Frank Batten College of Engineering and Technology

Oktay Baysal, Dean
Linda Vahala, Associate Dean
Shirshak Dhali, Associate Dean

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 in engineering technology. The course of study that leads to engineering degrees is characterized by a solid foundation in the theoretical underpinnings of engineering based in science and mathematics. Graduates are well equipped to pursue graduate education, pursue professional registration, or enter the engineering profession. The course of study that leads to engineering technology degrees is characterized by strong laboratory experiences that will prepare the graduate to hit the ground running as a technical partner of the engineer who can implement advanced design analysis and development concepts. The engineering technology degree is considered to be a terminal degree and graduates are prepared for manufacturing, testing, production and operations.

The Batten College of Engineering and Technology established the first academic department in Modeling, Simulation and Visualization Engineering in 2010. This department offers well established graduate degrees and the first Bachelor of Science degree in Modeling and Simulation Engineering.

The engineering and engineering technology programs at Old Dominion University are specifically designed to take advantage of the unique assets in the Hampton Roads area. These assets include:

1. a strong technology center to promote and use modeling and simulation
2. the NASA Langley Research Center with its focus on aerospace and virtual environments
3. the Jefferson Laboratories, a major center of nuclear physics
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,
6. a major high technology industry base
7. very large military presence and installations

These assets have enabled the development of distinctive engineering and technology curricula. Points of distinction (from other programs in and out of the state) include the following:

Career Advantage Program

Engineering and technology graduates get a head start on the engineering job market by preparing academically and experientially for their engineering and technology careers.

Career Management Center

Students receive direct assistance in locating full- and part-time employment including co-op and internship opportunities through the college’s Career Management office.

Engineering Up-Front

Freshmen immediately become engaged in practical engineering and technology activities through a required course, Explore Engineering/Technology. Team projects in different engineering disciplines allow students to experience the professional spectrum from idea generation through its translation into the design, manufacture and commercialization cycle. Students are encouraged to complete this course before declaring a specific engineering discipline as a major.

Multi-Disciplinary Industry Senior Project

Seniors may choose to join a multi-disciplinary team of students led by faculty and industry representatives to work on an industry project subject to specific deliverables and time and budget constraints.

Accelerated Bachelor’s/Master’s Degree Programs

Students in the Batten College of Engineering and Technology may be accepted into both a bachelor’s and master’s program at the freshman year through the junior year and receive both degrees in five years. The degrees need not be in the same field of engineering.

Professional Engineer (P.E.) Certification

The College encourages all of its graduates to eventually be certified as Professional Engineers (P.E.). The certification requires taking the Fundamentals of Engineering (FE) Examination and the Professional Engineering (PE) Examination. All students are encouraged to take the FE Examination in their senior year. For details, contact the Dean’s Office and the following web site: www.dpor.virginia.gov (http://www.dpor.virginia.gov)

For further information, please visit the college’s web site: www.odu.edu/eng

Programs of Study

Bachelor’s

Engineering Programs:
- Civil
- Computer
- Electrical
- Mechanical
- Modeling & Simulation

Engineering Technology:
- Civil (CET)
- Electrical (EET)
- Mechanical (MET)
- General (GET)

Master’s

Engineering Programs:
- Aerospace
- Civil
- Electrical & Computer
- Engineering Management
- Environmental
- Mechanical
- Modeling & Simulation
- Systems Engineering

Doctoral

Engineering Programs:
- Aerospace
- Biomedical
- Civil & Environmental
• Electrical and Computer
• Engineering Management
• Engineering Management & Systems Engineering
• Mechanical
• Modeling & Simulation

Enterprise Centers
The Batten College of Engineering and Technology is a catalyst for the economic development of Hampton Roads. To this end, the college has established a number of centers to serve as engines for enterprise development. These centers utilize all University resources, including students and faculty. The former engineering centers now elevated as University Centers are the Virginia Modeling, Analysis and Simulation Center (VMASC) and Bioelectrics. The Mid-Atlantic Regional Spaceport (MARS) has been transferred to the Commonwealth.

Applied Research Center (ARC)
Hani Elsayed-Ali, Director
ARC is an advanced materials engineering and laser technology research center. Staffed with industry/university teams utilizing the Jefferson Lab technologies, ARC provides commercial product-related research in the areas of thin film technology, laser and plasma processing of materials, materials analysis, and devices and sensor fabrication. For more information: www.eng.odu.edu/arc.

National Center for System of Systems Engineering (NCSOSE)
Charles Keating, Director
NCSOSE is a collection of independent, nonprofit, engineering research and application organizations, government entities, and universities that have joined together with a common goal to solve problems, develop technologies, and direct research focused on critical issues related to the integration of complex systems of systems.

Affiliated Centers
Frank Reidy Research Center for Bioelectrics
Richard Heller, Director
The mission of the Center is to increase scientific knowledge and understanding of the interaction of electromagnetic fields and ionized gases with biological cells and to apply this knowledge to the development of medical diagnostics, therapeutics, and environmental contamination. 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. For more information: www.odu.edu/engr/bioelectrics/.

