are among the topics covered.

PSYC 880. Ethics, Professional Standards, and Responsible Conduct. 3 Credits.

Lecture, 3 hours; 3 credits. Ethical principles, APA codes, laws, policies and approaches to ethical decision making will be applied to case studies involving dilemmas and issues in several areas of the professional activities of psychologists. Students will prepare an ethical and/or professional issue paper and a self-reflection on acculturation into professional ethics and standards.

PSYC 881. Advanced Ergonomics. 3 Credits.

Lecture, 3 hours; 3 credits. Basic overview of the application of anthropometry, biomechanics, ergonomics, cognition and perception within workplace environments. Particular focus on the analysis and prevention of accidents at work. Course requires considerable practice in technical writing.

PSYC 882. Attention and Human Performance. 3 Credits.

Lecture, 3 hours; 3 credits. Prerequisite: PSYC 870. Survey of theories of attention, factors that influence human performance, and human performance assessment in human-machine systems. Topics include dual-task performance, vigilance, workload, arousal, fatigue, stress, human error, psychophysiology, and neuroergonomics.

PSYC 883. Research in Clinical Psychology. 3 Credits.

Individual second-year clinical research project under guidance of research advisor. Prerequisites: PSYC 713 or PSYC 813.

PSYC 890. ODU Internship in Clinical/Community Psychology. 4 Credits.

4 credits each semester for 3 semesters. Prerequisite: Permission of the clinical director. Must be enrolled in psychology doctorate program.

PSYC 891. Industrial/Organizational Internship. 1 Credit.

PSYC 892. Advanced Seminar in Physiological Psychology. 3 Credits.

Lecture 3 hours; 3 credits. Students will investigate the biological underpinnings of behavior and explore what is currently known about their role in movement, emotions, mental illness, sexual behavior, memory, states of consciousness, sensory perception, thought and language, and several neuro-psychiatric disorders. Through active learning exercises, i.e., class discussion, reports, critiques, oral presentations, and a final research paper or proposal, students will apply and demonstrate their acquired knowledge and critical thinking skills to the biological basis of human behavior.

PSYC 894. ODU Clinical Dissertation. 1-6 Credits.

1-6 credits each semester for variable credit.

PSYC 895. Topics in Psychology I. 1-4 Credits.

PSYC 896. Topics in Psychology II. 1-4 Credits.

PSYC 897. Individual Study (Readings). 1-4 Credits.

PSYC 898. Research. 3 Credits.

PSYC 899. Dissertation. 1-9 Credits.

1-9 credits per semester with limitation of a total of 24 credits. The following courses are Clinical Psychology Doctorate courses and require enrollment in that program or permission of the clinical director.

PSYC 999. PSYC 999. 1 Credit.

1 credit. A one-hour pass/fail registration required of all graduate students to maintain active status during the final semester prior to graduation. After successfully passing the candidacy examination, all doctoral students are required to be registered for at least one graduate credit each term until the degree is complete.

PT - Physical Therapy

PHYSICAL THERAPY Courses

PT 621. Introduction to Physical Therapy. 2 Credits.

Students will be exposed to basic medical terminology, patient management skills involving draping, positioning, transfers, and gait training with assistive devices.

PT 627. Theory and Practice I. 4 Credits.

Several instructional units introduce the student to the basic areas of physical therapy. Units include orientation to the profession, basic safety procedures, physical modalities of heat and cold, electrotherapy, bandaging and sterile technique, and massage.

PT 628. Theory and Practice II. 4 Credits.

Instructional units in this course include introduction of therapeutic exercise approaches for patient types with differing diagnoses. Through critical thinking and problem solving, students learn how to design specific exercise approaches based upon the goals developed for various diagnostic groups. They also learn how to assess the effectiveness, success, and potential risks associated with exercise and develop strategies to modify the treatments based upon those factors.

PT 630. Concepts in Histology for Physical Therapy. 1 Credit.

The emphasis in this course in histology is on connective tissue, muscle tissue, tissues of the nervous system as well as the skeletal system. The course is intended to give the physical therapy student a basic understanding of cell structure and function in these major systems. The course integrates with human anatomy and neuroscience.

PT 634. Clinical Sciences I. 3 Credits.

A series of lectures designed to acquaint the student with the clinical areas related to pathological conditions frequently seen in physical therapy practice. The course develops an understanding of the disease processes and guides the student in the application and analysis of pathology in the care of the patient.

PT 635. Clinical Sciences II. 3 Credits.

This course is designed to acquaint the student with medical aspects and pathological conditions associated with musculoskeletal and cardiopulmonary disease and disorders. Subunits also include presentations on cancer, hospice care, and hematological disorders.

PT 638. Exercise Physiology. 2 Credits.

This course provides an overview of human physiology as it relates to exercise and the clinical practice of physical therapy. Energy systems and cardiopulmonary physiology will be covered, including electrocardiogram interpretation, as well as resistance training and weight loss.

PT 640. Patient Evaluation I. 3 Credits.

A beginning course in patient examination skills which focuses on documentation, vital signs and history/interviewing skills, Respiratory and cardiac examination, range of motion, surface anatomy palpation, reflex testing, and vascular status assessment are introduced.

PT 641. Patient Evaluation II. 3 Credits.

A continuation of the study of patient evaluation. The focus of this course is on the musculoskeletal respiratory and cardiovascular systems, and includes examination of posture and gait.

PT 655. Clinical Problem Solving I. 2 Credits.

Use of case discussions, sample patients, and small group experiences to challenge student's abilities to apply information from class to actual patient problems.

PT 656. Clinical Problem Solving II. 2 Credits.

Use of case discussions, sample patients and small group experience to challenge student's abilities to apply information from spring semester classes to actual patient problems. For this course, the emphasis is on therapeutic exercise, cardiopulmonary rehabilitation, and care of the acutely ill patient.

PT 665. Biomechanics/Kinesiology I. 3 Credits.

This course will review the musculoskeletal system with emphasis on normal movement of the spine and extremities and the coordinated muscle activity necessary to produce that movement. Students will learn manual muscle testing techniques. The course will also introduce basic concepts such as types of muscle contractions, torque production, and joint reaction forces.

PT 666. Biomechanics/Kinesiology II. 2 Credits.

Students will learn to assess the measurement of motion and forces in normal human movement. Trigonometry will be employed in the problem-solving section of the course as the student assesses forces, vectors and loads.

PT 669. Clinical Internship I. 4 Credits.

This first full-time clinical education period begins at the end of the first academic year of the program and is designed to permit progressive responsibility in patient evaluation and treatment based upon material learned in classes during the first year. Each student is required to provide one in-service presentation during the clinical learning experience.

PT 695. Topics in Physical Therapy. 1-3 Credits.

Advanced study of selected topics.

PT 792. Neuroscience I. 3 Credits.

Neuroscience I is the first in a series of courses that provide the student with an understanding of integrated neuroanatomy and neurophysiology. Emphasis will be placed upon basic neurophysiologic principles at the cellular level. Prerequisites: BIOL 889.

PT 793. Neuroscience II. 3 Credits.

Neuroscience II is the second course in the sequence. From the foundation of Neuroscience I, the course will build to the progressively higher order of structural functional relationships that control behavior. Prerequisites: PT 792 and BIOL 889.

PT 810. Scientific Inquiry I. 3 Credits.

This is the first in a series of courses that prepare the graduate to critically analyze and use scientific literature to improve clinical decision-making and practice. This course introduces the terminology and strategies of evidence-based practice applied to physical therapy. It emphasizes the basic concepts such as research design, measurement principles and basic statistics.

PT 822. Scientific Inquiry II. 2 Credits.

This course is a continuation of the graduate's preparation to practice critical analysis skills related to scientific literature. Its emphasis is placed on knowing the components of research reports and concepts associated with judging the quality and value of research. Students will apply this knowledge to answer clinical questions of diagnosis, prognosis, and intervention.

PT 826. Theory and Practice III. 4 Credits.

A continuation of the important aspects of physical therapy practice. This semester is made up of the following units: spinal cord injury, pediatric neurologic dysfunction, and adult neurologic dysfunction. The course focuses on treatment procedures including proprioceptive neuromuscular facilitation, current motor control and motor learning concepts, and neurodevelopmental treatment.

PT 827. Theory and Practice IV. 4 Credits.

This course covers advanced and special interest areas of practice such as joint mobilization, sports medicine, special testing equipment, mechanical traction application, and discharge planning for orthopaedic patients.

PT 836. Clinical Sciences III. 3 Credits.

This course continues with the presentation of pathologies and clinical manifestations of selected patient populations. Units within this course include pediatric, adult neurology, and spinal cord injury.

PT 837. Clinical Sciences IV. 3 Credits.

The continuation of a series in clinical areas. Emphasis areas in this course are on radiology, pharmacology, chronic pain, functional capacity evaluation and electrophysiological testing.

PT 842. Patient Evaluation III. 3 Credits.

This course covers the important evaluative elements associated with the neurological system, including evaluation of adult and pediatric patients with congenital or acquired conditions.

PT 857. Clinical Problem Solving III. 2 Credits.

Student must be a second year PT student enrolled in PT curriculum. Use of case discussions, sample patients, and small group experiences to challenge student's abilities to apply information from class to actual patient problems. For this course, the emphasis is on Neurological and pediatric patients.

PT 858. Clinical Problem Solving IV. 2 Credits.

Use of case discussions, sample patients, and small group experiences to challenge student's abilities to apply information from class to actual patient problems. For this course, the emphasis is on orthopedic patients.

PT 865. Prosthetics and Orthotics. 3 Credits.

This course addresses the examination, assessment and fabrication issues associated with the development of prosthetics and orthotics for selected patient populations. Prerequisites: PT 665 and PT 666.

PT 871. Clinical Internship II. 4 Credits.

The student is provided an 8-week opportunity to apply academic philosophy, theory, and practices during a period of clinical education. This internship or PT 872 will consist of a rehabilitation experience (pediatric or adult neurology). The student will be required to collect data for a research case study during this internship or PT 872.

PT 872. Clinical Internship III. 4 Credits.

The student is provided an 8-week opportunity to apply academic philosophy, theory, and practices during a period of clinical education. This internship or PT 871 will consist of a rehabilitation experience (pediatric or adult neurology). The student will be required to collect data for a research case study during this internship or PT 871.

PT 873. Clinical Internship IV. 4 Credits.

Students spend eight weeks at different facilities in a full-time internship. This course provides an opportunity to develop on-site innovative clinical investigations with program and clinical faculty coordination/supervision.

PT 874. Clinical Internship V. 4 Credits.

A final clinical experience for physical therapy students. Students spend eight weeks at different facilities in a full-time internship. This course provides an opportunity to develop on-site innovative clinical investigations with program and clinical faculty coordination/supervision.

PT 880. Psychosocial Aspects of Patient Care. 2 Credits.

This course focuses upon the emotional and psychological elements associated with illness and disease. Students will learn the various societal and personal views of sickness and chronic illness as well as the coping mechanism employed by individuals and families when facing disease and terminal illness.

PT 881. Management of Special Populations. 2 Credits.

This course describes physical therapy management of challenges associated with selected groups of people. Effects of aging on gait and equilibrium will be discussed. Topics will include osteoporosis, breast and prostate cancer, sexuality, nutrition, the female athlete, the senior athlete, health care placement options, and social support in American society.

PT 882. Practice Management. 3 Credits.

This course is designed to provide the physical therapy student with a review of the principles and practices of managing and administering physical therapy in various clinical settings. The course stresses the principles of management administration in patient care in clinical environments.

PT 883. Professional Issues in Physical Therapy. 2 Credits.

This course is for the identification, analysis, and discussion of issues currently facing the physical therapy profession. The issues focus on the ethical questions as well as the role relationships of physical therapists in the greater health care delivery system of the United States.

PT 884. Clinical Teaching and Professional Communication. 3 Credits.

This course is designed to meet the needs for patient instruction, education within the classroom and clinic, and peer continuing education. The focus of the course is on clear communication in the teaching/learning process.

PT 890. Differential Diagnosis Seminar. 3 Credits.

The focus of this seminar is on the integration of the student's knowledge in the areas of the foundation and clinical sciences through the application of problem solving in differential diagnosis.

PT 891. Seminar in Integrative Case Reports. 3 Credits.

This course provides the faculty and students the forum to present clinical case studies. The students will have collected the data for their individual case presentations during the previous summer internships.

PT 892. Scientific Inquiry Seminar. 2 Credits.

This is the final course in the Scientific Inquiry series. The purpose is to apply the concepts of research methods and design in the framework of evidence-based practice to specific clinical problems. Students will appraise systematic reviews, guidelines, and the economics of health care in a seminar format.

PT 893. Research Topics. 2 Credits.

Research topics.

PT 895. Topics in Physical Therapy I. 1 Credit.

This course will expose interprofessional students to current trends in health promotion and illness prevention. Topics will include: Healthy People 2020 objectives, age specific clinical guidelines for health promotion and illness prevention, theories on behavior and motivation, sociocultural issues, and screening for a variety of health problems. Measures for promoting and maintaining health throughout the lifespan will be explored with attention to current research from the literature.

PT 896. Topics in Physical Therapy II. 1 Credit.

Students will pick from a variety of clinical specialty practice, service learning or research topics to explore in a small group setting.

READ - Reading

READING Courses

READ 612. Action Research in Reading. 3 Credits.

This course will introduce students to action research, a form of self-reflective, systematic inquiry by educators of their own practice. Students will learn about research methods, design, and implementation, and they will develop action research proposals based on a line of structured inquiry emanating from events occurring within their own classrooms. Teachers will study student learning related to their own teaching, a process which allows them to learn about their own instructional practices and to continue monitoring improved student learning. Conducting action research provides educators with an avenue to reflect on their own teaching practices with the aid of empirical data and engage in self-directed learning with the ultimate goal of improving student learning. Must have completed 15 Graduate credit hours in reading coursework.

READ 618. Approaches to Teaching Literature and Writing K-12. 3 Credits.

Lecture 3 hours, 3 credits. Explores the theory and practice of teaching literature, including young adult and children's literature, and writing. Considers some of the characteristics of writing processes, the role of the teacher in structuring and responding to student writing, the role of the teacher in literary text selection, the relationships between writing and literacy understanding, and the authentic assessment of K-12 students' reading, writing and learning.

READ 619. Word Study, Phonics, and Linguistics. 3 Credits.

Provides an overview of the field of linguistics, the scientific study of language and word study, an approach to spelling instruction that relies on an understanding of English orthography that incorporates instruction in phonics, spelling and vocabulary. Students will learn to recognize characteristics of readers and writers at different levels of development. The course provides multiple opportunities for hands-on practice and application.

READ 620. Multicultural Children's Literature and Literacy. 3 Credits.

Lecture 3 hours; 3 credits. Provides for the examination, evaluation, and use of multicultural library materials and resources for elementary and middle school children.

READ 622. Culturally Responsive Literacy for All Learners. 3 Credits.

Explores curriculum, instructions, materials and issues related to teaching literacy and language to diverse learners regardless of their ethnic, cultural, linguistic, cognitive, religious, gender, backgrounds, etc.

READ 625. Issues and Trends in Literacy Education. 3 Credits.

This course provides an opportunity for students to explore the critical trends and issues being debated within the field of Literacy Education. This course will provide students with an in-depth understanding of significant issues, trends, and practices in reading instruction at the K-12 level. The course is designed to deal with questions and problems of the type facing teachers, supervisors, and administrators. In addition to providing students with a deeper understanding of current trends and the latest literacy research, this course will also help students to critique ideas and issues surrounding informed instruction within literacy education.

READ 628. New Literacies, Digital Technologies, and Learning. 3 Credits.

This course is designed to provide a context in which in-service teachers can explore a range of "new" literacies and consider their relationships to school-based literacy education. Participants will explore these new literacies, specifically the socially immersive experiences of youth and their new media practices. These participating educators will examine the role of multimodality in literacy learning across the curriculum with an emphasis on how to bridge the digital literacies of students' private lives with the traditional print practices valued in school. Teachers will gain insight into and understanding of how young people's participation in a shifting media landscape can help shape and form learning and literacy in the 21st Century classroom.

READ 637. Problems in Reading Education. 3 Credits.

Lecture, 3 hours. 3 credits. Prerequisite: FOUN 612 and 15 hours in Reading Education. Presents an overview of current reading research and its application to instruction. Provides study and practice in the use of quantitative or qualitative techniques, including analytical processes, in solving problems in reading education.

READ 680. Reading to Learn Across the Curriculum. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: Graduate standing. This class has an emphasis on advanced techniques in reading for classroom teachers who are not reading specialists. Students develop an understanding of the process of reading to learn across the curriculum including a wide variety of comprehension strategies and an understanding of the complex nature of reading throughout the disciplines. Lecture, demonstrations, development of materials, and practice in the techniques of reading for elementary and secondary classroom teachers and library media specialists are provided.

READ 683. Diagnostic Teaching of Reading in the Classroom. 3 Credits.

Lecture 3 hours, 3 credits. Provides classroom teachers with strategies/ techniques to employ to ongoing diagnosis and remediation through the use of informal and standardized tests to select appropriate instructional strategies for pupils' existing reading capabilities.

READ 685. Organizing and Supervising Reading Program Development. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: 9 graduate hours in reading. Presents an overview of the total school reading program (K-12), and not only prepares the prospective reading supervisor to make decisions pertaining to the procurement of materials for the program but also explores modes for integrating reading into the general curriculum.

READ 686. Advanced Language Development and Reading. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: Graduate standing. Explores current theories of cognitive development and their relationship to language development and reading as bases for evaluating methods and materials of teaching reading and the related communicative arts: spelling, writing, and speaking.

READ 689. Survey of Reading Instruction. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: graduate standing. Surveys the linguistic, psychological, sociological, philosophical, and historical foundations of current reading pedagogy.

READ 693. Practicum in Reading. 3 Credits.

Hours to be arranged. Prerequisite: 15 hours in graduate reading to include READ 683 and permission of the instructor. This course provides graduate teachers with opportunities to practice and further refine their understandings of the reading process in clinical and classroom settings. Teachers provide both individual and group reading lessons with students from the local community. Advanced diagnostic tests of learning processes and intellectual capacity are covered. These advanced diagnostic techniques are in addition to those covered in the initial diagnostic reading course.

READ 998. READ 998. 1 Credit.

REL - Religious Studies

RELIGIOUS STUDIES Courses

REL 595. Topics in Religious Studies. 3 Credits.

The advanced study of selected topics designed to permit qualified students to work on subjects that, because of their specialized nature, may not be taught regularly. These courses will appear in the course schedule and will be more fully described in information distributed to all academic advisors. Prerequisites: 3 hours in PHIL or permission of the instructor.

REL 596. Topics in Religious Studies. 3 Credits.

The advanced study of selected topics designed to permit small groups of qualified students to work on subjects of mutual interest which, due to their specialized nature, may not be offered regularly. These courses will appear in the course schedule, and will be more fully described in information distributed to all academic advisors.

REL 597. Tutorial Work in Religious Studies. 1-3 Credits.

Independent reading and study of a topic to be selected under the direction of an instructor. Conferences and papers as appropriate.

REL 598. Tutorial Work in Religious Studies. 1-3 Credits.

Independent reading and study of a topic to be selected under the direction of an instructor. Conferences and papers as appropriate.

REL 697. Tutorial Work in Religious Studies. 1-3 Credits.

Independent reading and study of a topic to be selected under the direction of an instructor. Conferences and papers as appropriate.

REL 698. Tutorial Work in Religious Studies. 1-3 Credits.

Independent reading and study of a topic to be selected under the direction of an instructor. Conferences and papers as appropriate.

SEPS - STEM Education and Professional Studies

STEM EDUCATION AND PROFESSIONAL STUDIES Courses

SEPS 500. Instructional Systems Development. 3 Credits.

