Electrical and Computer Engineering
Web Site: http://www.odu.edu/ece

Khan Iftekharuddin, Chair
Oscar Gonzalez, Associate Chair

The Department of Electrical and Computer Engineering offers undergraduate four-year degree programs leading to the Bachelor of Science in Electrical Engineering and the Bachelor of Science in Computer Engineering. These programs are accredited by the Engineering Accreditation Commission (EAC) of ABET, http://www.abet.org. The undergraduate programs provide a broad foundation in electrical and/or computer engineering through combined lecture and laboratory work and prepare the student for entering the profession of electrical and/or computer engineering. In addition, these programs prepare the students for further study at the graduate level.

The department also offers programs of graduate study leading to the degrees of Master of Engineering and Master of Science in electrical and computer engineering and Doctor of Philosophy in electrical and computer engineering. Faculty members in electrical and computer engineering are actively engaged in research, and the department maintains extensive laboratory facilities to support the research work. Areas of specialization include biomedical engineering, bioelectronics, plasmas, microelectronics/nanotechnology, photovoltaics, atomic layer deposition, laser processing, multivariable systems/nonlinear control, computational intelligence and machine vision, signal and image processing, modeling/simulation/visualization, medical modeling, computer networks, and communications.

Students majoring in either electrical engineering or computer engineering may fulfill the upper-level General Education requirements through completion of a minor in the other discipline. Computer engineering students automatically meet this requirement with the built-in minor in computer science.

Mission Statement
The Department of Electrical and Computer Engineering at Old Dominion University is a partnership among students, faculty and staff in Service to the profession of Electrical and Computer Engineering through academic excellence, Research and real-world experiences, dedicated to a Vision of the future that includes Industry and community, Continuous improvement, and personal Enrichment and growth (SERVICE).

Bachelor of Science in Electrical Engineering
Vishnu K. Lakdawala, Chief Departmental Advisor

The electrical engineering undergraduate curriculum begins with a solid foundation in math, science, English, circuits, signals and linear systems, electronics, electromagnetics, digital systems, and microelectronics. Adequate elective freedom is available to the senior student to allow specialization in emphasis areas such as system science, physical science, digital design, electrical power and power systems. Emphasis is placed on understanding principles through theoretical investigation and experimental verification. In addition, course work in General Education Skills and Ways of Knowing are required to assure a well-rounded program of study.

Electrical Engineering Program
Educational Objectives
The electrical engineering program seeks to prepare graduates who, after the first few years of their professional career, have:

1. established themselves as practicing engineering professionals in industry or government, or engaged in graduate study
2. demonstrated their ability to work successfully as members of a professional team and function effectively as responsible professionals
3. demonstrated their ability to adapt to new technology and career challenges

Student Outcomes
The electrical engineering student outcomes are as follows. Graduates must attain:

1. an ability to apply knowledge of mathematics, science, and engineering.
2. an ability to design and conduct experiments, as well as to analyze and interpret data.
3. an ability to design an electrical system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
4. an ability to function on multi-disciplinary teams.
5. an ability to identify, formulate, and solve electrical engineering problems.
6. an understanding of professional and ethical responsibilities.
7. an ability to communicate technical ideas effectively in writing and speaking.
8. the broad education necessary to understand the impact of electrical engineering solutions in a global, economic, environmental, and societal context.
9. a recognition of the need for, and an ability to engage in life-long learning.
10. a knowledge of contemporary issues.
11. an ability to use the techniques, skills, and modern engineering tools necessary for electrical engineering practice.

Electrical Engineering Curriculum*

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<tr>
<th>Freshman</th>
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<td>MATH 312 (285)</td>
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Old Dominion University 1
Electrical and Computer Engineering

ECE 332  3  ECE 387 (or Technical Elective)  3
Human Creativity Way of Knowing  3  Literature Way of Knowing  3

16  15

Senior

First Term | Hours | Second Term | Hours
---|---|---|---
ECE 485W (grade of C or better required) | 3 | ECE 487 | 2
ECE 486 | 2 | ECE Technical Elective | 3
ECE Technical Elective | 3 | ECE Technical Elective | 3
ECE Technical Elective | 3 | Human Behavior Way of Knowing | 3
ENMA 480** | 3 | Upper-Division General Education course | 3

Upper-Division General Education course | 3

Total credit hours: 127

* Does not include the University’s General Education language and culture requirement. Additional hours may be required.

** Meets philosophy and ethics general education requirement.

The General Education requirements in information literacy and research, impact of technology, and philosophy and ethics are met through the major.

Electrical engineering majors must earn a grade of C or better in all 200-level ECE courses prior to taking the next course in the sequence.