Virginia Modeling, Analysis, and Simulation Center (VMASC)
John Sokolowski, Director
VMASC is a multi-disciplinary research center of Old Dominion University. Working with more than 100 industry, government, and academic members, VMASC furthers the development and applications of modeling simulation, and visualization as enterprise decision-making tools to promote economic, business, and academic development. For more information: www.vmasc.odu.edu.

Departmental Institutes
Coastal Engineering is part of the college’s Department of Civil and Environmental Engineering. Its mission is to foster interdisciplinary educational and research opportunities for faculty and students interested in applied coastal science and engineering. Director: David R. Basco.

Institute for Multidisciplinary Parallel and Vector Computations
promotes interactions (and/or collaborations) among researchers in the areas of engineering applications, large scale computations, and parallel software and algorithm developments. Director: Duc T. Nguyen.

Plasma Engineering and Medicine Institute
conducts fundamental and applied investigations using laser and plasma technologies. It offers state-of-the-art equipment and a vibrant academic environment where faculty, graduate students and undergraduate students collaborate in advanced fundamental and applied research in the field of cold plasmas, and its applications in engineering and medicine. Director: Mounir Laroussi.

Transportation Research Institute
 collaborates with centers and departments across the ODU campus to conduct innovation-based research in the core areas of transportation operations, transportation safety, transportation planning, freight transportation, and environment, energy, and sustainable transport. Director: Mecit Cetin.

Marine Engineering Institute, in collaboration with the shipbuilding and repair industry, promotes the research, development, education, and application of innovative techniques in the life cycle costs of marine assets including military, commercial, and pleasure craft. Director: To be named.

Sustainable Development Institute promotes and provides engineering, ecological, environmental, and economic assistance to local, regional, and national governmental agencies, as well as international organizations and businesses. The institute actively participates in community service by conducting waste minimization and pollution prevention assistance to local businesses. Director: Mujde Erten-Unal.

Virginia Institute for Photovoltaics conducts research that spans from the nanoscale to the deployment of Gigascale commercial power generation. A current focus is to research and develop the science and engineering of photovoltaic devices, or Solar cells, and take them from the laboratory to the industry. Director: Sylvain Marsillac.

Virginia Institute for Vision Analysis leverages the expertise of faculty in computer vision, signal/image processing and machine learning. Research focuses on novel theory, state-of-art algorithms, architectures, real-time implementations for biomedical engineering, human and machine-centric recognition, environmental and geoscience applications, and computer-aided medical diagnosis systems. Director: Khan Iftekharuddin.

Special Programs
Cooperative Education Program
The cooperative education programs in the Frank Batten College of Engineering and Technology at Old Dominion University are of the highest academic quality. These programs allow students to combine academic study with professional-level training. Cooperative education positions are based on the alternating program style in which periods of full-time study are alternated with periods of full-time employment. Full-time employment periods must accumulate to the equivalent of one calendar year. Participation in the cooperative education program can be a source of financial support to help meet a substantial portion of college expenses. All departments in the Frank Batten College of Engineering and Technology strongly endorse the concept of cooperative education.

Accelerated Bachelor’s/Master’s Degree Programs
These 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 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. Prerequisite 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.

Old Dominion University/Eastern Virginia Medical School Joint Program in Medicine

The joint program in medicine is designed to encourage highly qualified students to receive a B.S. from Old Dominion University and an M.D. from Eastern Virginia Medical School. Students apply after completion of their freshman year at Old Dominion University. Upon successful completion of requirements and graduation from Old Dominion University, a student accepted in the ODU/EVMS Joint Program in Medicine will be guaranteed admission to Eastern Virginia Medical School. Engineering and engineering technology students are encouraged to apply for this program. Complete information can be found in the College of Sciences section of this catalog.

Bachelor-to-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 would obtain a master’s degree and then pursue 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 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 faculty members and pursue a research experience. Just as in the five-year Bachelor/M.S. program, six credit hours of graduate course work may again be counted towards the undergraduate degree and doctoral course work mentioned above for the 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.

Undergraduate Programs

The Bachelor of Science in Civil Engineering, the Bachelor of Science in Computer Engineering, the Bachelor of Science in Electrical Engineering and the Bachelor of Science in Mechanical Engineering are accredited as engineering programs by:

Engineering Accreditation Commission (EAC) of ABET
415 N. Charles Street
Baltimore, MD 21202-4012
Telephone: (410) 347-7700.

The Bachelor of Science in Modeling and Simulation Engineering plans to apply for accreditation by the Engineering Accreditation Commission (EAC) of ABET when it becomes eligible following the graduation of the first senior class in 2013.

The Bachelor of Science in Engineering Technology has programs in civil engineering technology, electrical engineering technology, and mechanical engineering technology that are accredited as engineering technology programs by:

Engineering Technology Accreditation Commission (ETAC) of ABET
415 N. Charles Street
Baltimore, MD 21202-4012
Telephone: (410) 347-7700.