Lecture 3 hours; 3 credits. Students learn how to design and develop classroom instructional materials including career and technical education and training curricula and programs for youths and adults. Skills in this area include the selection and use of materials, including media and computers and evaluation of pupil performance. Training specialist students learn to develop instructional materials using the instructional systems design process. Career and technical education students learn to plan instruction, to implement competency-based and standards-based education, and to modify and use the Virginia career and technical education curriculum guides.

SEPS 501. Foundations of Career and Technical Education. 3 Credits.

Lecture 3 hours; 3 credits. This course is designed to teach career and technical education majors to plan, develop, and administer a comprehensive program of career and technical education for high school students and adults. Students also develop an understanding of the historical and sociological foundations underlying the role, development and organization of public education in the United States.

SEPS 502. Instructional Methods in Occupational Studies. 3 Credits.

Lecture 3 hours; 3 credits. Designed to develop a student's ability to use basic instructional techniques and methods applicable to career and technical education, and adults in business, government, and industrial organizations. It involves videotaped micro-teaching demonstrations.

SEPS 503. Methods in Career and Technical Education. 3 Credits.

Lecture 3 hours; 3 credits. A practical study and application of recommended methods of teaching career and technical education to high school students. Video-taped micro-teaching demonstrations are included. The course should be taken the semester prior to student teaching.

SEPS 508. Advanced Classroom Issues and Practices in Career and Technical Education. 3 Credits.

An overview of classroom issues and practices for prospective career and technical teachers. The course covers classroom management and safety, communication processes, reading in the content area and child abuse and neglect recognition and intervention. Students learn the legal requirements and alternative teaching strategies for serving students with special needs. Students visit schools for a 30-hour student observation. PRAXIS II completion is a course requirement. Prerequisites: junior standing and passing scores on PRAXIS I or State Board of Education-approved SAT or ACT scores.

SEPS 509. Fashion Market Trip. 3 Credits.

Lecture 3 hours; 3 credits. This is the study of planning and conducting a fashion buying trip to one of the major fashion markets in the United States like the Las Vegas Magic Trade Show. The students envision themselves as buyers in action and learn how trend forecasting and creative presentations help market fashion products and services to trade customers and consumers.

SEPS 510. The Foreign Fashion Market Trip. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: SEPS 208. Students plan and conduct a fashion buying trip to a foreign market in Europe or Asia, and learn how to buy merchandise in the global marketplace. The course requires students to go on the trip as well as attend the pre- and post-trip classes.

SEPS 511. Fashion Show Production. 3 Credits.

Lecture 3 hours; 3 credits. Students plan and produce a fashion show. They examine each behind-the-scenes step from concept to execution as they organize and stage a show that is profitable, entertaining, and aesthetically pleasing.

SEPS 523. Visual Merchandising and Display. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: permission of the instructor. This course is designed to introduce students to the best practices and effective strategies in visual merchandising. It will provide the basic framework with which prospective merchandisers plan and construct visual displays that enhance the selling of merchandise and ideas.

SEPS 524. Fashion, Textiles, and Construction Analysis. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: permission of the instructor. This course explores information related to new technological advances in the textile/apparel industry and determines consumer preferences and concepts of fashion product quality. It includes the development of standards for judging qualities of merchandise. Fabrics are examined to determine the value they provide to the apparel and accessories customer.

SEPS 530. Technology Applications in Training. 3 Credits.

Lecture 3 hours; 3 credits. This course is designed to prepare training professionals to plan and conduct training using technological applications. The course covers instructional technology skills, computer systems, and software that trainers need so that they can teach basic computer and information skills in business, industry and government.

SEPS 531. Web-Based Organization for Fashion. 3 Credits.

Lecture 3 hours; 3 credits. This course provides the basic communications foundations needed to conceive, plan, develop, implement, and maintain a Web-based organization for fashion. Upon completion, students will understand what is required to plan, launch and maintain a successful online venture, limited only by the willingness of the student to explore these technological advances.

SEPS 535. Global Retailing. 3 Credits.

This course examines globalization and the development of an integrated global economy. Primary emphasis is placed on the strategies for successful global business expansion for retailers in international markets.

SEPS 540. Global Sourcing. 3 Credits.

This course examines the role of global sourcing in the strategic positioning of retailers in the global economy. Emphasis is placed on economic, political, logistical, and ethical factors affecting world trade and global sourcing decisions.

SEPS 550. Assessment, Evaluation and Improvement. 3 Credits.

Lecture 3 hours; 3 credits. This course prepares training and educational professionals to plan for and conduct assessments to use in planning instructional programs, evaluate individual learning, monitor student progress, measure program effectiveness and efficiency, and evaluate the return on investments of training courses and programs.

SEPS 571. Communication Industries. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: junior standing and industrial technology major for 471. A course designed to provide career and technical education teachers, industrial technologists, counselors, and administrators an opportunity to observe and enhance their knowledge of representative communication industries from the local region. (qualifies as a CAP experience).

SEPS 572. Construction Industries. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: junior standing and industrial technology major for 472. A course designed to provide career and technical education teachers, industrial technologists, counselors, and administrators an opportunity to observe and enhance their knowledge of representative construction industries from the local region. (qualifies as a CAP experience).

SEPS 584. Student Teaching Mentored. 6-12 Credits.

6-12 credits. Prerequisites: completion of the approved teacher education program in the major area, departmental approval, and permission of the director of teacher education services. Passing scores on PRAXIS I or State Board of Education-approved SAT or ACT scores and passing scores on the appropriate PRAXIS II content examination required. Classroom placement in school systems for students to apply content and methodologies. The student is mentored by a school mentor and university faculty. This course is for newly hired teachers on provisional contracts.

SEPS 586. Middle School Student Teaching for Technical Education. 6 Credits.

6 credits. Prerequisites: STEM 305, 306, SEPS 408, SPED 313, TLED 408 and SEPS 450; or SEPS 508, 596, STEM 730, SEPS 788, TLED 608, 616, READ 680 for graduate students. Passing scores on PRAXIS I or State Board of Education-approved SAT or ACT scores and passing scores on the appropriate PRAXIS II content examination are required. Classroom placement for student teaching in a middle school technology laboratory. Students apply content and methodology under the supervision of a cooperating teacher and university faculty member. Available for pass/fail grading only. (qualifies as a CAP experience).

SEPS 595. Topics in Occupational Education. 1-3 Credits.

1-3 credits each semester. Prerequisite: permission of the instructor. The department offers selected topics designed to permit small groups of qualified students to work in subjects of mutual interest which, due to their specialized nature, may not be offered regularly.

SEPS 596. Topics in Career and Technical Education. 1-3 Credits.

The department offers selected topics designed to permit small groups of qualified students to work in subjects of mutual interest which, due to their specialized nature, may not be offered regularly. Prerequisite: permission of the instructor.

SEPS 597. Independent Study in Occupational Education. 1-6 Credits.

1-6 credits. Prerequisite: permission of the instructor.

SEPS 603. Planning Issues for Vocational Special Needs Programs. 3 Credits.

Lecture 3 hours; 3 credits. Overview of vocational special needs programs and services including their purposes and practices; characteristics of special populations, including the medical and educational aspects of disability.

SEPS 604. Implementation and Administration of Vocational Special Needs Programs. 3 Credits.

Lecture 3 hours; 3 credits. This course includes career/life planning, transitioning, occupational information, and delivery of cooperative education programs, instructional methods, and curriculum modification and resources available to support vocational special needs programs.

SEPS 606. Vocational Evaluation Processes. 3 Credits.

Lecture 3 hours; 3 credits. This course includes the basic concepts and skills of planning for and delivering vocational evaluation and career assessment services, the use of vocational interviewing, individualized service planning, report development and communication, and use of modifications and accommodations. Students practice specific assessment techniques and skills and the processes used in vocational evaluation and career assessment, including job and training analysis, work samples and systems, situational and community-based assessment, behavioral observation, and learning and functional skills assessment.

SEPS 635. Research Methods in Occupational and Technical Studies. 3 Credits.

3 credits. Types of research, selection of problems, location of educational information, collection and classification of data, organization, presentation, and interpretation of findings. The focus is on conducting research in the student's content specialty area.

SEPS 636. Problems in Occupational and Technical Studies. 3 Credits.

Taken the last semester of graduate work. Practice in the use of statistical and analytical techniques in solving problems in occupational and technical studies related to secondary, community college, and training environments. Prerequisites: FOUN 612.

SEPS 695. Topics in Occupational Education. 1-3 Credits.

1-3 credits each semester. The SEPS department offers selected topics designed to permit groups of qualified students to work on subjects of mutual interest which, due to their specialized nature, may not be offered regularly.

SEPS 696. Topics in Occupational Education. 1-3 Credits.

1-3 credits each semester. The SEPS department offers selected topics designed to permit groups of qualified students to work on subjects of mutual interest which, due to their specialized nature, may not be offered regularly.

SEPS 697. Independent Study in Occupational Education. 1-3 Credits.

1-3 credits each semester. Prerequisite: permission of the instructor. Individual study under the supervision of a graduate faculty member.

SEPS 698. Thesis in Occupational Education. 3-6 Credits.

3-6 credits. Prerequisite: permission of the advisor. Research and writing of the master's thesis and scheduled conferences with the candidate's advisor.

SEPS 740. Readings in Occupational and Technical Studies. 3 Credits.

A guided review of the literature to determine the history, development, and issues of occupational and technical education, including specialization in technology education, career and technical education specialties, and human resources training.

SEPS 750. Trends and Issues in Training: Modeling and Simulation. 3 Credits.

Lecture 3 hours; 3 credits. This course is designed to explore the issues and trends in developing and implementing technology-based training with emphasis on modeling and simulation.

SEPS 760. Trends and Issues in Occupational Education. 3 Credits.

This course prepares training and educational professionals to plan for and conduct assessments to use in planning research findings and issues related to tech prep and other articulated programs being established in secondary schools, community colleges, and four-year institutions. Prerequisites: junior standing.

SEPS 761. Foundations of Adult Education and Training. 3 Credits.

This course is a study of adult education and training in many settings including the community college, business, industry, labor, government, the military, and social service agencies of many types. An attempt will be made to assess the important trends or directions such activities are taking, including the needs of non-traditional learners and education and labor.

SEPS 762. Administration and Management of Education and Training Programs. 3 Credits.

Lecture 3 hours; 3 credits. This course deals with organizational policy, human and financial resources, facilities, and the planning process as applied to occupational education and adult training programs.

SEPS 765. Trends and Issues of Economic and Workforce Development. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: student must be accepted into doctoral program or have permission of the instructor. An analysis of economic trends and issues that lead to workforce development decisions. Focus is on planning for educational and training programs to meet workforce needs dictated by local and regional economic issues. This course is designed for community college and school system personnel.

SEPS 780. Administration and Supervision of Occupational Education. 3 Credits.

Lecture 3 hours; 3 credits. Study of the principles and practices of administering and supervising occupational education programs.

SEPS 785. Curriculum Development in Occupational Education and Training. 3 Credits.

Lecture 3 hours; 3 credits. A course designed to prepare students to design and develop curriculum for occupational education and training courses and programs. Included is a focus on articulation between secondary.

SEPS 787. Career and Technical Education Curriculum. 3 Credits.

Lecture 3 hours; 3 credits. Learn the various curriculum options taught in secondary schools under the auspices of career and technical education. Work from an administrative standpoint to learn the mission and goals of the various subject areas and plan to direct such efforts.

SEPS 788. Instructional Strategies for Innovation in Training and Occupational Education. 3 Credits.

Learning and teaching styles are considered as a basis for developing instructional strategies to maximize occupational and technical education at all levels, including secondary, the community college, and senior institutions. Relevant learning theories and knowledge of self, learner, and the environment are blended to enhance the participants' instructional strategies.

SEPS 789. Instructional Technology in Education and Training. 3 Credits.

A course that provides insights about trends, issues, and the applications of instructional technologies as they may be applied to education and training environments. Topics include selected technical processes and electronic media to solve practical problems in education and training.

SEPS 790. Practicum in Occupational Education. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: permission of the graduate program director. Individually prescribed instruction under the supervision of a graduate faculty member. Study intended to professionally fulfill development of graduate candidates.

SEPS 795. Topics in Occupational Education. 1-3 Credits.

1-3 credits each semester. The SEPS department offers selected topics designed to permit groups of qualified students to work on subjects of mutual interest which, due to their specialized nature, may not be offered regularly.

SEPS 797. Independent Study in Occupational Education. 1-6 Credits.

1-6 Credits. Prerequisite: Permission of the instructor. Individual study under the supervision of an OTED graduate faculty member.

SEPS 835. Research Design for Occupational and Technical Studies. 3 Credits.

Lecture 3 hours; 3 credits. Analyses of current research and needs in occupational and technical studies. Students analyze the literature and develop a research focus for future graduate studies.

SEPS 840. Readings in Occupational and Technical Studies. 3 Credits.

A guided review of the literature to determine the history, development, and issues of occupational and technical education, including specialization in technology education, career and technical education specialties, and human resources training.

SEPS 850. Trends and Issues in Training: Modeling and Simulation. 3 Credits.

This course is designed to explore the issues and trends in developing and implementing technology-based training with emphasis on modeling and simulation.

SEPS 860. Trends and Issues in Occupational Education. 3 Credits.

Trends in philosophy, workforce needs, curriculum and teaching procedures in occupational and technical education. Analysis of research findings and issues related to tech prep and other articulated programs being established in secondary schools, community colleges, and four-year institutions.

SEPS 861. Foundations of Adult Education and Training. 3 Credits.

This course is a study of adult education and training in many settings including the community college, business, industry, labor, government, the military, and social service agencies of many types. An attempt will be made to assess the important trends or directions such activities are taking, including the needs of non-traditional learners and education and labor.

SEPS 862. Administration and Management of Education and Training Programs. 3 Credits.

Lecture 3 hours; 3 credits. This course deals with organizational policy, human and financial resources, facilities, and the planning process as applied to occupational education and adult training programs.

SEPS 865. Trends and Issues of Economic and Workforce Development. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: student must be accepted into doctoral program or have permission of the instructor. An analysis of economic trends and issues that lead to workforce development decisions. Focus is on planning for educational and training programs to meet workforce needs dictated by local and regional economic issues. This course is designed for community college and school system personnel.

SEPS 868. Internship. 3 Credits.

Internship. 3 Credits. Prerequisite: permission of the instructor. Supervised assignment to an agency operating an occupational education or training program.

SEPS 880. Administration and Supervision of Occupational Education. 3 Credits.

Lecture 3 hours; 3 credits. Study of the principles and practices of administering and supervising occupational education programs.

SEPS 885. Curriculum Development in Occupational Education and Training. 3 Credits.

Lecture 3 hours; 3 credits. A course designed to prepare students to design and develop curriculum for occupational education and training courses and programs. Included is a focus on articulation between secondary.

SEPS 887. Career and Technical Education Curriculum. 3 Credits.

Lecture 3 hours; 3 credits. Learn the various curriculum options taught in secondary schools under the auspices of career and technical education. Work from an administrative standpoint to learn the mission and goals of the various subject areas and plan to direct such efforts.

SEPS 888. Instructional Strategies for Innovation in Training and Occupational Education. 3 Credits.

Learning and teaching styles are considered as a basis for developing instructional strategies to maximize occupational and technical education at all levels, including secondary, the community college, and senior institutions. Relevant learning theories and knowledge of self, learner, and the environment are blended to enhance the participants' instructional strategies.

SEPS 889. Instructional Technology in Education and Training. 3 Credits.

A course that provides insights about trends, issues, and the applications of instructional technologies as they may be applied to education and training environments. Topics include selected technical processes and electronic media to solve practical problems in education and training.

SEPS 890. Practicum in Occupational Education. 3 Credits.

Individually prescribed instruction under the supervision of a graduate faculty member. Study intended to professionally fulfill development of graduate candidates. Prerequisites: permission of the graduate program director.

SEPS 895. Topics in Occupational Education. 1-3 Credits.

1-3 credits each semester. The SEPS department offers selected topics designed to permit groups of qualified students to work on subjects of mutual interest which, due to their specialized nature, may not be offered regularly.

SEPS 897. Independent Study in Occupational Education. 1-6 Credits.

1-6 Credits. Prerequisite: Permission of the instructor. Individual study under the supervision of an OTED graduate faculty member.

SEPS 899. Dissertation in Occupational Education. 1-12 Credits.

1-12 credits. Prerequisite: permission of dissertation committee chair. Work on pre-selected dissertation topics under the direction of dissertation committee chair.

SEPS 998. SEPS 998. 1 Credit.**SEPS 999. Occupational and Technical Education 999. 1 Credit.**

1 credit. A one-hour pass/fail registration required of all graduate students to maintain active status during the final semester prior to graduation. After successfully passing the candidacy examination, all doctoral students are required to be registered for at least one graduate credit each term until the degree is complete.

SMGT - Sport Management

SPORT MANAGEMENT Courses

SMGT 556. Sport Psychology. 3 Credits.

Study of the psychological bases of coaching strategies and methodologies. Emphasis is placed on applying knowledge in field settings.

SOC - Sociology

SOCIOLOGY Courses

SOC 500. War and Gender. 3 Credits.

In this course students grapple with issues concerning war, gender roles, and gender inequality. The course addresses gender roles in war throughout history, globally and across cultures. However, the United States military and military involvement in the 20th and 21st century will remain the primary focus areas. Discussions include how social norms and ideals of masculinity and femininity shape, and in turn are shaped by, images and realities of war, including gendered aspects of nationalism and just war theories. The military involvement of men, women (and children) in war and in peacetime, as participants and observers, perpetrators and victims, supporters and opponents of war is also discussed.

SOC 502. Sociology of Child Welfare. 3 Credits.

A sociological analysis of the field of child welfare. Topics include social inequality as it applies to children as a group in the U.S. and globally; understanding violence against children within the global context of children's rights; examining data on the degree to which policies, programs and research in the field fail to protect children and why; prevalence, causes and consequences of child sexual, physical and emotional abuse and neglect; evaluation of programs like 'family preservation' and placement in 'substitute' care, i.e. foster care, adoption, institutionalization; changes that would protect and advance the interests and rights of children at the parent-child, agency and societal level.

SOC 505. Social Change and Social Movements. 3 Credits.

Analysis of the nature and causes of social change, major social movements, and their impact upon contemporary society.

SOC 521. Deviant Behavior. 3 Credits.

A study of various definitions and forms of deviant behavior, theoretical explanations of causes of deviant behavior and the impact of deviant behavior on society and the individual.

SOC 523. Women, Health and Healing. 3 Credits.

An examination of women's experiences with health and illness and women's roles in the health-care system as patients and care providers from a feminist sociological perspective.

SOC 526. The Sociology of Minority Groups. 3 Credits.

The study of the process of and responses to the oppression of racial, religious, ethnic, and national minorities in a variety of countries within a historical and comparative perspective. Special emphasis given to American minorities and especially African Americans.

SOC 527. Violence Against Women. 3 Credits.

A critical analysis of violence against women as an institution of social control. Examines violence in the context of social and political inequality and feminist critique. Issues explored include pornography, prostitution, sexual harassment, incest, battering and rape.

SOC 540. Health, Illness, and Society. 3 Credits.

The study of social and social-psychological factors related to health, illness, and treatment with a focus on social epidemiology, the medical industry, and health, illness, and sick-role behavior.

SOC 541. Drugs and Society. 3 Credits.

Topics include changes in the legal status of drugs, cross-cultural and historical variations in the control and use of drugs, and social epidemiology of drug use in contemporary society.

SOC 595. Topics in Sociology. 3 Credits.

The advanced study of selected topics designed to permit qualified students to work on subjects of mutual interest which, due to their specialized nature, may not be offered regularly. These courses will appear in the course schedule, and will be more fully described in information distributed to academic advisors.

SOC 596. Topics in Sociology. 3 Credits.