Bachelor of Science in Computer Engineering

Vishnu K. Lakdawala, Chief Departmental Advisor

The computer engineering undergraduate degree program is designed to provide both a broad engineering background and a comprehensive foundation in the technical principles underlying the computer area. Students develop a background through coursework in mathematics, the basic sciences, and general engineering. The technical core consists of coursework from electrical engineering to address hardware aspects of computer engineering and coursework from computer science to address software aspects. Adequate elective freedom is available to senior students to allow specialization in emphasis areas such as modeling and simulation, computer hardware, and computer networks. In addition, coursework in General Education Skills and Ways of Knowing is required to assure a well-rounded program of study.

Computer Engineering Program Educational Objectives

The computer engineering program seeks to prepare graduates who, after the first few years of their professional career, have:

1. established themselves as practicing engineering professionals in industry or government, or engaged in graduate study
2. demonstrated their ability to work successfully as members of a professional team and function effectively as responsible professionals
3. demonstrated their ability to adapt to new technology and career challenges.

Student Outcomes

The computer engineering student outcomes are as follows. Graduates must attain:

1. an ability to apply knowledge of mathematics, science, and engineering.
2. an ability to design and conduct experiments, as well as to analyze and interpret data.
3. an ability to design a digital hardware and/or software system to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
4. an ability to function on multi-disciplinary teams.
5. an ability to identify, formulate, and solve computer engineering problems.
6. an understanding of professional and ethical responsibilities.
7. an ability to communicate technical ideas effectively in writing and speaking.
8. the broad education necessary to understand the impact of computer engineering solutions in a global, economic, environmental, and societal context.
9. a recognition of the need for and an ability to engage in life-long learning.
10. a knowledge of contemporary issues.
11. an ability to use the techniques, skills, and modern engineering tools necessary for computer engineering practice.

Computer Engineering Curriculum*

Freshman

First Term | Hours | Second Term | Hours
---|---|---|---
ENGN 110 | 2 | ECE 111 | 2
CHEM 121N | 3 | CHEM 123N | 3
CHEM 122N | 1 | MATH 212 | 4
MATH 211 | 4 | CS 250 | 4
PHYS 231N | 4 | CS 150 | 4
ENGL 110C (grade of C or better required) | 3 | PHYS 231N | 4
COMM 101R | 3

Sophomore

First Term | Hours | Second Term | Hours
---|---|---|---
MATH 307 (280) | 3 | ECE 202 | 3
ECE 201 | 3 | ECE 287 | 2
ECE 241 | 4 | CS 250 | 4
PHYS 232N | 4 | CS 252 | 1
Literature Way of Knowing | 3 | ENGL 231C (grade of C or better required) | 3

Junior

First Term | Hours | Second Term | Hours
---|---|---|---
ECE 302 | 3 | ECE 304 | 3
ECE 313 | 4 | ECE 346 | 3
ECE 341 3  ECE 381 3
CS 361 3  CS 350 3
Human Creativity 3  ECE Technical Elective 3
Way of Knowing

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<tr>
<th>Senior</th>
<th>First Term</th>
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<tr>
<td>ECE 484W (grade of C or better required)</td>
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|       | 17 | 14 |

Total credit hours: 128

* Does not include the University’s General Education language and culture requirement. Additional hours may be required.

** Meets philosophy and ethics general education requirement.

The General Education requirements in information literacy and research, impact of technology, and philosophy and ethics are met through the major. The upper-division General Education requirement is met through a built-in minor in computer science.

Computer engineering majors must earn a grade of C or better in all 200-level ECE courses prior to taking the next course in the sequence.

**Continuance Regulations**

It is the policy of the Department of Electrical and Computer Engineering to deny a student eligibility to enroll in ECE courses after it becomes evident that he or she is either unable or unwilling to maintain reasonable standards of academic achievement. At the end of each semester, including summer sessions, the department reviews the records of all students.

1. A student will be placed on departmental academic probation whenever his or her major grade point average falls below 2.00 (after six or more hours have been attempted in the major.)

2. A student is subject to termination from the departmental engineering program if his or her record shows one of the following:
   a. A deficiency of more than nine grade points below that required to maintain a 2.00 cumulative average in the major. This rule applies to students who have attempted fewer than 35 hours of their departmental engineering courses, including transfer hours.
   b. A deficiency of more than six grade points below that required to maintain a 2.00 cumulative average in the major. This rule applies to students who have attempted 35 hours or more of their departmental engineering courses, including transfer hours.

Appeals of termination from the engineering program are in order if extenuating circumstances warrant. Appeals are to be made in writing to the chair of the department. Once the appeal is submitted, it is considered by the faculty of the department.