Engineering Fundamentals Division

Linda Vahala, Director

Bonita Anthony, Assistant Director

The Engineering Fundamentals Division (EFD) is designed to provide support to students as they make the transition into the Frank Batten College of Engineering and Technology. All students are admitted to this division until they are prepared to successfully take courses in their major. While in this division, students receive individualized counseling, mentoring, and advising support designed to prepare them for success in their chosen engineering or technology major. A key experience for students in this division is the year-long course in the Fundamentals of Engineering. This group-oriented course uses hands-on projects to expose students to the spectrum of engineering practices from innovation through design, manufacture and commercialization of a product or process. It also provides students with an opportunity to experience various aspects of engineering and have a basis for selecting their major.

Admission

Students who qualify for regular admission to the University will be accepted into EFD. Students in EFD may identify a desired degree program or may declare that they are undecided among engineering and engineering technology programs. They will be assigned an intended major code classification, which indicates that they are enrolled and, if appropriate, which is their preferred program.

Matriculation into a Degree Program

Students should apply to the desired program during the semester in which they complete the requirements in the Engineering Fundamentals Division. Students will be notified of the admission decision upon satisfying these requirements:

1. complete the course Explore Engineering and Technology
2. complete at least 30 credit hours applicable toward a degree
3. have an overall GPA of 2.00 or higher
4. meet any other additional degree program admission requirements.

Normally, students are not eligible to enroll in major courses until they are accepted into the degree program. Students may petition to waive this rule when extenuating circumstances warrant.

Continuance

Students are eligible to continue in the EFD as long as they:

1. meet the continuance regulations of the University and
2. make reasonable progress toward matriculation into an engineering or engineering technology program.

A student who has ceased reasonable progress toward matriculation into a college degree program will be notified in writing. One semester following this notification, if reasonable progress has not resumed, the student will be referred to the Center for Major Exploration. A student who successfully completes the requirements must apply to and be accepted by a college degree program. Students not accepted into a degree program during a period of one semester beyond completion of the requirements will be referred to the Center for Major Exploration.

Computer Requirement

The Frank Batten College of Engineering and Technology requires that all incoming freshmen to the college have a notebook or laptop computer that meets or exceeds the Mobile Monarch Student Notebook Program’s recommended models for engineering majors. Students are strongly
**Engineering Fundamentals—Engineering Programs**

The following courses are to be taken Freshman year.

**Freshman First Semester**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGN 110</td>
<td>Explore Engineering and Technology</td>
<td>2</td>
</tr>
<tr>
<td>MATH 211</td>
<td>Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 121N</td>
<td>Foundations of Chemistry I Lecture</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 122N</td>
<td>Foundations of Chemistry I Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>ENGL 110C</td>
<td>English Composition (grade of C or better required)</td>
<td>3</td>
</tr>
<tr>
<td>GEN ED - Way of Knowing</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Total Hours</strong></td>
<td><strong>16</strong></td>
</tr>
</tbody>
</table>

**Freshman Second Semester**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CEE 111</td>
<td>Information Literacy and Research *</td>
<td>2</td>
</tr>
<tr>
<td>or ECE 111</td>
<td>Information Literacy and Research for Electrical and Computer Engineering</td>
<td></td>
</tr>
<tr>
<td>or MAE 111</td>
<td>Mechanical and Aerospace Engineering Information Literacy and Research</td>
<td></td>
</tr>
<tr>
<td>or MSIM 111</td>
<td>Information Literacy and Research for Modeling and Simulation Engineers</td>
<td></td>
</tr>
<tr>
<td>or ENGT 111</td>
<td>Engineering Technology Information Literacy/ Research</td>
<td></td>
</tr>
<tr>
<td>MATH 212</td>
<td>Calculus II</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 123N</td>
<td>Foundations of Chemistry II Lecture</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 231N</td>
<td>University Physics</td>
<td>4</td>
</tr>
<tr>
<td>CS 150</td>
<td>Problem Solving and Programming I</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td><strong>Total Hours</strong></td>
<td><strong>17</strong></td>
</tr>
</tbody>
</table>

* Meets information literacy and research general education requirement in conjunction with courses in the major.

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**Engineering Fundamentals—Engineering Technology Programs**

Refer to the program curriculum listing appearing in the Engineering Technology section.

**Advanced Placement**

The University provides for possible advanced placement for up to 60 semester hours of course work. The student should refer to the advanced placement policy of specific departments (Mathematics and Statistics, Physics, Chemistry and Biochemistry, etc.) and the Policy for Experiential Learning Credit Options at the Undergraduate Level found in this Catalog.

Qualified students may take advanced placement examinations in certain courses in the various departments of the Batten College of Engineering and Technology. The student should contact the chair of the department offering the course for information on applicability and approval.

Prospective freshmen are encouraged to take as many advanced placement courses as possible in high school. Further, prospective freshmen are encouraged to take as many AP examinations of the Educational Testing Service and CLEP examinations as possible. Qualifying scores on these examinations may result in advanced placement credit. However, freshmen should still consult with their faculty advisor before “skipping” courses given at Old Dominion University.

**Transfer Students**

Transfer students seeking admission to an engineering or engineering technology program at Old Dominion University must complete the standard admission procedures as established by the Office of Admissions.