The advanced study of selected topics designed to permit students to work on subjects of mutual interest which, due to their specialized nature, may not be offered regularly. These courses will appear in the course schedule, and will be more fully described in information distributed to academic advisors.

SOC 597. Tutorial Work in Special Topics in Sociology. 1-3 Credits.

Independent reading and study on a topic to be selected under the direction of an instructor. Conferences and papers as appropriate.

SOC 598. Tutorial Work in Special Topics in Sociology. 1-3 Credits.

Independent reading and study on a topic to be selected under the direction of an instructor. Conferences and papers as appropriate.

SOC 610. Applied Social Research Methods. 3 Credits.

The application of social science methods to practical problems. The topics of research design, measurement, scaling, sampling, data collection, and research organization are taught with reference to issues of reliability, validity and ethical concerns.

SOC 620. Proseminar in Sociological Theory. 3 Credits.

An examination of classical and contemporary sociological theories about the relations between the individual and society; the ways theory shapes and informs the study of social issues; and the relationship among theory, research and practice.

SOC 627. Violence Against Women. 3 Credits.

This course examines the many ways in which violence against women functions as an agent of social control. Violence is viewed on a continuum in order to determine how a variety of acts contribute to the subordination of women. Specific types of violence are explored including: wife assault, rape, incest, sexual harassment and pornography.

SOC 630. Applied Social Statistics. 3 Credits.

This course is a graduate-level introduction to social statistics as they may be applied to various practical problems. Students will learn the appropriate use of various statistical procedures through discussion and application. Prerequisites: SOC 610.

SOC 640. Sociological Application of Computer and Data Analysis. 3 Credits.

This course is a graduate-level introduction to the use of the computer in problems of data management and analysis. Students will use existing software packages (e.g. SPSS, SAS) to build specified data files and carry out various statistical procedures. Prerequisites: SOC 610.

SOC 644. Current Feminist Research in Sociology. 3 Credits.

The course provides a feminist analysis of the way women and gender traditionally have been studied in mainstream sociology. A minimum of one-third of the course is devoted to feminist critique of conventional conceptual and methodological approaches to gender relations in the social sciences. Feminist epistemological challenges are used to evaluate current research on selected topics reflecting the specialization and research interests of the faculty who teach the course.

SOC 650. Research Seminar. 3 Credits.

This seminar integrates the skills needed to complete a master's thesis. Exercises include formulating research questions, developing a research design, and writing a publishable paper. Students practice these skills assignments in class and by completing their thesis proposal. Prerequisites: SOC 610 or CRJS 610, SOC 620 or CRJS 620, SOC 630 or CRJS 630, and SOC 640 or CRJS 640.

SOC 660. Sociology Seminar. 3 Credits.

An examination of contemporary research and policy issues in the study of sociology. The course also provides an overview for specific concentrations in criminal justice and women's studies when necessary. Prerequisites: SOC 610 and SOC 620 and SOC 630 and SOC 640 and 6 hours of SOC electives at the graduate level.

SOC 668. Internship. 3 Credits.

Students gain first-hand experience in professional settings which are deemed appropriate given their academic background and career objectives. Students will be required to complete a research project which corresponds to their specific internship placement. Prerequisites: Permission of the instructor.

SOC 695. Topics of Sociology. 3 Credits.

Topics vary each semester.

SOC 696. Topics of Sociology. 3 Credits.

Topics vary each semester.

SOC 697. Independent Study in Special Topics in Sociology. 3 Credits.

Independent reading and study on a topic to be selected under the direction of an instructor. Conferences and papers as appropriate. Prerequisites: Approval of the department chair.

SOC 698. Independent Study in Special Topics in Sociology. 3 Credits.

Independent reading and study on a topic to be selected under the direction of an instructor. Conferences and papers as appropriate. Prerequisites: Approval of the department chair.

SOC 699. Thesis. 3-9 Credits.

Credit hours to continue thesis work.

SOC 740. Demographic Techniques. 3 Credits.

Basic methods of demographic analysis. Topics include population estimation and projection and the measurement of fertility, mortality, and migration.

SOC 795. Topics in Sociology. 3 Credits.

Topics vary by semester. Prerequisites: Six hours of graduate credit.

SOC 797. Independent Study in Sociology. 3 Credits.

Independent reading and study on a topic to be selected under the direction of an instructor. Prerequisites: Approval of department chair and 6 hours of graduate credit.

SOC 840. Demographic Techniques. 3 Credits.

Basic methods of demographic analysis. Topics include population estimation and projection and the measurement of fertility, mortality, and migration.

SOC 895. Topics in Sociology. 3 Credits.

Topics vary by semester. Prerequisites: Six hours of graduate credit.

SOC 897. Independent Study in Sociology. 3 Credits.

Independent reading and study on a topic to be selected under the direction of an instructor. Prerequisites: Approval of department chair and 6 hours of graduate credit.

SOC 998. SOC 998. 1 Credit.

SOC 999. SOC 999. 1 Credit.

Thesis hours.

SPAN - Spanish

SPANISH Courses

SPAN 507. Advanced Grammar and Syntax. 3 Credits.

Lecture 3 hours; 3 credits. Designed to refine competence in grammar and style in the process of writing various types of essays.

SPAN 510. Spanish Applied Linguistics. 3 Credits.

Lecture 3 hours; 3 credits. Course is an introduction to Spanish linguistics and its application to the teaching and learning of Spanish. Topics include Spanish syntax, semantics phonetics, and pragmatics and their practical applications to language learning.

SPAN 515. Spanish Phonetics. 3 Credits.

Lecture 3 hours; 3 credits. A study of the sound system of Spanish from both theoretical and applied perspectives. Intensive practice in pronunciation and contrastive analysis of Spanish and English.

SPAN 547. Drama of the Spanish Golden Age. 3 Credits.

Lecture 3 hours; 3 credits. A study of selected works of the major playwrights of the Golden Age: Lope de Vega, Calderon de la Barca, Tirso de Molina, Ruiz de Alarcon.

SPAN 548. Contemporary Spanish Drama. 3 Credits.

Lecture 3 hours; 3 credits. A study of contemporary Spanish playwrights since Federico García Lorca.

SPAN 549. Contemporary Spanish-American Drama. 3 Credits.

Lecture 3 hours; 3 credits. A study of contemporary Spanish-American drama through the reading of representative authors.

SPAN 550. Contemporary Peninsular Narrative. 3 Credits.

Lecture, 3 hours; 3 credits. Prerequisites: SPAN 311, 312W and (SPAN 331 or 332 or 333 or 334). Study of contemporary peninsular narrative works (novel, essay and some short story) within the Spanish social, political and cultural context of the last 40 years (1970-2012).

SPAN 551. Contemporary Latin American Narrative. 3 Credits.

Lecture, 3 hours. 3 credits. Prerequisites: SPAN 311, 312W and (SPAN 331 or 332 or 333 or 334). Study of contemporary Latin American narrative works (novel, essay and some short story) within the Spanish social, political and cultural context since the 1920's.

SPAN 552. Latin American Poetry. 3 Credits.

Basic comprehension about representative works of Spanish American poetry after Ruben Dario and their influences on contemporary culture. Prerequisites: SPAN 311, SPAN 312W, and one 300-level SPAN literature course.

SPAN 553. Border Culture and Literature. 3 Credits.

Lecture, 3 hours. 3 credits. Prerequisites: SPAN 311, 312W and one from SPAN 331, 332, 333, or 334. Study of variety of current texts from the U.S. and Mexico, this course will explore the multiplicity of images that surround and define the highly contested and increasingly important area of the border. Course will focus on questions dealing with subaltern identities such as women, indigenous groups, immigrants, and the poor.

SPAN 569. Hispanic Film. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: 9 hours of 300-level Spanish courses. A topical study of the major works of Spanish and Latin American film from Buneul to the present. The course will explore many issues, including those related to gender, race, symbolism, and class struggle. (cross-listed with COMM 443/543).

SPAN 571. Hispanic Women Authors. 3 Credits.

Lecture 3 hours; 3 credits. A study of fictional and non-fictional works by Spanish, Spanish-American, and U.S. Latina writers from the 16th to the 20th century. The course analyzes gender identity and roles and the interaction of gender, race, and class in literary representations of courtship and marriage, spirituality, nationalism, colonialism, and multiculturalism. (cross-listed with FLET 571).

SPAN 573. Contemporary Latina Literature: From Borders to Crossroads. 3 Credits.

Lecture 3 hours; 3 credits. The course focuses on poetry, prose fiction and theater written by Chicana, Puerto Rican, Cuban-American, and Dominican-American women authors in the last twenty years. Attention will also be paid to the very influential theoretical work written by Chicanas.

SPAN 595. Topics in Spanish. 1-3 Credits.

1-3 credits each semester. The advanced study of selected topics designed to permit small groups of qualified students to work on subjects of mutual interest which, due to their specialized nature, may not be offered regularly. These courses will appear in the course schedule and will be more fully described by academic advisors.

SPAN 596. Topics in Spanish. 1-3 Credits.

1-3 credits each semester. The advanced study of selected topics designed to permit small groups of qualified students to work on subjects of mutual interest which, due to their specialized nature, may not be offered regularly. These courses will appear in the course schedule and will be more fully described by academic advisors.

SPAN 602. Intensive Spanish for Teachers: Language and Culture. 3 Credits.

Lecture 3 hours; 3 credits. This course is designed for Spanish teachers interested in keeping up with cultural developments in the Spanish-speaking world and in main-taining/improving linguistic performance. Emphasis will be placed on authentic materials from newspapers, magazines, film and video, and the Internet.

SPAN 668. Internship in Spanish. 3 Credits.

Individualized practical experience. Students gain first-hand experience in settings that are appropriate given their academic background and career objectives. Prerequisite: Departmental approval required.

SPAN 695. Topics in Spanish. 1-9 Credits.

Lecture 1-9 hours; 1-9 credits. Advanced study of selected topics which may not be offered regularly. These courses appear in the course schedule booklet and are more fully described in supplements distributed to graduate program directors.

SPAN 696. Topics in Spanish. 1-9 Credits.

Lecture 1-9 hours; 1-9 credits. Advanced study of selected topics which may not be offered regularly. These courses appear in the course schedule booklet and are more fully described in supplements distributed to graduate program directors.

SPAN 697. Tutorial Work in Special Topics in Spanish. 1-3 Credits.

1-3 credits. Prerequisites: approval of the department chair. The independent reading and study on a topic to be selected under the direction of an instructor. Conferences and papers as appropriate.

SPAN 698. Tutorial Work in Special Topics in Spanish. 3 Credits.

1-3 credits. Prerequisites: approval of the department chair. The independent reading and study on a topic to be selected under the direction of an instructor. Conferences and papers as appropriate.

SPED - Special Education

SPECIAL EDUCATION Courses

SPED 500. Foundations of Special Education: Legal Aspects and Characteristics. 3 Credits.

The course provides an introduction and overview of the field of special education from the perspective that it is a subsection of general education and that the field is in transition by virtue of philosophical, legislative and programmatic changes. Legal aspects, regulatory requirements, and critical analyses of research are addressed. This course includes a broad overview of the expectations associated with the identification, characteristics, and education of students with disabilities. Prerequisite: junior standing.

SPED 502. Instructional Design I: Learner Characteristics and Assessment. 3 Credits.

The intent of this course is to provide pre-service teachers with: (a) knowledge of the characteristics of students with mild disabilities who are accessing the general curriculum, K-12, including, but not limited to learning disabilities, emotional disabilities and intellectual disabilities and (b) the ability to develop knowledge and skill in the selection, administration, scoring and interpretation of standardized/norm-referenced assessments of exceptional learners. Administering formal and informal assessment tools and the development of an IEP are emphasized. The use of assessment data to improve instruction and student performance is discussed. Prerequisites: SPED 400/SPED 500.

SPED 503. Directed Field Experience in Special Education. 2 Credits.

This course provides variable hours of direct participation in a community or educational setting with individuals with special needs. The course includes specific skills of program planning, implementation, evaluation and classroom management. Practicum of 45 hours required. Corequisite: SPED 583. Prerequisites: SPED 400/SPED 500 and SPED 402/SPED 502 and passing scores on Praxis Core Academic Skills for Educator Tests or equivalent as prescribed by the Virginia Board of Education.

SPED 504. Characteristics and Medical Aspects of Disabling Conditions. 3 Credits.

This course reviews medical conditions present among individuals with disabilities and implications for classroom instruction. Prerequisites: SPED 500.

SPED 506. Students with Diverse Learning Needs in the General Education Classroom. 3 Credits.

This course introduces general education teachers to the legal aspects and educational needs of at-risk students and those with disabilities. Emphasis is on characteristics of children with special needs and procedures for effective academic, behavioral, and social integration of these children in the general education classroom. Prerequisites: junior standing.

SPED 511. Classroom and Behavioral Management Techniques for Students with Diverse Needs. 3 Credits.

This course will address classroom management techniques and individual interventions based upon behavioral, cognitive, affective, social, and ecological theory and practice. The course will focus on the field of applied behavior analysis, including best practices in the areas of data collection, program selection, program implementation, and data analysis. Positive behavior management and supports and functional behavioral assessment will be emphasized. Pre- or corequisite: SPED 400/SPED 500.

SPED 515. Instructional Design II: Curricular Procedures and Individualized Education Planning. 3 Credits.

The intent of this course is to provide preservice teachers with: (a) knowledge of research-based instruction for K-12 students with disabilities and those who are gifted; (b) knowledge and skill in using data collection to make decisions about student progress, instruction, program, accommodations and teaching methodology for exceptional learners, and (c) knowledge and skill in planning, developing and implementing individual educational plans and group instruction for diverse exceptional learners who are accessing the general education curriculum and the Virginia Standards of Learning. Practicum of 45 hours required. Prerequisites: SPED 400/SPED 500, SPED 402/SPED 502, and passing scores on Praxis Core Academic Skills for Educator Tests or equivalent as prescribed by the Virginia Board of Education.

SPED 517. Collaboration and Transitions. 3 Credits.

This course addresses the complex issues surrounding families and children with disabilities and transitions across the lifespan, as well as effective collaboration with families and professionals to support inclusion and/or effective early intervention services, educational programs and transition services for students at-risk and students with disabilities. Emphasis is on successful professional collaboration and effective relationships in educational, transition, and family settings. Pre- or corequisite: SPED 400/SPED 500.

SPED 532. Characteristics of Students with Visual Impairments. 1 Credit.

Provides an overview of the characteristics of and services to persons with visual impairments, including the impact of visual impairment on infants' and children's growth and development, child and adolescent emotional and social development, and family interaction patterns. Considers the educational, conceptual, psycho-social, and physical implications of a visual impairment. Prerequisites: SPED 400/SPED 500.

SPED 533. Braille Code. 3 Credits.

This course provides instruction in the development, use, and application of the Braille literary code and its implications for educational/literacy programs for students with visual disabilities. Students will develop the skills to read and write contracted and uncontracted Braille, while acquiring instructional methodologies for teaching children who are blind to read and write. Sources of Braille materials for educational purposes are identified. Pre- or corequisite: SPED 400/SPED 500 and SPED 432/SPED 532.

SPED 534. Medical and Educational Implications of Visual Impairments. 3 Credits.

Provides an introduction to anatomy and physiology of the visual system and the educational implications of visual pathology. Topics include anatomy of the human eye, normal visual development, pathology of the eye, examination procedures for the identification of visual pathology, and the effects of pathology on visual learning and development. Practicum of 25 hours required. Prerequisites: passing Praxis Core Academic Skills for Educator Tests scores or equivalent as prescribed by the Virginia Board of Education. Pre- or corequisite: SPED 400/SPED 500 and SPED 432/SPED 532.

SPED 535. Orientation and Mobility. 2 Credits.

Provides the foundation for understanding the components and essence of orientation and mobility. Establishes how the need for independent travel in the blind population created the field of O&M. Explores the philosophy and history of orientation and mobility including cane instruction, dog guides and methods of travel. Addresses techniques in developing orientation skills and basic mobility instruction. Motor and concept skill development are emphasized. Practicum of 45 hours required. Prerequisites: Passing Praxis Core Academic Skills for Educator Tests scores or equivalent as prescribed by the Virginia Board of Education. Pre- or corequisite: SPED 400/SPED 500 and SPED 432/SPED 532.

SPED 536. Curriculum and Assessment of Students with Visual Impairments. 3 Credits.

Provides students with knowledge and understanding of the educational assessment of students with visual impairments and additional disabilities including deaf-blindness. Students will practice assessing and planning educational programs for students with visual impairments. Addresses assessment of technology for students with visual impairments. Examines determination of learning needs and appropriate learning media, relationship of assessment, IEP development, and placement. Practicum requires a minimum of 25 hours. Prerequisites: passing scores on Praxis Core Academic Skills for Educator Tests or equivalent as prescribed by the Virginia Board of Education. Pre- or corequisite: SPED 400/SPED 500 and SPED 432/SPED 532.

SPED 537. Assistive Technology for People with Sensory Impairments. 3 Credits.

This course is designed for professionals and/or students interested in serving the visually impaired/blind population or hearing impaired/deaf population. It is designed to heighten the awareness of participants to specific technology and resources available to enhance and improve the ability of individuals with visual and hearing impairments to succeed in school, daily living activities and employment. Knowledge and awareness components of this course will be delivered via distance education. Pre- or corequisite: SPED 400 or SPED 500 and SPED 432 or SPED 532.

SPED 560. Teaching Preschoolers With Diverse Needs. 3 Credits.

This course prepares students in developing skills in curricula, materials, and methods of instruction for preschool-aged (2-6 years) children with diverse needs. Programming for personal-social, language, motor, and cognitive development are addressed. Data collection, programmatic organization, and classroom planning are covered. Practicum of 45 hours required. Pre- or corequisite: SPED 500.

SPED 561. Developmental/Ecological Assessment Strategies. 3 Credits.

This course provides students with the skills necessary for assessment of atypical development as well as best practices involved in assessment. Students explore and give assessments to children from birth through eight years of age or older with severe disabilities. Pre- or corequisite: SPED 400 or SPED 500.

SPED 567. Collaboration, Transitions and Infant-Family Intervention. 3 Credits.

This course prepares professionals from cross-discipline backgrounds to serve families with children who are at-risk and disabled from birth to age three. Emphasis is placed on development of IFSPs, procedures, materials, transitions, and curricula for this population. Pre- or corequisite: SPED 400 or SPED 500.

SPED 569. Communication/Language Development/Intervention for Students with Significant Disabilities. 3 Credits.

This course examines symbolic and non-symbolic communication/language development and acquisition. Emphasis is on routine-based communication training, communication/language facilitation strategies, augmentative communication systems, and informal/functional communication/language assessment procedures for students in early childhood special education, students with autism, and students with multiple disabilities. Prerequisites: SPED 400/SPED 500.

SPED 583. Field Experience Seminar in Special Education. 1 Credit.

Prerequisites: SPED 313, SPED 400/SPED 500 and SPED 402/SPED 502. Explores issues, problems, concerns and processes related to teaching and entering the profession of teaching. Passing scores on the Virginia Communication and Literacy Assessment (VCLA), Praxis II: Elementary Education Content Test, and Virginia Reading Assessment (VRA)/ Reading for Virginia Educators (RVE) will be required by the end of the course.

SPED 586. Teacher Candidate Internship for Special Endorsement. 9 Credits.

Seven weeks will be completed at the elementary level and seven weeks will be completed at the middle/secondary level. Qualifies as a CAP experience. Prerequisites: admission to ODU Teacher Education Program; completion of the approved teacher education program in the specific endorsement area; completion of SPED 583; departmental approval; passing scores on Praxis Core Academic Skills for Educator Tests (or equivalent as prescribed by the Virginia Board of Education); passing scores on Virginia Communication and Literacy Assessment (VCLA), the Virginia Reading Assessment (VRA)/ Reading for Virginia Educators (RVE), and the appropriate Praxis II content examination.

SPED 595. Topics in Special Education. 1-3 Credits.

This course offers selected topics designed to permit small groups of qualified students to work on subjects of mutual interest in the special education field. Prerequisites: SPED 400/SPED 500.

SPED 610. Characteristics of Students Accessing the General Curriculum. 3 Credits.

Prerequisites: SPED 400/SPED 500. The intent of this course is to provide pre-service and currently licensed teachers with(a) knowledge of the characteristics of students with disabilities who are accessing the general curriculum, K-12, including, but not limited to learning disabilities, emotional disabilities, and intellectual disabilities; (b) the ability to recognize etiologies, underlying factors, and contributing conditions that impact student learning, and (c) the cultural impact of disabling conditions.

SPED 611. Instructional Strategies for Students accessing the General Education Curriculum. 3 Credits.

This course emphasizes effective research-based instructional strategies for teaching students with mild/moderate disabilities in grades K-12 who are accessing the general education curriculum. Practicum of 45 hours in middle/secondary-level setting is required. Prerequisites: SPED 400/SPED 500, SPED 415/SPED 515, SPED 610 and passing scores on Praxis Core Academic Skills for Educator Tests or equivalent as prescribed by the Virginia Board of Education.

SPED 615. Behavior Change in Classroom. 3 Credits.

This course will focus on the following elements of effective management: integration of instruction for positive learning environment; strategies to provide students the opportunity to be successful academically, emotionally, and socially; assessment of and modifying the learning environment; and group and individualized strategies to affect behavior change in order to increase student learning.

SPED 618. Characteristics and Advanced Procedures: Emotional and Behavioral Disorders. 3 Credits.

This course addresses characteristics and various approaches to the education and treatment of emotional/behavioral disorders. Emphasis is on group/individualized programming that addresses social, emotional, academic and behavioral needs. Behavior measurement and direct observation, problem behavior specification, intervention development and implementation, data collection and analysis, curricular adaptation, and teacher collaboration skills for successful regular classroom reintegration and transition are also discussed. Practicum of 45 hours required. Prerequisites: SPED 400/SPED 500, SPED 415/SPED 515, and passing scores on Praxis Core Academic Skills for Educator Tests or equivalent as prescribed by the Virginia Board of Education.

SPED 621. Effective Interventions for Children and Youth with Challenging Behavior. 3 Credits.

Students with challenging behavior pose a tremendous challenge to school personnel. Along with the growing incidence of behavior problems, there has been a dramatic increase in the number of research-supported interventions. Emphasis is on assessment of the structural and functional properties of problem behavior to facilitate development of interventions that match the nature and severity of the problem behavior. The course focuses on gaining knowledge of the likely source(s) of challenging behavior, including various strategies to document the environmental determinants of the behavior, establishment of school-wide, classroom-level, and student-specific intervention programs and ways to document the outcome of those interventions. Attention is given to adult- as well as peer-mediated intervention options for problem behavior reduction/replacement among children and youth from diverse backgrounds and across categories of exceptionality. Practicum of 45 hours required. Prerequisites: SPED 400/SPED 500, SPED 411/SPED 511, and passing scores on Praxis Core Academic Skills for Educator Tests or equivalent as prescribed by the Virginia Board of Education.

SPED 623. Characteristics and Advanced Procedures: Intellectual Disabilities. 3 Credits.

The course examines the characteristics and various approaches to the education and treatment of students with intellectual disabilities and developmental disabilities. Assessment, curriculum development, instructional design, appropriate placement setting, transition and utilization of environmental resources are emphasized. Practicum of 45 hours required. Prerequisites: SPED 400/SPED 500, SPED 415/SPED 515, and passing scores on Praxis Core Academic Skills for Educator Tests or equivalent as prescribed by the Virginia Board of Education.

SPED 625. Characteristics of Students with Autism Spectrum Disorders. 3 Credits.

This course includes a review of characteristics, etiology, prevalence, and perspectives of students with autism spectrum disorders. Prerequisites: SPED 400/SPED 500.

SPED 626. Characteristics and Advanced Procedures: Learning Disabilities. 3 Credits.

This course provides the professional educator with a variety of educational procedures for students with learning disabilities, including diagnostic assessment, causal nature, and research based instructional strategies for teaching students with learning disabilities. This course has an applied emphasis and includes a 45-hour practical experience with students with learning disabilities. Practicum of 45 hours required. Prerequisites: SPED 400/SPED 500, SPED 415/SPED 515, and passing scores on Praxis Core Academic Skills for Educator Tests or equivalent as prescribed by the Virginia Board of Education.

SPED 627. Instructional Strategies for Students with Autism Spectrum Disorders. 3 Credits.

This course includes a review of intervention strategies for students with autism spectrum disorders. Practicum of 45 hours required. Prerequisites: SPED 400/SPED 500, SPED 415/SPED 515, and passing scores on Praxis Core Academic Skills for Educator Tests or equivalent as prescribed by the Virginia Board of Education.

SPED 628. Instructional Strategies for Students Accessing the Adapted Curriculum. 3 Credits.

This course addresses the characteristics and instructional strategies of students accessing the adapted curriculum. Emphasis is on assessment, program development, academic, and functional skills instruction. This course addresses the needs of individuals with severe and/or profound multiple disabilities. Practicum of 45 hours required. Prerequisites: SPED 400/SPED 500, SPED 411/SPED 511, and passing scores on Praxis Core Academic Skills for Educator Tests or equivalent as prescribed by the Virginia Board of Education.

SPED 630. Teaching Preschoolers with Disabilities. 3 Credits.

This course is designed to prepare students in curricula, materials and methods of instruction for preschool-aged (2 to 6 years) children with special needs. Programming for self-help, social, language, motor, and cognitive development are addressed. Data collection, program organization, and classroom planning are also covered. Practicum of 45 hours required. Prerequisites: SPED 400/SPED 500 and passing scores on Praxis Core Academic Skills for Educator Tests or equivalent as prescribed by the Virginia Board of Education.

SPED 631. Developmental and Ecological Assessment Strategies. 3 Credits.

This course provides students with the skills necessary for assessment of atypical early development as well as best practices in assessing functional skills in students with severe disabilities. Students will explore and give assessments to children from birth to 6 years of age and students with severe/multiple/profound disabilities. Practicum of 45 hours required. Prerequisites: SPED 400/SPED 500 and passing scores on Praxis Core Academic Skills for Educator Tests or equivalent as prescribed by the Virginia Board of Education.

SPED 633. Teaching Students with Severe Physical and Sensorimotor Disabilities. 3 Credits.

This course reviews techniques for working with students who have severe physical and sensorimotor disabilities. Emphasis is on proper positioning and handling for students with atypical motor/muscle development who function at developmental levels between birth and five years. Practicum of 45 hours required. Prerequisites: SPED 400/SPED 500 and passing scores on Praxis Core Academic Skills for Educator Tests or equivalent as prescribed by the Virginia Board of Education.

SPED 634. Capstone Seminar. 3 Credits.

Capstone seminar.

SPED 637. Infant/Family Intervention and Teamwork. 3 Credits.

This course prepares professionals from cross-discipline backgrounds to serve families with children who are at-risk and disabled from birth through age three. Emphasis is placed on the development of the individualized family service plan (IFSP), procedures, materials and curriculum for this population. A family-centered approach is stressed. Practicum of 45 hours required. Prerequisites: SPED 400/SPED 500, SPED 630, and passing scores on Praxis Core Academic Skills for Educator Tests or equivalent as prescribed by the Virginia Board of Education.

SPED 638. Teaching Methods for Students with Visual Impairments. 3 Credits.

Emphasizes methods of teaching compensatory skills, the core curriculum, and technology for use by students who are blind and visually impaired. Addresses curriculum development, adaptations, and teaching methodology for individuals with visual impairments. Provides information on adaptations within various educational programs and adaptation of general education classroom materials and procedures for use with blind and low vision children and youth. Practicum requires a minimum of 10 hours. Prerequisites: passing scores on Praxis Core Academic Skills for Educator Tests or equivalent as prescribed by the Virginia Board of Education. Pre- or corequisite: SPED 400/SPED 500 and SPED 432/SPED 532.

SPED 639. Braille Reading and Writing. 3 Credits.

This course provides basic instruction on transcription of advanced Braille codes, including: music, foreign language, chemistry, computer Braille, and Nemeth Code (Braille math code). Introduces techniques for teaching skills in each code. Explores technology tools used to create Braille and tactile materials in addition to other assistive technologies used for instruction in math and science. Practicum requires a minimum of 15 hours. Prerequisites: SPED 433/SPED 533 and passing scores on Praxis Core Academic Skills for Educator Tests or equivalent as prescribed by the Virginia Board of Education. Pre- or corequisite: SPED 400/SPED 500 and SPED 432/SPED 532.

SPED 640. Applied Behavior Analysis: Principles, Procedures, and Philosophy. 3 Credits.

This course focuses on basic principles and procedures of applied behavior analysis; identification of factors that contribute to behavioral problems and improved performance; and procedures that can be used to minimize behavioral problems, improve performance, teach new behaviors, and increase probability of behaviors occurring under appropriate circumstances. Prerequisites: Permission of the instructor.

SPED 641. Applied Behavior Analysis: Empirical Bases. 3 Credits.

This course focuses on basic content of applied behavior analysis. This course teaches how to implement behavioral procedures and develop behavioral programs for clients with fundamental behavioral needs. Pre- or corequisite: SPED 640 or permission of the instructor.

SPED 642. Ethics and Professional Conduct for Behavior Analysts. 3 Credits.

This course provides a basis in Virginia Behavior Analyst Licensure law, the Behavior Analyst Certification Board's Guidelines for Responsible Conduct and Disciplinary Standards, and professional conduct consistent with the practice of applied behavior analysis. Prerequisites: SPED 640 or permission of the instructor.

SPED 643. Applied Behavior Analysis: Assessments and Interventions. 3 Credits.

This course further expands on basic content of applied behavior analysis and teaches how to implement behavioral procedures and develop behavioral programs for clients with fundamental behavioral needs. Prerequisites: SPED 640 or permission of the instructor.

SPED 644. Applied Behavior Analysis: Applications. 3 Credits.

This course expands capability to deal with more complex behavioral situations, enabling ability to relate to more sophisticated professional issues and environments. Prerequisites: SPED 640, SPED 641, and SPED 643 or consent of the instructor. Pre- or corequisite: SPED 643.

SPED 645. Applied Behavior Analysis: Verbal Behavior. 3 Credits.

This course further expands capability to deal with more complex behavioral situations, and enables students to relate to more sophisticated professional issues and environments. Prerequisites: SPED 643 or permission of the instructor.

SPED 669. Directed Field Internship Special Education, K-12. 1-6 Credits.

The course provides supervised involvement in a practicum setting where the student and the instructor work together closely to develop curricula and gain expertise in teaching specific topics of importance to special educators. 50 hours per credit. Prerequisites: appropriate graduate instructional strategies course work and passing scores on Praxis Core Academic Skills for Educator Tests or equivalent as prescribed by the Virginia Board of Education.

SPED 700. Social/Emotional Aspects of Child Development. 3 Credits.

The emphasis of this course is on the theoretical approaches to the social/emotional development of the child that include the psychodynamic, humanistic, cognitive, behavioral, and social learning models as applied to responsive practices that promote the healthy emotional wellbeing of children.

SPED 701. Historical and Contemporary Research in Special Education. 3 Credits.

This course covers contemporary and historical topics related to problem issues in special education. This is a course of study that will enable participants to examine various topics in special education and research a position on an issue.

SPED 702. Cognitive Processes and Learning Strategies for Students with Special Needs. 3 Credits.

The intent of this course is to provide an overview of research and critical issues relative to the cognitive and affective development of individuals with disabilities. Research-based interventions that address deficits of cognitive processes will be discussed and specific learning strategies will be presented.

SPED 705. Advanced Student and Program Evaluation in Special Education. 3 Credits.

The intent of this course is to provide scholars with the advanced knowledge of systems and theories of assessment, special education evaluation and eligibility determination, and the skill competence to design and implement research activities, instruction, and student and program evaluation. Scholars will access, evaluate, and use valid formative and summative assessment and evaluation measures for monitoring and promoting student learning and educational performance. Prerequisites: FOUN 611 and SPED 701.

SPED 707. Advanced Instructional Procedures in Special Education. 3 Credits.

This course provides students with advanced skills in educational planning, development, and implementation for students with learning problems. Techniques focus on inclusive and self-contained classroom arrangements. Prerequisite: graduate standing.

SPED 714. Alternative Strategies for Secondary Students. 3 Credits.

This course is designed to provide students with an opportunity to examine and develop curriculum strategies and adaptations which may be used to meet the needs of students with diverse learning needs. Practicum of 45 hours required. Prerequisites: SPED 400/SPED 500, SPED 415/SPED 515, and passing scores on Praxis I or equivalent as prescribed by the Virginia Board of Education.

SPED 715. Alternative Strategies for Elementary Students: Prevention and Intervention. 3 Credits.

The intent of this course is to provide pre-service and in-service teachers with the knowledge and skill to collaborate with other professionals to identify and remediate students who are at-risk for school problems due to academic challenges and/or behavior, and to effectively support students with identified mild disabilities in general education classrooms. The course focuses on developing proactive pre-referral interventions and working with general educators to develop and implement effective interventions, accommodations, modifications and supports for students with mild difficulties in general education classes. Prerequisites: SPED 400/SPED 500, SPED 415/SPED 515, and passing scores on Praxis I or equivalent as prescribed by the Virginia Board of Education.

SPED 720. Curriculum and Instruction: Research Into Practice. 3 Credits.

This course provides an overview of research methods employed in the field of special education. Current trends related to curriculum and instruction in general and special education will be investigated. Strategies and procedures for identifying learner characteristics and application of that knowledge will be included. Implementation of quality curricular modifications and/or instructional accommodations for students with diverse needs in a variety of educational settings and evaluation of instruction will be addressed. Prerequisites: SPED 400/SPED 500 or SPED 701/SPED 801.

SPED 769. Practicum in Applied Behavior Analysis. 3,6 Credits.

This course may be taken as an elective for students who complete the ABA certificate program and wish to complete the 15 total required practicum hours to sit for the National ABA Board Examination. Course can be repeated up to 5 times.

SPED 800. Social/Emotional Aspects of Child Development. 3 Credits.

The emphasis of this course is on the theoretical approaches to the social/emotional development of the child that include the psychodynamic, humanistic, cognitive, behavioral, and social learning models as applied to responsive practices that promote the healthy emotional wellbeing of children.

SPED 801. Historical and Contemporary Research in Special Education. 3 Credits.

This course covers contemporary and historical topics related to problem issues in special education. This is a course of study that will enable participants to examine various topics in special education and research a position on an issue.

SPED 802. Cognitive Processes and Learning Strategies for Students with Special Needs. 3 Credits.

The intent of this course is to provide an overview of research and critical issues relative to the cognitive and affective development of individuals with disabilities. Research-based interventions that address deficits of cognitive processes will be discussed and specific learning strategies will be presented.

SPED 807. Advanced Instructional Procedures in Special Education. 3 Credits.

This course provides students with advanced skills in educational planning, development, and implementation for students with learning problems. Techniques focus on inclusive and self-contained classroom arrangements. Prerequisite: graduate standing.

SPED 814. Alternative Strategies for Secondary Students. 3 Credits.

This course is designed to provide students with an opportunity to examine and develop curriculum strategies and adaptations which may be used to meet the needs of students with diverse learning needs. Practicum of 45 hours required. Prerequisites: SPED 400/SPED 500, SPED 415/SPED 515, and passing scores on Praxis I or equivalent as prescribed by the Virginia Board of Education.

SPED 815. Alternative Strategies for Elementary Students: Prevention and Intervention. 3 Credits.

The intent of this course is to provide pre-service and in-service teachers with the knowledge and skill to collaborate with other professionals to identify and remediate students who are at-risk for school problems due to academic challenges and/or behavior, and to effectively support students with identified mild disabilities in general education classrooms. The course focuses on developing proactive pre-referral interventions and working with general educators to develop and implement effective interventions, accommodations, modifications and supports for students with mild difficulties in general education classes. Prerequisites: SPED 400/SPED 500, SPED 415/SPED 515, and passing scores on Praxis I or equivalent as prescribed by the Virginia Board of Education.

SPED 820. Curriculum and Instruction: Research Into Practice. 3 Credits.

This course provides an overview of research methods employed in the field of special education. Current trends related to curriculum and instruction in general and special education will be investigated. Strategies and procedures for identifying learner characteristics and application of that knowledge will be included. Implementation of quality curricular modifications and/or instructional accommodations for students with diverse needs in a variety of educational settings and evaluation of instruction will be addressed. Prerequisites: SPED 400/SPED 500 or SPED 701/SPED 801.

SPED 821. Critical Issues I: Readings in Special Education and Professional Writing. 3 Credits.

The intent of this course is to provide doctoral candidates an opportunity to do the following: (a) become thoroughly involved in the literature relating to current critical issues in special education, and (b) begin the process of developing writing skills suitable for positions and tenure in higher education. The course stresses APA writing guidelines and style, conducting literature searches, and beginning development of a writing product that is suitable for publication. The course provides an introduction to the skills necessary for advancement in higher education and professional institutions.

SPED 822. Critical Issues II: Research and Professional Writing. 3 Credits.

Prerequisites: SPED 821. This course provides doctoral candidates an opportunity to read, analyze and synthesize research in special education with the intent to contributing to the literature. The course emphasizes skills necessary for developing writing skills suitable for positions and tenure in higher education. APA writing guidelines and style, analyzing and synthesizing research/literature, and producing a lengthy written product suitable for publication are stressed. The course is designed to build skills necessary for advancement in higher education and professional institutions.

SPED 868. Internship: Special Education. 3 Credits.

Internships in teaching, research, and other professional activities will provide experience in the roles that students will assume after completing their doctoral degrees. The successful completion of a 3-credit internship is required to fulfill program requirements and necessitates a commitment of a minimum of 150 contact hours. Internships may be at the regional, national or international levels.

SPED 869. Practicum/Field Experience. 6-12 Credits.

Supervised involvement of the doctoral-level student in a practicum setting, where the student and the instructor work together closely to develop curriculum and gain expertise in teaching specific topics of importance to early childhood educators. A weekly seminar is required.

SPED 893. Professional Seminar: Teaching, Research, and Service. 3 Credits.

Prerequisites: SPED 821 and SPED 822. This course prepares doctoral candidates to meet professional standards in teaching, research and service in special education in higher education institutions. Teaching includes an understanding of adult learning and the design, delivery, evaluation of content, and use of technology in college teaching. Research includes recognizing and critically discussing scholarly work, systematically planning and preparing for research, and developing research proposals. Service includes identifying professional organizations and agencies and creating integrated professional development programs. The course is designed to build skills necessary for advancement in higher education and professional institutions.

SPED 899. Dissertation. 1-12 Credits.

Dissertation. Prerequisites: Successful defense of prospectus and admission to candidacy.

SPED 999. Early Childhood and Special Education 999. 1 Credit.

A one-hour pass/fail registration required of all graduate students to maintain active status during the final semester prior to graduation. After successfully passing the candidacy examination, all doctoral students are required to be registered for at least one graduate credit each term.

SRM - Sport and Recreation Management

SPORT AND RECREATION MANAGEMENT Courses

SRM 711. Theory and Application in Sport and Recreation. 3 Credits.

The course examines the concepts, theories and philosophies of sport and recreation. Discussion will focus on historic and current issues in sport and recreation. Information will be presented and discussed concerning the application of theories, and the role and function of sport and recreation from the global to the local level. The class content will cover the major areas of the professions.

SRM 738. Fiscal Planning and Management in Sport and Recreation. 3 Credits.

This course is designed to examine the principles and practices of financial management in diverse sport and recreation service settings. This course will explore the basic concepts of financial planning and analysis required to effectively manage a successful operation. The concepts covered in this course include finance, economics, accounting, and general business practices. The course is intended to offer a broad perspective of sport finance along with the basic skills associated with fiscal planning and management. Students will gain an understanding of the core principles associated with the financial management of sport and recreation enterprises.

SRM 746. Sport and Recreation Marketing. 3 Credits.

This course will familiarize the student with theoretical and practical aspects of sports and recreation marketing including the dynamic nature of sport and recreation marketing and the importance of branding. Through lecture and case-study analysis, the course will provide students with an understanding of the importance of marketing and consumer behavior theory and fundamentals specific to the marketing of sport and recreation. The course is also designed to introduce students to marketing within the sport and recreation industry, including understanding the unique aspects of sport and recreation as product, the sport and recreation consumer market and the sport product market.

SRM 750. Ethics in Sport and Recreation Management. 3 Credits.

This course is designed to provide students with an understanding of ethics and morals and how each applies in sport and recreation management settings. This course will include the study of theoretical models of moral development. In addition, teleological and deontological theories of ethics will be examined with special application made to the sports and recreation environments. Models of ethical analysis, codes of ethics, and the development of a personal and administrative philosophy will also be emphasized.

SRM 752. Facility Management for Sport and Recreation. 3 Credits.

This course examines the principles of facility operation for sport, recreation, and entertainment events. It will provide students with an understanding of the unique challenges and opportunities commonly faced by facility managers. Students will analyze current research related to planning, funding, and operating sport/recreation facilities.

SRM 753. Sponsorship and Event Planning. 3 Credits.

This course focuses on two separate yet related topics: sponsorship and event planning. Many events in today's marketplace forge partnerships with sponsors to provide benefits that are favorable to both parties. This course is designed to provide students with a detailed examination of the relationship between sport or leisure events and corporate sponsorship. In addition, this course will cover many aspects associated with planning an event such as working with stakeholders, budgeting, selecting a site, marketing and presenting the event.

SRM 755. Social Issues in Sport and Recreation. 3 Credits.

The course will examine the nature and scope of sport and leisure from sociological, historical, economic, and philosophical perspectives. Special emphasis will be placed on studying selected issues and topics that impact sport and recreation managers and their understanding of the role that sport, recreation, and leisure play in society. Sport, recreation and leisure related topics include commercialism, deviance, drugs, gender, mass media, Olympic Movement, politics, race, religion, social class, social mobility, gambling, special populations, violence, youth sports, and the future of sport, recreation, and leisure.

SRM 760. Legal Aspects of Sport and Recreation. 3 Credits.

Course will introduce students to various aspects of the legal system as it relates to the management and supervision of sport and recreation facilities, programs, participants, spectators and events.

SRM 764. Field Experience in Sport and Recreation Management. 6 Credits.

Designed to provide detailed practical experience (400 clock hours) in a sport or recreation management field setting.

SRM 775. Management and Leadership in Sport and Recreation. 3 Credits.

This course will examine various management and leadership principles as they apply to sport and recreation settings. Special emphasis will be placed on studying leadership theories, management objectives, planning, decision making, problem-solving, and staffing in sport and recreation.

SRM 780. Youth Development in Sport and Recreation. 3 Credits.

The Positive Youth Development (PYD) movement has been greatly influenced by sport and recreation. With the recent increase of diabetes, obesity, sedentary lifestyles, and risky behaviors among youth, sport and recreation professionals are charged to help alleviate these societal issues. More specifically, practitioners need to target the socio-emotional needs of our youth through the sport and recreation experience. By using class lectures, technology, video, and self-directed research, students will explore research, theory, practice, and techniques of structuring positive experiences for youth. This course includes the examination of theories on youth development, behavior management, motivation, resiliency, and social skills as they relate to the sport and recreation experience.

SRM 797. Independent Study in Sport and Recreation Management. 1-3 Credits.

Independent study in sport and recreation management. Problems approved in advance are investigated under the supervision of a faculty member. Prerequisites: Approval of instructor required.

SRM 811. Theory and Application in Sport and Recreation. 3 Credits.

The course examines the concepts, theories and philosophies of sport and recreation. Discussion will focus on historic and current issues in sport and recreation. Information will be presented and discussed concerning the application of theories, and the role and function of sport and recreation from the global to the local level. The class content will cover the major areas of the professions.

SRM 838. Fiscal Planning and Management in Sport and Recreation. 3 Credits.

This course is designed to examine the principles and practices of financial management in diverse sport and recreation service settings. This course will explore the basic concepts of financial planning and analysis required to effectively manage a successful operation. The concepts covered in this course include finance, economics, accounting, and general business practices. The course is intended to offer a broad perspective of sport finance along with the basic skills associated with fiscal planning and management. Students will gain an understanding of the core principles associated with the financial management of sport and recreation enterprises.

SRM 846. Sport and Recreation Marketing. 3 Credits.

This course will familiarize the student with theoretical and practical aspects of sports and recreation marketing including the dynamic nature of sport and recreation marketing and the importance of branding. Through lecture and case-study analysis, the course will provide students with an understanding of the importance of marketing and consumer behavior theory and fundamentals specific to the marketing of sport and recreation. The course is also designed to introduce students to marketing within the sport and recreation industry, including understanding the unique aspects of sport and recreation as product, the sport and recreation consumer market and the sport product market.

SRM 850. Ethics in Sport and Recreation Management. 3 Credits.

This course is designed to provide students with an understanding of ethics and morals and how each applies in sport and recreation management settings. This course will include the study of theoretical models of moral development. In addition, teleological and deontological theories of ethics will be examined with special application made to the sports and recreation environments. Models of ethical analysis, codes of ethics, and the development of a personal and administrative philosophy will also be emphasized.

SRM 853. Sponsorship and Event Planning. 3 Credits.

This course focuses on two separate yet related topics: sponsorship and event planning. Many events in today's marketplace forge partnerships with sponsors to provide benefits that are favorable to both parties. This course is designed to provide students with a detailed examination of the relationship between sport or leisure events and corporate sponsorship. In addition, this course will cover many aspects associated with planning an event such as working with stakeholders, budgeting, selecting a site, marketing and presenting the event.

SRM 855. Social Issues in Sport and Recreation. 3 Credits.

The course will examine the nature and scope of sport and leisure from sociological, historical, economic, and philosophical perspectives. Special emphasis will be placed on studying selected issues and topics that impact sport and recreation managers and their understanding of the role that sport, recreation, and leisure play in society. Sport, recreation and leisure related topics include commercialism, deviance, drugs, gender, mass media, Olympic Movement, politics, race, religion, social class, social mobility, gambling, special populations, violence, youth sports, and the future of sport, recreation, and leisure.

SRM 860. Legal Aspects of Sport and Recreation. 3 Credits.

Course will introduce students to various aspects of the legal system as it relates to the management and supervision of sport and recreation facilities, programs, participants, spectators and events.

SRM 864. Sport and Recreation Marketing. 3 Credits.

This course will familiarize the student with theoretical and practical aspects of sports and recreation marketing including the dynamic nature of sport and recreation marketing and the importance of branding. Through lecture and case-study analysis, the course will provide students with an understanding of the importance of marketing and consumer behavior theory and fundamentals specific to the marketing of sport and recreation. The course is also designed to introduce students to marketing within the sport and recreation industry, including understanding the unique aspects of sport and recreation as product, the sport and recreation consumer market and the sport product market.

SRM 875. Management and Leadership in Sport and Recreation. 3 Credits.

This course will examine various management and leadership principles as they apply to sport and recreation settings. Special emphasis will be placed on studying leadership theories, management objectives, planning, decision making, problem-solving, and staffing in sport and recreation.

SRM 880. Youth Development in Sport and Recreation. 3 Credits.

The Positive Youth Development (PYD) movement has been greatly influenced by sport and recreation. With the recent increase of diabetes, obesity, sedentary lifestyles, and risky behaviors among youth, sport and recreation professionals are charged to help alleviate these societal issues. More specifically, practitioners need to target the socio-emotional needs of our youth through the sport and recreation experience. By using class lectures, technology, video, and self-directed research, students will explore research, theory, practice, and techniques of structuring positive experiences for youth. This course includes the examination of theories on youth development, behavior management, motivation, resiliency, and social skills as they relate to the sport and recreation experience.

SRM 897. Independent Study in Sport and Recreation Management. 1-3 Credits.

Independent study in sport and recreation management. Problems approved in advance are investigated under the supervision of a faculty member.

SRM 999. Sport and Recreation Management 999. 1 Credit.

A one-hour pass/fail registration required of all graduate students to maintain active status during the final semester prior to graduation. After successfully passing the candidacy examination, all doctoral students are required to be registered for at least one graduate credit each term until the degree is complete.

STAT - Statistics

STATISTICS Courses

STAT 505. Introduction to Data Handling. 3 Credits.

Use of SAS and R to handle data sets. Topics for SAS include data input, creating permanent data sets, merging data sets, creating new variables, sorting, printing, charting, formatting, IML programming, macro programming, and an overview of proc SQL and other statistical procedures. Topics for R include data structure, control structure, writing functions, and graphics. Prerequisites: A grade of C or better in STAT 130M or equivalent, and a grade of C or better in MATH 316 or equivalent, or permission of the instructor.

STAT 531. Theory of Statistics. 3 Credits.

Topics include point and interval estimation, tests of hypotheses, introduction to linear models, likelihood techniques, and regression and correlation analysis. Prerequisites: A grade of C or better in STAT 331 or permission of the instructor.

STAT 532. Sampling Theory. 3 Credits.

Sampling from finite populations is discussed. Topics such as simple random sampling, stratified random sampling and ratio and regression estimation are included. Also discussed are aspects of systematic sampling, cluster sampling, and multi-stage sampling. Prerequisites: A grade of C or better in STAT 431/STAT 531.

STAT 535. Design and Analysis of Experiments. 3 Credits.

Topics include analysis of variance with one or more factors, multiple comparisons, randomized blocks, Latin squares and related designs: multifactor factorial experiments; blocking and confounding in the 2(k) factorial design; two-level fractional factorial designs. Statistical software will be used to analyze real life data. Prerequisites: A grade of C or better in STAT 405 or STAT 505 and STAT 437 or STAT 537.

STAT 537. Applied Regression Analysis. 3 Credits.

Topics include theory of least squares, simple linear regression, multiple regression (including its matrix formulation), applications of these techniques to real life data, residual analysis, selection of variables, multicollinearity issues, regression on dummy variables, and analysis of covariance. Prerequisites: A grade of C or better in STAT 531. Pre- or corequisite: STAT 405 or STAT 505.

STAT 540. Clinical Trials. 3 Credits.

An introduction to statistical methods used in the design, conduct, and analysis of clinical trials. Topics include: study designs, treatment allocation, sample size and power, clinical life tables, log rank test, cross-over designs, and sequential methods of monitoring clinical trials. Prerequisites: A grade of C or better in STAT 431 or STAT 531.

STAT 542. Environmental Statistics. 3 Credits.

Topics include nonlinear and generalized linear models, quantitative risk assessment, analysis of stimulus-response and spatially correlated data, methods of combining data from several independent studies. Regression settings are emphasized where one or more predictor variables are used to make inferences on an outcome variable of interest. Applications include modeling growth inhibition of organisms exposed to environmental toxins, spatial associations of like species, risk estimation, and spatial prediction. SAS is used extensively in the course. Prerequisites: A grade of C or better in STAT 431 or STAT 531; STAT 437 or STAT 537 recommended.

STAT 547. Analysis of Longitudinal Data. 3 Credits.

Topics include general linear models, weighted least squares (WLS), maximum likelihood (ML), restricted maximum likelihood (REML) methods of estimation, analysis of continuous response repeated measures data, parametric models for covariance structure, generalized estimating equations (GEE) and quasi least squares (QLS), models for discrete longitudinal data: marginal, random effects, and transition models. Limitations of existing approaches will be discussed. Emphasis will be on the application of these tools to data related to the biological and health sciences. Methods will be implemented using statistical software. Prerequisites: A grade of C or better in STAT 431 or STAT 531. Pre- or corequisite: STAT 405 OR STAT 505.

STAT 549. Nonparametric Statistics. 3 Credits.

Topics include the theory and applications of binomial tests and rank tests, including the tests of McNemar, Mann-Whitney, Friedman, Kruskal-Wallis, and Smirnov. Prerequisites: A grade of C or better in STAT 330 or STAT 331 or departmental permission.

STAT 550. Categorical Data Analysis. 3 Credits.

Topics include relative risk and odds ratio measures for 2 x 2 tables, the chi-square and Mantel-Haenszel tests, Fisher's exact test, analysis of sets of 2 x 2 tables using Cochran-Mantel-Haenszel methodology, analysis of I x J and sets of I x J tables for both nominal and ordinal data, logistic regression including the logit and probit models, and building and applying loglinear models. Emphasis will be on the application of these statistical tools to data related to the health and social sciences. Interpretation of computer output will be stressed. Prerequisites: A grade of C or better in STAT 431 or STAT 531.

STAT 560. Statistical Simulation/Programming Using Statistical Software Packages. 3 Credits.

This course is a data-based tour of advanced statistical techniques using software packages, exploring a catalog of data sets (simulated or otherwise) spanning a variety of fields and applications, including data suitable for regression, ANOVA, time series modeling, longitudinal data analysis and multivariate techniques. Approaches will include parametric, nonparametric, simulation, and bootstrapping. SAS and R (S-plus) will be used extensively, with some other specialized products. For writing actual (not packaged) code, PROC IML and R will be used. This is a finishing course for applied statisticians, highly recommended for students planning a career in statistical programming and simulation. Prerequisites: A grade of C or better in STAT 505 and two of STAT 535, STAT 537, STAT 547 and STAT 550.

STAT 597. Topics in Statistics. 1-3 Credits.

The advanced study of selected topics. Prerequisites: permission of the instructor.

STAT 613. Applied Statistical Methods I. 3 Credits.

Intended for graduate students in all academic disciplines; not available for credit to graduate students in the Department of Mathematics and Statistics. Topics include descriptive statistics, probability computations, estimation, hypothesis testing, linear regression, analysis of variance and categorical data analysis. Emphasis will be on statistical analysis of data arising in a research setting. The rationale for selecting methods to address research questions will be emphasized. Examples will be given from the health sciences, social sciences, engineering, education and other application areas. Prerequisites: A grade of C or better in STAT 130M or STAT 330 or MATH 211 or MATH 226 or permission of the instructor.

STAT 625. Mathematical Statistics I. 3 Credits.

625 is prerequisite to 626. Lecture 3 hours; 3 credits each semester. Prerequisite: STAT 531. An introduction to probability and statistical inference. Topics include probability, conditional probability, Bayes formula, random variables, stochastic independence, expectation, moment generating functions, transformations. Limit theorems and convergence concepts, point and interval estimation, hypothesis testing, correlation and regression analyses, nonparametric statistics, sufficiency, Neyman-Pearson Lemma, and the Cramer-Rao inequality.

STAT 626. Mathematical Statistics II. 3 Credits.

625 is prerequisite to 626. Lecture 3 hours; 3 credits each semester. Prerequisite: STAT 531. An introduction to probability and statistical inference. Topics include probability, conditional probability, Bayes formula, random variables, stochastic independence, expectation, moment generating functions, transformations. Limit theorems and convergence concepts, point and interval estimation, hypothesis testing, correlation and regression analyses, nonparametric statistics, sufficiency, Neyman-Pearson Lemma, and the Cramer-Rao inequality.

STAT 627. Linear Statistical Models. 3 Credits.

Topics include the multivariate normal distribution, distributions of quadratic forms, the general linear model, estimability, the Gauss-Markov theorem and general linear hypotheses, analysis of variance (ANOVA) and covariance (ANCOVA) with special attention to unbalanced data, and analysis of mixed effects and variance components models including repeated measures and split-plot designs. Prerequisites: STAT 626.

STAT 628. Applied Multivariate Analysis. 3 Credits.

Topics include the multivariate normal distribution, graphical display of multivariate data and tests for normality, Hotelling's T², multivariate analysis of variance (MANOVA) and regression, profile analysis, growth curve models, canonical correlation analysis, principal components, factor models, clustering, and discriminant analysis. All methods are implemented using the SAS statistical software. Prerequisites: STAT 537 or STAT 627 or permission of the instructor.

STAT 630. Time Series Models. 3 Credits.

This course examines the principles and concepts of time series and forecasting. Study includes theory, methods, and model parameter estimation taking into account correlation and autocorrelation structures with data applications from pollution, economics, seasonal trends, and the stock market. Notions of autoregressive, moving, average, stationary and nonstationary ARIMA models will be discussed. The multivariate version and state-space models will also be introduced. Simulation of time series data will be discussed in depth. Prerequisites: STAT 626, STAT 505, and STAT 537.

STAT 632. Master's Project. 3 Credits.

Under the guidance of a faculty member in the Department of Mathematics and Statistics, the student will undertake a significant data analysis problem in a scientific setting outside the department. A written report and/or public presentation of results will be required. Prerequisites: permission of graduate program director.

STAT 635. Statistical Consulting. 3 Credits.

This course is intended to teach statistical consulting techniques to graduate students in statistics. Students are expected to work on statistical consulting problems brought by faculty and graduate students in various fields. Prerequisites: STAT 626.

STAT 640. Survival Analysis. 3 Credits.

Survival time models, clinical life tables, nonparametric methods for estimating survival functions, Cox regression, survival distributions, mathematical and graphical methods for goodness of fit, proportional hazards models, comparison of treatment groups, regression models. Prerequisite: STAT 626.

STAT 667. Cooperative Education. 1-3 Credits.

1-3 credits. Student participation for credit based on academic relevance of the work experience, criteria, and evaluative procedures as formally determined by the department and the cooperative education program prior to the semester in which the work experience is to take place.

STAT 697. Topics in Statistics. 1-3 Credits.

Advanced study of selected topics. Prerequisites: permission of the instructor.

STAT 727. Statistical Inference I. 3 Credits.

Topics include group and exponential families, sufficiency, unbiasedness, equivariance, properties of estimators, large sample theory, maximum likelihood estimation, EM algorithm, asymptotic optimality, information inequality, decision theory, minimax, admissibility, Bayes estimates, generalized Neyman-Pearson Lemma, uniformly most powerful tests, unbiased tests, invariant tests, and Bayesian tests. Prerequisites: A grade of C or better in MATH 517 and STAT 626.

STAT 728. Statistical Inference II. 3 Credits.

Topics include group and exponential families, sufficiency, unbiasedness, equivariance, properties of estimators, large sample theory, maximum likelihood estimation, EM algorithm, asymptotic optimality, information inequality, decision theory, minimax, admissibility, Bayes estimates, generalized Neyman-Pearson Lemma, uniformly most powerful tests, unbiased tests, invariant tests, and Bayesian tests. Prerequisites: A grade of C or better in MATH 517 and STAT 626.

STAT 795. Seminar in Statistics. 1-3 Credits.

1-3 credits. Prerequisite: permission of the instructor.

STAT 797. Topics in Statistics. 1-3 Credits.

Advanced study of selected topics. Prerequisites: Permission of the instructor.

STAT 827. Statistical Inference I. 3 Credits.

Topics include group and exponential families, sufficiency, unbiasedness, equivariance, properties of estimators, large sample theory, maximum likelihood estimation, EM algorithm, asymptotic optimality, information inequality, decision theory, minimax, admissibility, Bayes estimates, generalized Neyman-Pearson Lemma, uniformly most powerful tests, unbiased tests, invariant tests, and Bayesian tests. Prerequisites: A grade of C or better in MATH 517 and STAT 626.

STAT 828. Statistical Inference II. 3 Credits.

Topics include group and exponential families, sufficiency, unbiasedness, equivariance, properties of estimators, large sample theory, maximum likelihood estimation, EM algorithm, asymptotic optimality, information inequality, decision theory, minimax, admissibility, Bayes estimates, generalized Neyman-Pearson Lemma, uniformly most powerful tests, unbiased tests, invariant tests, and Bayesian tests. Prerequisites: A grade of C or better in MATH 517 and STAT 626.

STAT 895. Seminar in Statistics. 1-3 Credits.

1-3 credits. Prerequisite: permission of the instructor.

STAT 897. Topics in Statistics. 1-3 Credits.**STAT 898. Research. 1-9 Credits.****STAT 899. Dissertation. 1-9 Credits.****STAT 999. Statistics 999. 1 Credit.**

1 cr. Pass/Fail grading.

STEM - Science, Technology, Engineering, and Mathematics Education

SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS EDUCATION Courses

STEM 533. Developing Instructional Strategies PreK-6: Mathematics. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisites: 530. Following a theory into practice philosophy, students explore, develop, and use instructional strategies, materials, technologies, and activities to promote children's development of attitudes, behaviors, and concepts in mathematics in grades PreK-6 in support of NCTM national instructional standards and the Virginia Standards of Learning.

STEM 534. Developing Instructional Strategies PreK-6: Science. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisites: 530. Following a theory into practice philosophy, students explore, develop, and use instructional strategies, materials, technologies, and activities to promote children's development of attitudes, behaviors, and concepts in science in grades PreK-6 in support of AAAS national instructional standards and the Virginia Standards of Learning.

STEM 553. Developing Instructional Strategies for Teaching in the Middle/High School: Mathematics. 3 Credits.

Following a theory/research-into-practice philosophy, students explore, develop, and use instructional strategies, materials, technologies, and activities to promote the development of attitudes, behaviors, and concepts in mathematics, grades 6-12, in support of national instructional standards and the Virginia Standards of Learning; 35 hours of teaching practicum required. Prerequisites: TLED 530, or TLED 677, passing scores on PRAXIS I or equivalent SAT scores as established by VA Board of Education, a criminal background check, acceptance into teacher education, grade requirement in the specific content area and professional education core, minimum major and overall GPA of at least 2.75. (Additional prerequisites for MCTP students are ECI 608 and 616.).

STEM 554. Developing Instructional Strategies for Teaching in the Middle/High School: Science. 3 Credits.

Following a theory/research-into-practice philosophy, students explore, develop, and use instructional strategies, materials, technologies, and activities to promote the development of attitudes, behaviors, and concepts in science, grades 6-12, informed by national instructional standards and the Virginia Standards of Learning; 35 hours of teaching practicum required. Prerequisites: TLED 530, or TLED 677, passing scores on PRAXIS I or equivalent SAT scores as established by VA Board of Education, a criminal background check, acceptance into teacher education, grade requirement in the specific content area and professional education core, minimum major and overall GPA of at least 2.75. (Additional prerequisites for MCTP students are ECI 608 and 616.).

STEM 571. Communication Industries. 3 Credits.

Lecture 3 hours; 3 credits. A course designed to provide career and technical education teachers, industrial technologists, counselors, and administrators an opportunity to observe and enhance their knowledge of representative communication industries from the local region. (qualifies as a CAP experience).

STEM 572. Construction Industries. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: A course designed to provide career and technical education teachers, industrial technologists, counselors, and administrators an opportunity to observe and enhance their knowledge of representative construction industries from the local region. (qualifies as a CAP experience).

STEM 573. Manufacturing Industries. 3 Credits.

Lecture 3 hours; 3 credits. A course designed to provide career and technical education teachers, industrial technologists, counselors, and administrators an opportunity to observe and enhance their knowledge of representative manufacturing industries from the local region. (qualifies as a CAP experience).

STEM 574. Service Industries. 3 Credits.

Lecture 3 hours; 3 credits. A course designed to provide career and technical education teachers, industrial technologists, counselors, and administrators an opportunity to observe and enhance their knowledge of representative service industries from the local region. (qualifies as a CAP experience).

STEM 575. Transportation Industries. 3 Credits.

Lecture 3 hours; 3 credits. A course designed to provide career and technical education teachers, industrial technologists, counselors, and administrators an opportunity to observe and enhance their knowledge of representative transportation industries from the local region. (qualifies as a CAP experience).

STEM 586. Middle School Student Teaching for Technology Education. 6 Credits.

6 credits. Prerequisites: SEPS 508, 596, 788, STEM 730, TLED 608, 616, READ 680 for graduate students. Passing scores on PRAXIS I or State Board of Education-approved SAT or ACT scores and passing scores on the appropriate PRAXIS II content examination are required. Classroom placement for student teaching in a middle school technology laboratory. Students apply content and methodology under the supervision of a cooperating teacher and university faculty member. Available for pass/fail grading only. (qualifies as a CAP experience).

STEM 595. Topics. 1-3 Credits.

STEM 651. Differentiation of Mathematics Instruction for Diverse Student Populations. 3 Credits.

Lecture 3 hours, 3 credits. Adapting the mathematics teaching and learning practices to accommodate diverse populations will be explored. The essential knowledge and understanding needed by mathematics specialists to assist classroom teachers in effectively utilizing differentiated instruction will be highlighted.

STEM 653. Mathematics in the Elementary/Middle School. 3 Credits.

Lecture 3 hours; 3 credits. Presents an overview of the content and structure of the various mathematics curricula. Methods of teaching mathematics in the elementary and middle school are introduced with special emphasis on technology in the mathematics classroom.

STEM 654. Science in the Elementary/Middle School. 3 Credits.

Lecture 3 hours; 3 credits. Current developments and educational research are applied to instructional methodology with an emphasis on hands-on activities in the school science curriculum.

STEM 655. Culturally Responsive Classroom. 3 Credits.

Lecture 3 hours, 3 credits. This course will focus on the following elements of effective teaching practice: understanding discipline specific content and methods, employing best-practice strategies to teach discipline specific skills and concepts, assessing student learning, legal and safety issues, use of technology, issues of diversity, engagement with the community, and strategies for continuing to grow as a teacher and learner.

STEM 658. Math Methods for Middle and Secondary School. 3 Credits.

Lecture 3 hours; 3 credits. For MCTP students only. Course will explore the basic building blocks necessary to develop effective teaching skills in the mathematics classroom. These skills, including a thorough knowledge of the appropriate level of content, relevancy, pedagogy-based research on how learning takes place, opportunities to use writing and reading techniques, manipulative tools, technology, and other resources vital to creating a learning community in the classroom, will be emphasized in academic discussion, observation and application. Exploration of effective, research-based mathematical teaching methodology and evaluation standards. Emphasis placed on strategies including cooperative learning, technology, manipulatives, cultural influences and cross content teaching strategies.

STEM 659. Science Methods for Middle and Secondary School. 3 Credits.

Lecture 3 hours; 3 credits. For MCTP students only. This course is designed to give prospective science teachers practical applications of current science instructional theories. The student will engage in the investigative nature of science through the exploration of philosophies, the use of research, laboratory experimentation, interactive technology, instructional methods, and assessment/evaluation techniques.

STEM 660. Action Research for Mathematics Specialists. 3 Credits.

Lecture 3 hours; 3 credits. Departmental approval required. Action Research is introduced as a means to conduct classroom-based studies in the context of mathematics. The practical nature of research methods that mathematics specialists can use in conjunction with their mathematics instructional program is emphasized.

STEM 661. Mathematics Specialists as Teacher Leaders. 3 Credits.

Lecture 3 hours, 3 credits. The critical characteristics and responsibilities of Mathematics Specialists as teacher leaders will be explored. Structuring classroom assistance through peer coaching, mentoring, observations and conferencing will be highlighted to expand the prospective Mathematics Specialists' leadership capacity.

STEM 662. Mathematical Assessment for Data Driven Decisions. 3 Credits.

Lecture 3 hours, 3 credits. Selected key differences between assessment for and of learning will be examined as a means to provide rich descriptions of student learning. Designing and using quality assessment systems to inform instructional decisions and guide student learning will serve as a framework for Mathematics Specialists.

STEM 668. Internship for Mathematics Specialist. 3 Credits.

Prerequisites: MATH 303 and MATH 335. An internship experience that provides mathematics specialists an opportunity to develop the necessary knowledge, skills and dispositions to impact and improve the mathematics program of schools. Requires 150 hours of internship.

STEM 720. STEM Educational Foundations. 3 Credits.

Lecture, 3 hours; 3 credits. A multidisciplinary course designed to provide insights about the fundamental concepts and basis for STEM education programs. Standards for the school subjects of science, technology, engineering education and mathematics literacy will be reviewed. Connections between these subjects will be explored.

STEM 721. Science, Technology, Engineering, and Mathematics Connection and Integration. 3 Credits.

Lecture, 3 hrs. 3 credits. Prerequisite: STEM 720 or 820. A course designed to teach how to plan integrated STEM curriculum and instructional materials. A review of projects that have undertaken STEM integration will be made. Students will learn how to map STEM content and then design STEM integrated curriculum and instructional materials.

STEM 730. Introduction to Technology. 3 Credits.

3 credits. Order and structure the discipline of technology by identifying and analyzing the component parts and examining technical means as critical variables in the affairs of humankind. Based on the Standards for Technological Literacy.

STEM 731. Technical Systems. 3 Credits.

3 credits. Analyze the technical concepts common and unique to the technical systems of technology.

STEM 732. Program Development for Technology Education. 3 Credits.

3 credits. Plan and develop effective program in technology related activities. Focus is on identification and development of resources, activities, and materials for classroom programs.

STEM 795. Topics. 1-3 Credits.

STEM 820. STEM Educational Foundations. 3 Credits.

Lecture, 3 hours; 3 credits. A multidisciplinary course designed to provide insights about the fundamental concepts and basis for STEM education programs. Standards for the school subjects of science, technology, engineering education and mathematics literacy will be reviewed. Connections between these subjects will be explored.

STEM 821. Science, Technology, Engineering, and Mathematics Connection and Integration. 3 Credits.

Lecture, 3 hrs. 3 credits. Prerequisite: STEM 720 or 820. A course designed to teach how to plan integrated STEM curriculum and instructional materials. A review of projects that have undertaken STEM integration will be made. Students will learn how to map STEM content and then design STEM integrated curriculum and instructional materials.

STEM 830. Introduction to Technology. 3 Credits.

3 credits. Order and structure the discipline of technology by identifying and analyzing the component parts and examining technical means as critical variables in the affairs of humankind. Based on the Standards for Technological Literacy.

STEM 831. Technical Systems. 3 Credits.

3 credits. Analyze the technical concepts common and unique to the technical systems of technology.

STEM 832. Program Development for Technology Education. 3 Credits.

3 credits. Plan and develop effective program in technology related activities. Focus is on identification and development of resources, activities, and materials for classroom programs.

STEM 895. Topics. 3 Credits.

TAX - Taxation

TAXATION Courses

TAX 650. Tax Strategies for Business Decisions. 3 Credits.

Lecture 3 hours; 3 credits. An intensive course in taxation. Focuses on the choice of business entity by covering taxation of corporations (both C and S corporations), partnerships and sole proprietor-ships. The course emphasizes research skills and professional ethics.

TAX 651. Taxation of Corporations I. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: ACCT 521 or equivalent. Covers federal income taxation of corporations and shareholders. Includes organizing a corporation; establishing capital structure; determining tax liability; dividends and other non-liquidating distributions; stock redemptions; and liquidations.

TAX 652. Taxation of Partners and Partnerships. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: ACCT 521 or equivalent. Taxation of partners and partnerships: formation, termination, distributions and liquidations, and sales of partnership interests. Limited partnerships in conjunction with their use as tax shelters, and the multifaceted attributes of family partnerships.

TAX 653. Taxation of Estates and Gifts. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: ACCT 521 or equivalent. Examines transfers under federal estate and gift tax laws. Includes property owned by the decedent; retained life estates; transfers taking effect at death; transfers with retained powers; concurrent property interest; powers of appointment; valuation problems; expenses, debts, and taxes; charitable bequests; marital deduction; taxable inter vivos gifts; gift splitting and credits; consideration of Chapter 14 and asset freezing techniques; and transfer taxation of life insurance.

TAX 654. Income Taxation of Estates, Trusts & Beneficiaries. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: TAX 653. Examines simple, complex, and revocable trusts; trusts accumulation distributions; income in respect of decedents; trust accounting income; distributable net income; terminations; excess deductions; basis rules; and the decedent's final income tax return.

TAX 655. Taxation of Corporations II. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: TAX 651. Analyzes the different types of taxable and tax-free acquisitions and reorganizations. Includes determining tax consequences for corporations and shareholders involved in an acquisition or reorganization and analyzing necessary requirements for a tax-free corporate division (spin-off). Covers aspects of filing consolidated federal income tax returns.

TAX 656. Taxation of Deferred Compensation. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: TAX 651. Discusses federal income taxation of deferred compensation plans with emphasis on qualified retirement plans. Reviews plan qualification requirements, reporting and disclosure requirements, and distribution rules. Includes discussion of specific types of plans such as Sec. 401(K) and ESOPs.

TAX 657. State and Local Taxation. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: ACCT 521 or equivalent. Examines state levying of individual income, corporate income, property, sales, and excise taxes.

TAX 658. Tax Aspects of International Business. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: ACCT 521 or equivalent. Taxation of foreign persons conducting business in the U.S. including FIRPTA, source of income rules, and residency requirements; taxation of U.S. individuals and businesses doing business abroad including FSCs, CFCs, FHP Co's and possessions corporations.

TAX 660. Taxation of Property Transactions. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: ACCT 521 or equivalent. Covers determination of realized and recognized gains and losses and their tax treatment on property dispositions. Includes consequences of property transactions, such as depreciation, depletion, basis and capital gains problems.

TAX 661. Taxation of the Small Business Corporation. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: ACCT 521 or equivalent. Covers federal income taxation of S corporations including election eligibility; termination of status; treatment of income and deduction items; distributions; and basis of stock and debt. Also discusses compensation arrangements in closely held corporations; fiscal year issues; personal service corporations; the advantages of C corporations versus S corporations; corporation liquidation and redemption rules; and the S corporations's built-in gains tax.

TAX 662. Tax Procedure and Practice. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: ACCT 521 or equivalent. Discusses procedures for dealing with the IRS. Includes sources of IRS policy; processing returns; auditing returns; rulings and determination letters; assessments and collections; and interest and civil penalties.

TAX 695. Selected Topics in Taxation. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: ACCT 521 or equivalent. Examines the unique rules applicable to federal taxation of farmers and ranchers. Also, covers the basics on the new Limited Liability Company and Virginia law on LLCs. Topics may vary each year.

TAX 697. Independent Study. 3 Credits.

3 credits. Prerequisites: ACCT 521 or equivalent and approval of instructor. Individually supervised research projects in selected tax areas. Approval of supervising professor as to topic and evaluation of project required at time of registration.

THEA - Theatre

THEATRE Courses

THEA 541. American Theatre. 3 Credits.

A study of dramatic theories and theatre practices as they relate to the development and growth of theatrical art in the United States.

THEA 542. Principles of Directing. 3 Credits.

An examination and practical application of principles of stage direction as influenced by play script, acting talent, set and lighting design, and the technical facilities of production organizations.

THEA 543. Acting Three. 3 Credits.

An advanced scene study class exploring issues of style and period pertinent to portraying characters on stage. Prerequisite: THEA 152, THEA 252 or permission of instructor.

THEA 545. Experimental Theatre. 3 Credits.

An in-depth study of avant-garde theatre scripts and performance techniques from 1900 to the present. Prerequisite: THEA 230 or permission of instructor.

THEA 547. Women in Theatre. 3 Credits.

A study of the contributions women have made to the theatre as actresses, directors/managers, designers, and playwrights, and of their creative problems and methodologies.

THEA 549. Script and Performance Analysis. 3 Credits.

Approaches script and performance analysis by examining the separate elements of action, character, language, music, spectacle or "mise en scene" in order to discover play spine and style as a basis for staging the play. Also examines the method of "scoring a role" or finding character motivations in relation to overall play spine.

THEA 552. Acting Four. 3 Credits.

An advanced scene study class exploring issues of style and period pertinent to portraying characters on stage.

THEA 571. International Film History. 3 Credits.

An examination of world cinema as a technology, a business, an institution, and an art form from its inception to the present. Emphasis is on the narrative fiction film, its technological and aesthetic development, economic organization, and socio-cultural context. Representative classic and contemporary works will be screened and analyzed.

THEA 579. American Film History. 3 Credits.

An examination of American motion pictures as an art form, a business and an institution from its inception to the present. Primary attention is accorded to the narrative fiction film, its aesthetic and technological development, economic organization and social impact. This course highlights the many connections between film history and American culture.

THEA 580. The Video Documentary II. 3 Credits.

A production/studio course designed to complement the work developed in Theatre 380: The Video Documentary I. Discussion/presentation topics range from production field work to post-production editing. The final third of the semester will be devoted to compiling the rough footage in post production.

THEA 586. Advanced Filmmaking. 3 Credits.

Offers the advanced film/video maker an opportunity to produce a project beyond the scope of previous classroom projects.

THEA 595. Topics in Theatre. 1-3 Credits.

The advanced study of selected topics designed to permit small groups of qualified students to work on subjects of mutual interest which, due to their specialized nature, may not be offered regularly. These courses will appear in the course schedule and will be more fully described by academic advisors.

THEA 596. Topics in Theatre. 1-3 Credits.

The advanced study of selected topics designed to permit small groups of qualified students to work on subjects of mutual interest which, due to their specialized nature, may not be offered regularly. These courses will appear in the course schedule and will be more fully described by academic advisors.

THEA 597. Tutorial Work in Special Topics in Theatre. 1-3 Credits.

Independent reading and study on a topic to be selected under the direction of an instructor. Conferences and papers as appropriate.

THEA 598. Tutorial Work in Special Topics in Theatre. 1-3 Credits.

Independent reading and study on a topic to be selected under the direction of an instructor. Conferences and papers as appropriate.

THEA 697. Tutorial Work in Special Topics in Theatre. 1-3 Credits.

Independent reading and study on a topic to be selected under the direction of an instructor. Conferences and papers as appropriate. Prerequisites: graduate standing and approval of the department chair.

THEA 698. Tutorial Work in Special Topics in Theatre. 1-3 Credits.

Independent reading and study on a topic to be selected under the direction of an instructor. Conferences and papers as appropriate. Prerequisites: graduate standing and approval of the department chair.

TLCI - Teaching & Learning - Curriculum & Instruction

TCHNG LRNG - CURRIC INSTR Courses

TLCI 702. Historical and Contemporary Perspectives on Education. 3 Credits.

Lecture, 3 hours; 3 credits. The present educational system, its social impact and future implications are viewed in historical, philosophical, and sociological perspectives. Special attention is given to technology, research, multicultural education/equity and leadership.

TLCI 703. Perspectives and Inquiry in Curriculum and Instruction. 3 Credits.

Lecture, 3 hours; 3 credits. This course introduces a range of methodologies, theoretical perspectives, and epistemologies in the field of curriculum and instruction. Students will gain strategies for critical reading, scholarly writing, and identify areas for prospective inquiry.

TLCI 704. Instruction Theories and Models. 3 Credits.

Lecture, 3 hours; 3 credits. Students will investigate a range of instructional theories and design theories in terms of learning domains and pedagogical approaches to the teaching/learning process in a variety of educational settings. Students will utilize a systematic design process grounded in theories and research to propose/develop instruction for specific learning goals related to their own professional situations.

TLCI 705. Critical Issues: Curriculum Research. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: graduate standing. Explores the relationship between the historical, philosophical, and sociopolitical influence on curriculum development and evaluation. Historical and cultural approaches to designing and implementing curricular models, curriculum reform, and understanding the politics of conceptualizing the curriculum process are highlighted. Major issues concerning educational curriculum reform are addressed and reviewed.

TLCI 710. Models of Parent, Child, Social Interaction. 3 Credits.

Lecture, 3 hours. 3 credits. This course will examine the family with an emphasis on parent/child interactions. In addition, a model for ecological intervention will be discussed.

TLCI 721. Advanced Curriculum Design and Development. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: graduate standing. Focuses on the process of building a curriculum, historical developments in curriculum design, alternative curricula, current and future trends in curricular innovations, and research in curriculum development.

TLCI 722. Curriculum Seminar in Content Areas. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: graduate standing. Investigates the role and nature of the curriculum for particular subject-matter specialties — e.g., math, social studies, science, English, school librarianship, reading, etc. Objectives are tailored to specific content areas.

TLCI 724. Readings in Contemporary Society. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: graduate standing. Surveys the literature related to the issues and trends in contemporary society and provides educators with a substantive base in the philosophy, history, theory, strategies and multicultural perspectives relevant to curriculum development.

TLCI 726. Advanced Supervision of Reading Programs. 3 Credits.

Lecture 3 hours; 3 credits. Explores various models of supervision and relates them to the administration and supervision of reading programs. Also prepares the prospective administrator/supervisor to make decisions relative to the methods and materials used to teach reading.

TLCI 727. Advanced Practicum in Reading. 3 Credits.

3 credits. This course is designed for teachers having completed the initial reading practicum. Its focus is on the refinement and further exploration of ways to work with students experiencing reading difficulties. Both group and individual tutoring experiences will be provided. Ways will be explored to encourage involvement in existing educational programs and schools.

TLCI 728. Contemporary Issues in Literacy Research. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: M.S.Ed. in Reading Education. Directed study of current topics of interest to students involved in literacy research. Topics to include emergent literacy assessment, adult literacy programs, and other areas of investigation. Students will be required to prepare a scholarly paper reporting results for publication.

TLCI 731. Instructional Technology Trends in Curriculum and Instruction. 3 Credits.

Lecture 3 hours; 3 credits. Examines selected issues and trends involving the use of technology in curriculum and instruction. Students develop a critical awareness of contemporary technology, an understanding of current research regarding the successful implementation of technology in curriculum and instruction, and strategies for using new technology in the future.

TLCI 732. Visual Communication and Design for Instructional Environments. 3 Credits.

Lecture 3 hours; 3 credits. Course focuses on visual literacy and the language of graphics. Students will learn to design visual messages, including text, graphics, and data displays. The theoretical underpinnings of various communications media and their efficacy in instructional environments will be studied and applied through graphics, textual, and multimedia software and components.

TLCI 735. Connecting Research In Early Developmental Practice in Early Childhood Education. 3 Credits.

Lecture. 3 credits. This seminar will explore philosophical orientations toward early childhood education, current research in the field, and the implication of this research for policy and practice. Students will focus on research within a community of practice orientation by linking current research and policy to current practices and issues in the field.

TLCI 736. Working with At-Risk Children and Families: An Ecological Approach. 3 Credits.

Lecture 3 hours; 3 credits. The influence of the home, the community and classroom on the achievement of at-risk children is examined. Successful teaching strategies and behavioral interventions also are discussed as well as the need to search for viable alternatives to strategies of past school reforms.

TLCI 737. Schools and Families: Enriching the Partnership. 3 Credits.

Lecture 3 hours; 3 credits. A critical examination and analysis of current trends in education as they affect the family and school will be addressed. Emphasis will be placed on the need for parent involvement and support in the child's education.

TLCI 739. Cross Cultural Perspectives in Early Childhood Education. 3 Credits.

Lecture 3 hours; 3 credits. This course will address the socialization process as a component of the broad perspective of a child's life. Curriculum development and how it is affected by the cultural context of an educational system will be discussed, as well as the impact of current trends on research and pedagogy in early childhood education.

TLCI 740. Issues in Early Childhood Language and Literacy. 3 Credits.

Lecture, 3 hours; 3 credits. This course follows a theory into practice philosophy, examining language acquisition and early literacy, teaching practice and learning. Students examine, develop and use advanced instructional strategies, materials, technologies, and activities to promote language and literacy development. The impact of formative assessment on instruction and curricular decision-making as well as cultural, social, familial, and multilingual issues will be addressed.

TLCI 741. Change Issues in Curriculum and Instruction. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: graduate standing. Explores questions and issues related to the evolving nature of curriculum and instruction and the design of the contemporary curriculum. Through readings and projects, students will examine new discoveries in research and technology, the effect of these and other changes on education, and the challenges of life-long learning as an influence on change.

TLCI 752. Curriculum Problems in Urban Schools and Society. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: graduate standing. Studies major curriculum problems and issues in urban education today and discusses how the changing urban environment affects curriculum planning and decision making.

TLCI 772. Advanced Developmental Process. 3 Credits.

Lecture 3 hours; 3 credits. This course is designed to examine the theoretical basis for alternative views of the nature of human development. Students' understanding of topical areas in child development will be enhanced through an examination of current research in child development and relevant findings from cross-cultural study.

TLCI 774. Constructivist Teaching. 3 Credits.

Lecture 3 hours; 3 credits. This course addresses Piaget's theory of cognitive and moral developments. Students will learn techniques for studying the behavior and development of young children. Analysis of constructivist research, replicated empirical work, and implications for planning learning environments and education programs for young children will be emphasized.

TLCI 788. Seminar in the Multicultural Environment. 3 Credits.

Lecture 3 hours; 3 credits. Explores topics related to the cultural characteristics of ethnically diverse populations and how these diverse populations and characteristics interact with social, political and economic institutions and the dominant culture to create the contemporary environment.

TLCI 795. Topics in Education. 1-3 Credits.

Lecture 1-3 hours; 1-3 credits. Provides opportunities for doctoral students to explore topics related to curriculum, instructional strategies, and evaluation.

TLCI 797. Independent Study. 1-3 Credits.

Hours to be arranged; 1-3 credits. Provides opportunities for the doctoral student to do independent research in an area of his/her particular interests and needs.

TLCI 802. Historical and Contemporary Perspectives on Education. 3 Credits.

Lecture, 3 hours; 3 credits. The present educational system, its social impact and future implications are viewed in historical, philosophical, and sociological perspectives. Special attention is given to technology, research, multicultural education/equity and leadership.

TLCI 803. Perspectives and Inquiry in Curriculum and Instruction. 3 Credits.

Lecture, 3 hours; 3 credits. This course introduces a range of methodologies, theoretical perspectives, and epistemologies in the field of curriculum and instruction. Students will gain strategies for critical reading, scholarly writing, and identify areas for prospective inquiry.

TLCI 804. Instruction Theories and Models. 3 Credits.

Lecture 3 hours; 3 credits. Students will investigate a range of instructional theories and design theories in terms of learning domains and pedagogical approaches to the teaching/learning process in a variety of educational settings. Students will utilize a systematic design process grounded in theories and research to propose/develop instruction for specific learning goals related to their own professional situations.

TLCI 805. Critical Issues: Curriculum Research. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: graduate standing. Explores the relationship between the historical, philosophical, and sociopolitical influence on curriculum development and evaluation. Historical and cultural approaches to designing and implementing curricular models, curriculum reform, and understanding the politics of conceptualizing the curriculum process are highlighted. Major issues concerning educational curriculum reform are addressed and reviewed.

TLCI 810. Models of Parent, Child, Social Interaction. 3 Credits.

Lecture, 3 hours. 3 credits. This course will examine the family with an emphasis on parent/child interactions. In addition, a model for ecological intervention will be discussed.

TLCI 821. Advanced Curriculum Design and Development. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: graduate standing. Focuses on the process of building a curriculum, historical developments in curriculum design, alternative curricula, current and future trends in curricular innovations, and research in curriculum development.

TLCI 822. Curriculum Seminar in Content Areas. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: graduate standing. Investigates the role and nature of the curriculum for particular subject-matter specialties — e.g., math, social studies, science, English, school librarianship, reading, etc. Objectives are tailored to specific content areas.

TLCI 824. Readings in Contemporary Society. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: graduate standing. Surveys the literature related to the issues and trends in contemporary society and provides educators with a substantive base in the philosophy, history, theory, strategies and multicultural perspectives relevant to curriculum development.

TLCI 826. Advanced Supervision of Reading Programs. 3 Credits.

Lecture 3 hours; 3 credits. Explores various models of supervision and relates them to the administration and supervision of reading programs. Also prepares the prospective administrator/supervisor to make decisions relative to the methods and materials used to teach reading.

TLCI 827. Advanced Practicum in Reading. 3 Credits.

3 credits. This course is designed for teachers having completed the initial reading practicum. Its focus is on the refinement and further exploration of ways to work with students experiencing reading difficulties. Both group and individual tutoring experiences will be provided. Ways will be explored to encourage involvement in existing educational programs and schools.

TLCI 828. Contemporary Issues in Literacy Research. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: M.S.Ed. in Reading Education. Directed study of current topics of interest to students involved in literacy research. Topics to include emergent literacy assessment, adult literacy programs, and other areas of investigation. Students will be required to prepare a scholarly paper reporting results for publication.

TLCI 831. Instructional Technology Trends in Curriculum and Instruction. 3 Credits.

Lecture 3 hours; 3 credits. Examines selected issues and trends involving the use of technology in curriculum and instruction. Students develop a critical awareness of contemporary technology, an understanding of current research regarding the successful implementation of technology in curriculum and instruction, and strategies for using new technology in the future.

TLCI 832. Visual Communication and Design for Instructional Environments. 3 Credits.

Lecture 3 hours; 3 credits. Course focuses on visual literacy and the language of graphics. Students will learn to design visual messages, including text, graphics, and data displays. The theoretical underpinnings of various communications media and their efficacy in instructional environments will be studied and applied through graphics, textual, and multimedia software and components.

TLCI 835. Connecting Research In Early Developmental Practice in Early Childhood Education. 3 Credits.

Lecture. 3 credits. This seminar will explore philosophical orientations toward early childhood education, current research in the field, and the implication of this research for policy and practice. Students will focus on research within a community of practice orientation by linking current research and policy to current practices and issues in the field.

TLCI 836. Working with At-Risk Children and Families: An Ecological Approach. 3 Credits.

Lecture 3 hours; 3 credits. The influence of the home, the community and classroom on the achievement of at-risk children is examined. Successful teaching strategies and behavioral interventions also are discussed as well as the need to search for viable alternatives to strategies of past school reforms.

TLCI 837. Schools and Families: Enriching the Partnership. 3 Credits.

Lecture 3 hours; 3 credits. A critical examination and analysis of current trends in education as they affect the family and school will be addressed. Emphasis will be placed on the need for parent involvement and support in the child's education.

TLCI 839. Cross Cultural Perspectives in Early Childhood Education. 3 Credits.

Lecture 3 hours; 3 credits. This course will address the socialization process as a component of the broad perspective of a child's life. Curriculum development and how it is affected by the cultural context of an educational system will be discussed, as well as the impact of current trends on research and pedagogy in early childhood education.

TLCI 840. Issue in Early Language and Literacy. 3 Credits.

Lecture, 3 hours; 3 credits. This course follows a theory into practice philosophy, examining language acquisition and early literacy, teaching practice and learning. Students examine, develop and use advanced instructional strategies, materials, technologies, and activities to promote language and literacy development. The impact of formative assessment on instruction and curricular decision-making as well as cultural, social, familial, and multilingual issues will be addressed.

TLCI 841. Change Issues in Curriculum and Instruction. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: graduate standing. Explores questions and issues related to the evolving nature of curriculum and instruction and the design of the contemporary curriculum. Through readings and projects, students will examine new discoveries in research and technology, the effect of these and other changes on education, and the challenges of life-long learning as an influence on change.

TLCI 845. Concepts and Contexts in School Librarianship. 3 Credits.

Will introduce candidates to the broad landscape of school librarianship and its relationship to the greater library and information profession. Includes a critical examination of benchmarks and key concepts tied to literacies, information science, and technical innovation.

TLCI 846. Frameworks for Best Practice in School Libraries. 3 Credits.

This course will explore best practice in school libraries using the framework of current national standards for school librarianship preparation programs. Major areas for exploration include but are not limited to teaching for learning, literacy and reading, information and access, advocacy and leadership, and program management and administration. Emphasis will be placed on extensive reading in each area. In preparation for a future article submission, students will conduct a thorough literature review in a specific area of interest.

TLCI 847. Strategic Leadership for School Libraries. 3 Credits.

This course will focus on the social, economic, and political issues and trends facing school libraries. The broad area of the social realities will include the increasing diversities in society, overcoming the digital divide, and preparing all students to be active and engaged 21st century citizens. Schools are facing harsh economic realities in funding as well as positive signs that resources in different formats may become less expensive and may greatly increase access. Common Core as well as other state and federal standards initiatives create opportunities on the political front as well.

TLCI 852. Curriculum Problems in Urban Schools and Society. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: graduate standing. Studies major curriculum problems and issues in urban education today and discusses how the changing urban environment affects curriculum planning and decision making.

TLCI 872. Advanced Developmental Process. 3 Credits.

Lecture 3 hours; 3 credits. This course is designed to examine the theoretical basis for alternative views of the nature of human development. Students' understanding of topical areas in child development will be enhanced through an examination of current research in child development and relevant findings from cross-cultural study.

TLCI 874. Constructivist Teaching. 3 Credits.

Lecture 3 hours; 3 credits. This course addresses Piaget's theory of cognitive and moral developments. Students will learn techniques for studying the behavior and development of young children. Analysis of constructivist research, replicated empirical work, and implications for planning learning environments and education programs for young children will be emphasized.

TLCI 877. Program Evaluation in Education. 3 Credits.

Lecture 3 hours; 3 credits. Examines procedures and problems in the design and utilization of program evaluation in education. Identifies evaluation purposes and the methods of evaluation especially as affected by organizational behavior, ethical considerations, and political influences. Evaluation methodology includes but is not limited to design considerations, data utilization, and teacher evaluation. Both quantitative and qualitative strategies will be covered.

TLCI 888. Seminar in the Multicultural Environment. 3 Credits.

Lecture 3 hours; 3 credits. Explores topics related to the cultural characteristics of ethnically diverse populations and how these diverse populations and characteristics interact with social, political and economic institutions and the dominant culture to create the contemporary environment.

TLCI 891. Dissertation Seminar. 3 Credits.

Lecture 3 hours; 3 credits. This seminar helps ECI doctoral students develop their skills and knowledge about the research process and assists them in developing a dissertation proposal. Students engage in debate and critique their oral and written dissertation proposals. Successful completion of the class does not guarantee a successful dissertation proposal. Dissertation proposals are approved by the student's dissertation committee.

TLCI 895. Topics in Education. 1-3 Credits.

Lecture 1-3 hours; 1-3 credits. Provides opportunities for doctoral students to explore topics related to curriculum, instructional strategies, and evaluation.

TLCI 897. Independent Study. 1-3 Credits.

Hours to be arranged; 1-3 credits. Provides opportunities for the doctoral student to do independent research in an area of his/her particular interests and needs.

TLCI 899. Dissertation. 1-12 Credits.

1-12 credits. Prerequisites: graduate standing, successful completion of candidacy exam and permission of the instructor.

TLCI 999. Teaching and Learning Curriculum and Instruction 999. 1 Credit.

TLED - Teaching & Learning- Education

TEACHING AND LEARNING-EDUCATION Courses

TLED 506. Teaching in the Multicultural Classroom. 3 Credits.

Lecture 3 hours; 3 credits. Explores the teaching strategies, materials and understandings needed in developing responsive classroom environments for children from diverse cultural, ethnic, economic and linguistic backgrounds.

TLED 530. PK-12 Instructional Technology. 3 Credits.

In this class, contemporary productivity tools and Internet resources are used to develop and evaluate instructional plans and techniques. The course is designed with three components. The first is on understanding models for effectively integrating technology into the curriculum. Next, the focus is on evidence-based good teaching practices that span across grades and subject levels, and the technologies and ways of using those technologies that support those practices. Finally, the focus is on technological tools that support the teacher in their everyday duties. Upon completion of this course, students should be able to pass, or apply for exemption from their school district's TSIP exam.

TLED 532. Developing Instructional Strategies PreK-6: Language Arts. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisites: TLED 530 and 568. Following a theory into practice philosophy, students explore, develop, and use instructional strategies, materials, technologies, and activities to promote children's development of attitudes, behaviors, and concepts in language arts in grades PreK-6 in support of NCTE national instructional standards and the Virginia Standards of Learning.

TLED 535. Developing Instructional Strategies PreK-6: Social Studies. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisites: TLED 530. Following a theory into practice philosophy, students explore, develop, and use instructional strategies, materials, technologies, and activities to promote children's development of attitudes, behaviors, and concepts in social studies in grades PreK-6 in support of NCSS national instructional standards and the Virginia Standards of Learning.

TLED 551. Developing Instructional Strategies for Teaching in the Middle/High School: English. 3 Credits.

Following a theory/research-into-practice philosophy, students explore, develop, and use instructional strategies, materials, technologies, and activities to promote the development of attitudes, behaviors, and concepts in English, grades 6-12, informed by national instructional standards and the Virginia Standards of Learning; 35 hours of teaching practicum required. Prerequisites: TLED 530, or TLED 677, passing scores on PRAXIS I or equivalent SAT scores as established by VA Board of Education, a criminal background check, acceptance into teacher education, no grade less than C- in content area and professional education core, minimum major and overall GPA of at least 2.75. (Additional prerequisites for MCTP students are ECI 608 and 616.).

TLED 555. Developing Instructional Strategies for Teaching in the Middle/High School: Social Studies. 3 Credits.

Following a theory/research-into-practice philosophy, students explore, develop, and use instructional strategies, materials, technologies, and activities to promote the development of attitudes, behaviors, and concepts in social studies, grades 6-12, informed by national instructional standards and the Virginia Standards of Learning; 35 hours of teaching practicum required. Prerequisites: TLED 530, or TLED 677, passing scores on PRAXIS I or equivalent SAT scores as established by VA Board of Education, a criminal background check, acceptance into teacher education, no grade less than C- in content area and professional education core, minimum major and overall GPA of at least 2.75. (Additional prerequisites for MCTP students are ECI 608 and 616.).

TLED 568. Language Acquisition and Reading for Students with Diverse Learning Needs. 3 Credits.

Lecture 3 hours; 3 credits. This course provides an overview of normal language development and language disorders which impact the acquisition of language based curriculum skills such as listening, speaking, reading, and written expression. Emphasis is on instructional techniques to assist students with diverse learning needs to achieve reading and comprehension skills. Effective reading strategies and curricula for individuals with disabilities will also be reviewed.

TLED 574. Foundations and Contemporary Issues in Early Childhood Education. 3 Credits.

Lecture 3 hours; 3 credits. This course introduces students to objectives, curricula, and organization of early childhood education as it is practiced throughout the United States and other countries. Foundations of education programs and current research and practices related to the education of young children will be addressed with an emphasis on sociological, cultural, historical, and philosophical factors.

TLED 578. Integrating Instruction Across the Curriculum PreK-6. 3 Credits.

Following a theory into practice philosophy and building on the instructional strategies for specific disciplines, students explore, develop, and use advanced instructional materials, technologies, and activities to promote interdisciplinary and multidisciplinary instruction across the curriculum in grades PreK-6 in support of national standards and the Virginia Standards of Learning. The field experience component (40 hours) includes participation in preK-3 and 4th-6th grade classrooms in an accredited public or non-public school, per program requirement. Prerequisites: TLED 301 or TLED 290, passing scores on PRAXIS I or met equivalent scores as established by VA Board of Education, a criminal background check, acceptance into teacher education, no grade less than C in content area and professional education core, minimum major overall GPA of at least 2.8 and at least two of the following: TLED 532, TLED 535, STEM 533, and STEM 534.

TLED 579. Classroom Management and Practice PreK-3; PreK-6. 3 Credits.

Course prepares prospective PreK-3 and PreK-6 teachers to provide instruction and management addressing the intellectual, physical, emotional and social needs of PreK-6 learners founded in empirically based practice. The field based component (70 hours) includes participation in PreK-3 and 4th-6th grade classrooms in an accredited public or non-public school. Students in the PreK-3 program are required to complete 35 hours in the Child Development Center. Attendance at seminars and debriefing sessions is required. Prerequisites: TLED 301 or 290, passing scores on PRAXIS I or met equivalent scores as established by VA Board of Education, a criminal background check, acceptance into teacher education, no grade less than C in content area and professional education core, minimum major and overall GPA of at least 2.8 and at least two of the following courses: TLED 432/532, 435/535, 478/578; STEM 433/533, 434/534.

TLED 583. Seminar in Teacher Education. 1 Credit.

Lecture 1 hour; 1 credit. Corequisite: students enrolling in TLED 551, STEM 553, STEM 554 and TLED 555 must also enroll in TLED 583. Prerequisite: admitted to approved teacher education program. This course explores issues, problems, concerns, and processes related to teaching and entering the profession of teaching. Passing score on PRAXIS II in licensure content area, passing scores on the Virginia Communication and Literacy Assessment (VCLA), and where appropriate passing scores on the Virginia Reading Assessment (VRA) are required to pass this course.

TLED 586. Student Teaching for Special Endorsement. 3-6 Credits.

Internship in school. Available for pass/fail grading only. Prerequisites: Collegiate Professional Certificate and/or completion of an approved program in teacher education, passing scores on PRAXIS I or equivalent SAT or ACT scores as established by VA Board of Education, passing scores on the appropriate PRAXIS II content examination, passing score on the Virginia Communication and Literacy Assessment, departmental approval, permission of the director of teacher education services, meet grade requirement in the specific content area and professional education core, minimum major and overall GPA of at least 2.75, and a criminal background check. (qualifies as a CAP experience).

TLED 592. Integrating Mathematics and Science Across the Curriculum, PK-3. 3 Credits.

Lecture 3 hours; 3 credits. This course has a theory-into-practice goal. The focus for this class will be to develop and use teaching strategies and techniques in the content area of mathematics and science, which are based on Piaget's theory of constructivism and are compatible with the NCIM & NSE Standards and the Virginia SOLs. Practical ways of encouraging thinking about math and science by young children, PK-3, and the natural integration of these subjects across the early childhood curriculum will be emphasized.

TLED 593. Integrating Children's Literature, Language Arts and Social Studies Across the ECE Curriculum. 3 Credits.

Lecture 3 hours; 3 credits. This course offers a review of literary materials suitable for nursery, kindergarten and early elementary school children. Social issues affecting children and early childhood literature related to these issues, the use of teaching strategies and techniques in the content areas of history, geography, economics and civics which are based on Piaget's theory of constructivism, the National Council of Teachers of English and the National Council for the Social Studies standards, and the Virginia SOLs are emphasized.

TLED 595. Topics in Education. 1-4 Credits.

Lecture 1-4 hours; 1-4 credits. Prerequisite: graduate standing. Explores contemporary problems and trends in education. Emphasis is placed upon topics related to curriculum, instructional strategies, and evaluation.

TLED 596. Topics in Education. 1-3 Credits.

Lecture 1-3 hours; 1-3 credits. Prerequisite: graduate standing. Cannot be applied to a Master of Science in Education degree in the Department of Educational Curriculum and Instruction. Explores contemporary problems and trends in education. Emphasis is placed upon topics related to curriculum, instructional strategies, and evaluation.

TLED 597. Topics in Education. 1-3 Credits.

Hours to be arranged: 1-3 credits. Prerequisite: graduate standing. Allows the student to engage in independent study of issues and trends in education. Emphasis is placed upon topics related to curriculum, instructional strategies, and evaluation.

TLED 598. Topics in Education. 1-3 Credits.

Hours to be arranged: 1-3 credits. Prerequisite: graduate standing. Allows the student to engage in independent study of issues and trends in education. Emphasis is placed upon topics related to curriculum, instructional strategies, and evaluation.

TLED 608. Foundations of Education and Instructional Assessment. 3 Credits.

Prerequisites: graduate standing. Provides students with an understanding of historical, philosophical, economic, and sociological issues in American education, their effect on student achievement, and the impact of social change on existing institutions. Includes the development of instruction based on assessment data including the use, construction, interpretation, and analysis of valid assessments. A 30-hour observation/participation experience is required in an appropriate prek-6, 6-8, or 6-12 grade level.

TLED 615. Teaching in the Middle School. 4 Credits.

Lecture 4 hours; 4 credits. Prerequisite: Graduate standing. Focusing on middle school teaching, this course examines the organization, curriculum, instructional strategies, classroom management techniques, and teaching methods for working with young adolescents. Also covered are middle school guidance, exploratories, scheduling, and parent-school relations. A 30-hour practicum in a middle school is required.

TLED 616. Design for Effective Instruction. 3 Credits.

Lecture 3 hours; 3 credits. Assists students in the organization of research on effective teaching for application in diversified classroom settings. Decision-making in the areas of content, learner behavior, and teacher behavior is stressed. Students learn the fundamentals of lesson design and basic instruction through a unit plan project and teaching vignettes.

TLED 619. Classroom Research and Assessment in Curriculum and Instruction. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: Graduate standing. Students admitted to elementary/middle school education prior to July 1, 2000, must take this course with TLED 669. Students will learn research techniques such as designs and data collection by conducting their own research studies with pupils in grades K-12. Measurement and evaluation principles and procedures for assessing and promoting children's learning and development will be addressed as will the interpretation of standardized tests.

TLED 622. Transitioning from Master Teacher to Mentor Teacher. 1 Credit.

1 hour on-line module. 1 credit. Prerequisite: Licensed teacher, 3 years of experience, recommendation from school division. The course provides information in five areas through online modules identified by teaching staff and human resource officials to develop mentor teachers. These five areas are: professionalism, collaboration, classroom/behavior management, differentiation of instruction, and diversity.

TLED 630. Develop and Enhancing Literacy with Culturally and Linguistically Diverse Learner Across Content Areas. 3 Credits.

Lecture 3 hours, 3 credits. This course focuses on the development and implementation of strategies that will accommodate how language and cultural differences affect communication and learning; knowledge of the impact of language-based curriculum skills such as listening, speaking, reading, and writing; instructional techniques needed to assist individuals identified as culturally, linguistically, and academically diverse in achieving reading and comprehension skills; comprehension strategies; and an understanding of reading across the disciplines.

TLED 636. Problems in Education. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: TLED 635. Provides practice in the use of quantitative or qualitative techniques, including analytical processes, in solving problems in education. Pass/Fail grading only.

TLED 638. Dynamic Assessment of Teaching and Learning. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: graduate standing. In this first course in the Field Based Graduate Program, students conduct an extensive qualitative and/or quantitative assessment of the teaching/learning dynamic in K-12 school settings. The assessment will include school culture, student demographics, curriculum, instructional practices, technology, and other critical components of teaching and learning. Analysis of the assessment will result in a document that emphasizes a professional development plan.

TLED 639. Seminar in Education. 3 Credits.

Hours to be arranged. 3 credits. Prerequisite: 15 graduate hours in education, including all core courses. Explores in depth a variety of current topics, trends and concerns in K-12 education.

TLED 640. The Management of Learning and Instruction. 3 Credits.

Lecture 3 hours; 3 credits. Explores problems and develops individual projects in many aspects of education and describes learners—how they learn and how teachers can facilitate their learning.

TLED 648. Digital Media for Educators. 3 Credits.

Lecture 3 hours; 3 credits. Course surveys a variety of tools, techniques and technologies, as well as strategies and common practices in the design and development of digital learning products using contemporary software such as Acrobat, Flash, Graphic Converter along with standard productivity tools. Students will gain hands-on experience in the creation of digital media elements suitable for use in traditional and distributed learning environments. Includes design and technical considerations of graphics manipulation and design, sound and video elements, and animation.

TLED 652. Language Arts in the Elementary/Middle School. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: graduate standing. Examines the teaching of oral and written expression, reading, spelling, and handwriting and describes conditions necessary for children's optimum development in the language arts.

TLED 655. Social Studies in the Elementary/Middle School. 3 Credits.

Lecture 3 hours; 3 credits. Includes advanced preparation of instructional objectives, evaluation procedures, instructional resources, classroom activities, and lesson development, and describes current social studies curriculum projects as well as current trends in the teaching of social studies.

TLED 656. Developing Instructional Strategies for Elementary Education. 3 Credits.

Lecture 3 hours; 3 credits. For MCTP students only. This course will focus on the selection of appropriate skills and objectives students require in their learning. Emphasis will be on how to determine which concepts should be taught and on which method/methods best suit both the objectives and the student. Information from previous courses will be taken to the next level of difficulty (i.e. task analysis, sequencing of objectives, and unit planning).

TLED 657. Language Arts Methods for Middle and Secondary School. 3 Credits.

Lecture 3 hours; 3 credits. For MCTP students only. This course is designed to teach prospective educators the components of language arts. Particular emphasis will be placed on analyzing the standards of learning for both disciplines, and the planning, development, and implementation of interdisciplinary units of study for middle and secondary school students.

TLED 662. Social Studies Methods for Middle and Secondary School. 3 Credits.

Lecture 3 hours; 3 credits. For MCTP students only. Course will provide pre-service teachers the opportunity to learn and make application of teaching methodologies appropriate for the secondary and middle school classrooms. Embracing the purpose of the social studies, the course will emphasize the integrated study of the social sciences and humanities, drawing upon such disciplines as anthropology, archaeology, economics, geography, history, law, philosophy, political science, psychology, religion, and sociology, as well as appropriate content from the humanities, mathematics, and the natural sciences.

TLED 665. Digital Video Materials Development. 3 Credits.

Lecture 3 hours; 3 credits. Design, development, and production of digital video and the use of video as an instructional component. Students will utilize teaching and learning theory to determine the effective use of video, and how to create video segments to enhance the understanding of appropriate knowledge chunks. In addition, technical aspects of digital media delivery in contemporary transmission systems will be explored.

TLED 666. Internship/Student Teaching and Seminar. 9 Credits.

Five days per week for 14 weeks; 9 credits. Prerequisites: completion of an approved program in teacher education, 6-8, passing scores on PRAXIS I or equivalent SAT or ACT scores as established by VA State Board of Education, passing scores on the appropriate PRAXIS II content examination, departmental approval, permission of the director of teacher education services, no grade less than C- in content area and professional education core, minimum major and overall GPA of at least 2.75. Available for pass/fail grading only. Provides practice in teaching in grades 6-8 and in analyzing teaching approaches and behaviors. Examines instructional problems and concerns.

TLED 668. Internship/Student Teaching and Seminar. 9 Credits.

Five days per week for 14 weeks; 9 credits. Prerequisites: completion of an approved program in teacher education PreK-6, passing scores on PRAXIS I or equivalent SAT or ACT scores as established by VA State Board of Education, passing scores on the appropriate PRAXIS II content examination, departmental approval, permission of the director of teacher education services, no grade less than C- in content area and professional education core, minimum major and overall GPA of at least 2.75. Available for pass/fail grading only. Provides practice in teaching in grades PK-6 and in analyzing teaching approaches and behaviors. Examines instructional problems and concerns.

TLED 669. Internship/Student Teaching and Seminar. 3-9 Credits.

Five days per week for 6-14 weeks; 3-9 credits. Available for pass/fail grading only. Provides practice in teaching and in analyzing teaching approaches and behaviors. Examines instructional problems and concerns. Prerequisites: Completion of an approved program in teacher education, passing scores on the appropriate licensure assessments, departmental approval, permission of the director of teacher education services, no grade less than C- in content area and professional education core, minimum major and overall GPA of at least 2.75, GPA of 3.0 required for graduate programs.

TLED 670. Assessment and Evaluation. 3 Credits.

Lecture 3 hours; 3 credits. Students will design a three-chapter research proposal and study the appropriate statistical references. Evaluation methodologies leading to this research are explored (portfolio/rubrics). Instructional technology and its classroom applications are interwoven into research and evaluation.

TLED 677. Advanced Child Development Theory and Research. 3 Credits.

Lecture. 3 cr. This course focuses on developing an in-depth understanding of major theories of children's learning and development as well as all aspects of their physical, social, emotional, and intellectual development from birth through adolescence. The course requires that students learn the concepts and terminology associated with each theory and be able to use thee in analyzing, interpreting, promoting, and evaluating children's growth and learning in the classroom. Research related to the classroom application of these theories is examined and evaluated based on principles of research design and interpretation.

TLED 679. Advanced Classroom Management and Practicum in PreK-6. 3 Credits.

Lecture 3 hours; 3 credits. Prerequisite: ECI 536 for students in the PreK-6 curriculum. This course will examine advanced methods for educators to use in order to make their classroom teaching and management more efficient and effective. This will include supervised involvement of the student in a practicum setting where the student, instructor and classroom teacher work together closely to develop knowledge and gain expertise in teaching children in a positive and effective learning environment. A weekly seminar is required.

TLED 688. Practicum in Early Childhood. 1-6 Credits.

1-6 credits. Supervised involvement of the student in a practicum setting where the student and the instructor work together closely to develop curriculum and gain expertise in teaching specific topics of importance to early childhood educators. A weekly seminar is required.

TLED 690. The Child and the Family. 3 Credits.

Lecture 3 hours; 3 credits. This course will examine children in the context of the families in which they live. Family systems theory provides the basis for study, and students do an in-depth examination of their own families of origin. The stages of the family life cycle are taught; principles of healthy family functioning are emphasized to promote healthy growth for children.

TLED 695. Topics in Education. 1-3 Credits.

Lecture 1-3 hours; 1-3 credits. Prerequisite: Graduate standing. Provides opportunities for graduate students to explore current topics, trends and issues related to curriculum, instructional strategies, and evaluation.

TLED 697. Topics in Secondary School Instruction. 1-3 Credits.

Lecture 1-3 hours; 1-3 credits. Prerequisite: graduate standing. Provides offerings in several content areas to meet the needs of graduate students in secondary education.

TLED 698. Thesis. 3-6 Credits.

6 credits. Prerequisites: graduate standing and permission of the instructor. Master's-level research and thesis in topics related to curriculum, instructional strategies, and evaluation in educational settings.

TLED 699. Thesis. 3-6 Credits.

6 credits. Prerequisites: graduate standing and permission of the instructor. Master's-level research and thesis in topics related to curriculum, instructional strategies, and evaluation in educational settings.

TLED 710. Models of Parent, Child, Social Interaction. 3 Credits.

Lecture 3 hours; 3 credits. This course will examine the family with an emphasis on parent/child interactions. In addition, a model for ecological intervention will be discussed.

TLED 810. Models of Parent, Child, Social Interaction. 3 Credits.

Lecture 3 hours; 3 credits. This course will examine the family with an emphasis on parent/child interactions. In addition, a model for ecological intervention will be discussed.

TLED 998. TLED 998. 1 Credit.**TLED 999. Educational Curriculum and Instruction. 1 Credit.**

1 credit. A one-hour pass/fail registration required of all graduate students to maintain active status during the final semester prior to graduation. After successfully passing the candidacy examination, all doctoral students are required to be registered for at least one graduate credit each term until the degree is complete.

WMST - Women's Studies

WOMEN'S STUDIES Courses

WMST 500. U.S. Women's Activism. 3 Credits.

This course historicizes U.S. women's social, political, and rhetorical activism over the last 200 years, tracing their entry into and shaping force upon public life. The course examines the development of women's activism in the nineteenth century, the twentieth-century women's (or feminist) movement, and its current status, particularly in relation to postfeminism and a "third" wave.

WMST 501. Women: A Global Perspective. 3 Credits.

An analysis of the global forces that impact women's lives throughout the world. Particular emphasis is placed on the status of women in the developing world, international institutions that protect women's rights, and efforts to promote gender equality worldwide. (This is a writing intensive course.)

WMST 514. Motherhood: Texts and Images. 3 Credits.

This course examines the role of the mother, the experience of mothering and the institution of motherhood through a number of disciplinary and theoretical lenses. It considers how motherhood functions to women's advantage or disadvantage in professional and economic areas as well as the mother's ideological construction in public discourse, imagery, non-fiction, and film.

WMST 560. Feminist Theory. 3 Credits.

A study of the renaissance in feminist theory since the 1960s through close readings of key documents and texts. The course covers a variety of feminist perspectives as expressed in both theory and practice. (This is a writing intensive course.)

WMST 570. Feminist Research Methods. 3 Credits.

This course explores the ethics, practice, and multiple forms of conducting feminist research. Narrative research methods are practiced through hands-on oral history assignments. Throughout the course, the process of knowledge construction is interrogated from a feminist perspective.

WMST 595. Topics in Women's Studies. 3 Credits.

Advanced seminars on selected topics. The subject matter is usually be interdisciplinary. These seminars are more fully described on the women's studies website and in material distributed each semester to academic advisors.

WMST 596. Topics in Women's Studies. 3 Credits.

Advanced seminars on selected topics. The subject matter is usually be interdisciplinary. These seminars are more fully described on the women's studies website and in material distributed each semester to academic advisors.

WMST 597. Independent Study. 1-6 Credits.

1-6 credits. Prerequisite: at least one women's studies course. Independent study of an interdisciplinary women's studies topic, or a reading plus internship project to be selected under the direction of a women's studies faculty member. Conferences and papers as appropriate. Tutorial work, either library-based or field work, must be approved by the instructor and the women's studies chair before a student may enroll in the course. No more than three credits of tutorial work may be counted within the basic requirements for the women's studies minor or major.

WMST 598. Independent Study. 1-6 Credits.

1-6 credits. Prerequisite: at least one women's studies course. Independent study of an interdisciplinary women's studies topic, or a reading plus internship project to be selected under the direction of a women's studies faculty member. Conferences and papers as appropriate. Tutorial work, either library-based or field work, must be approved by the instructor and the women's studies chair before a student may enroll in the course. No more than three credits of tutorial work may be counted within the basic requirements for the women's studies minor or major.

WMST 668. Internship. 3-6 Credits.

3-6 credits. Prerequisites: graduate standing and instructor approval required. Course provides an opportunity to gain experience working in organizations and government agencies. Students' work should engage with women's issues at the local, regional, national, and/or global levels. Students must work for at least 50 hours per course credit.

WMST 695. Selected Topics in Women's Studies. 3 Credits.

The advanced study of selected topics which permit small groups of qualified students to work on subjects of mutual interest under the direction of an instructor. Courses may not be offered regularly; when offered courses appear in the course schedule and are more fully described in information distributed to advisors.

WMST 696. Topics in Women's Studies. 1-3 Credits.**WMST 697. Independent Study. 3 Credits.**

3 credits each semester. Prerequisite: graduate standing. Independent study of an interdisciplinary women's studies topics to be selected under the direction of a women's studies faculty member. Conferences and papers as appropriate.

WMST 698. Independent Study. 3 Credits.**WMST 795. Selected Topics in Women's. 3 Credits.**

Prerequisites: Instructor approval. The advanced study of selected topics that permit small groups of qualified students to work on subjects of mutual interest under the direction of an instructor. Courses may not be offered regularly; when offered courses appear in the course schedule and are more fully described in information distributed to advisors.

WMST 797. Independent Study. 1-3 Credits.

1-3 credits. Prerequisite: graduate standing; doctoral level only for 897. Independent study of an interdisciplinary women's studies topic to be selected under the direction of a women's studies faculty member. Conferences and papers as appropriate.

WMST 897. Independent Study. 1-3 Credits.

1-3 credits. Prerequisite: graduate standing; doctoral level only for 897. Independent study of an interdisciplinary women's studies topic to be selected under the direction of a women's studies faculty member. Conferences and papers as appropriate.

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