ELECTRICAL AND COMPUTER ENGINEERING

http://ece.illinois.edu

Head of the Department: William H. Sanders
Director of Graduate Studies: Nitin H. Vaidya
Graduate Programs
2120 Electrical and Computer Engineering Building
306 N. Wright St.
Urbana, IL 61801
(217) 300-2414
Email: ece-grad-apps@illinois.edu

Major: Electrical and Computer Engineering

Degrees Offered: M.Eng., M.S., Ph.D.

Medical Scholars Joint Degree Program: Doctor of Philosophy (Ph.D.) in Electrical and Computer Engineering and Doctor of Medicine (M.D.) through the Medical Scholars Program (https://www.med.illinois.edu/mdphd)

Graduate Degree Programs

The department offers graduate study and research in electrical and computer engineering leading to the degrees of Master of Engineering, Master of Science, and Doctor of Philosophy. Virtually every specialty within electrical and computer engineering is represented. Courses and research opportunities exist in the following areas:

- applied computation theory
- bioengineering, acoustics, and magnetic resonance engineering
- communications
- computer-aided design and test
- computer systems
- computer vision and robotics
- decision and control
- electromagnetic fields
- electrooptics, lasers, and plasmas
- integrated circuits
- microelectro-mechanical systems
- mobile computing and communication
- optoelectronics
- power and energy systems
- power electronics
- remote sensing and propagation
- semiconductor materials and devices
- semiconductor physics and computational electronics
- signal, image, and speech processing

The Master of Engineering degree in ECE is designed for students having a B.S. degree in ECE or a related field and offers an opportunity to broaden knowledge of areas in ECE beyond what is possible in a four-year undergraduate curriculum. The M.Eng. is a professional degree and is not intended for students interested in obtaining research experience. Students interested in a research-oriented career and all students interested in obtaining a Ph.D. should instead apply to the traditional M.S. program.

The programs are very flexible to encourage interdisciplinary studies and research. Opportunity also exists for specializing in:

1. computational science and engineering and
2. energy and sustainability engineering within the department’s graduate programs via the Computational Science and Engineering (CSE) Option (http://cse.illinois.edu/education-programs/graduate-program) and the Energy and Sustainability Engineering (EaSE) Option. (http://ease.illinois.edu)

The Medical Scholars Program (https://www.med.illinois.edu/mdphd) permits highly qualified students to integrate the study of medicine with study for a graduate degree in a second discipline, including Electrical and Computer Engineering.

For complete program information, visit the Electrical and Computer Engineering graduate program Web site (http://www.ece.illinois.edu/students/grad).

Admission

Applicants must have completed an electrical engineering curriculum or a computer engineering curriculum substantially equivalent to those of the University of Illinois at Urbana-Champaign. A minimum grade point average of 3.00 (A = 4.00) for the last two years of undergraduate study is required. However, because of space limitations, applicants with GPAs below 3.50 are rarely admitted. All applicants must submit scores from the general test of the Graduate Record Examination (GRE) (http://www.ets.org).

A master’s degree is required for admission to the PhD program. Applicants with master’s degrees are admitted only if a faculty member is willing to serve as the Ph.D. thesis advisor. Accordingly, such applicants should write, call, or e-mail prospective Ph.D. advisors and discuss their research interests and potential Ph.D. thesis topics well in advance of application deadlines. Admission for the spring semester is possible, in addition to the usual fall semester admissions.

Graduates of curricula in the physical sciences, mathematics, and computer science may be admitted if they are judged to have the necessary background to profit from graduate work in electrical and computer engineering.

All applicants whose native language is not English must submit a minimum TOEFL (http://www.toefl.org) score of 96 (iBT), 243 (CBT), or 590 (PBT); or minimum International English Language Testing System (IELTS) (http://www.ielts.org) academic exam scores of 6.5 overall and 6.0 in all subsections. Applicants may be exempt from the TOEFL if certain criteria (http://grad.illinois.edu/admissions/instructions/04c) are met. For those taking the TOEFL or IELTS, full admission status (http://grad.illinois.edu/admissions/instructions/04c) is granted for scores greater than 102 (TOEFL iBT), 253 (TOEFL CBT), 610 (TOEFL PBT), or 6.5 (IELTS). Limited status (http://grad.illinois.edu/admissions/instructions/04c) is granted for lesser scores and requires enrollment in English as a Second Language (ESL) courses (http://linguistics.illinois.edu/students/esl/guidelines) based on an ESL Placement Test (EPT) taken upon arrival to campus.

Students may apply to the Medical Scholars Program prior to beginning graduate school or while in the graduate program. Applicants to the Medical Scholars Program must meet the admissions standards for

Information listed in this catalog is current as of 10/2017
and be accepted into both Electrical and Computer Engineering and the College of Medicine. An application to the Medical Scholars Program will also serve as the application to the Electrical and Computer Engineering graduate program. Further information on this program is available by contacting the:

Medical Scholars Program
125 Medical Sciences Building
(217) 333-8146
mspo@illinois.edu

**Medical Scholars Program**

Students in the Medical Scholars program must meet the specific requirements for both the medical [https://www.med.illinois.edu/mdphd](https://www.med.illinois.edu/mdphd) and graduate degrees. On average, students take eight years to complete both degrees. The first year of the combined program is typically spent meeting requirements of the Electrical and Computer Engineering graduate degree.

**Faculty Research Interests**

Research interests of the Electrical and Computer Engineering faculty include the broad areas of study described in the graduate programs section and more. Many faculty members hold affiliate status with other departments, and a number of faculty members from other departments hold affiliate status with the department. In addition, some faculty hold appointments in the Beckman Institute for Advanced Science and Technology, the Coordinated Science Laboratory, the Materials Research Laboratory, and the Micro and Nanotechnology Laboratory. All these affiliations provide opportunities for graduate student appointments to conduct research. For a detailed list of current research interests of the faculty, visit the department's research Web site (http://ece.illinois.edu/research).

**Centers, Programs, and Institutes**

There are numerous interdisciplinary programs, laboratories, and centers for research within the department. These are described at the department's research Web site (http://ece.illinois.edu/research).

**Financial Aid**

Fellowships, research assistantships, and teaching assistantships (all of which include tuition and partial fee waivers) are available for the majority of students who are admitted to the M.S. and Ph.D. programs. International applicants generally are not awarded teaching assistantships but are eligible for the other forms of financial aid. All applicants, regardless of U.S. citizenship, whose native language is not English and who wish to be considered for teaching assistantships must demonstrate spoken English language proficiency [http://grad.illinois.edu/admissions/taengprof.htm](http://grad.illinois.edu/admissions/taengprof.htm) by achieving a minimum score of 24 on the speaking subsection of the TOEFL IBT or 8 on the speaking subsection of the IELTS. For students who are unable to take the IBT or IELTS, a minimum score of 5 is required on the EPI test [http://cte.illinois.edu/testing/oral_eng/epi_overview.html](http://cte.illinois.edu/testing/oral_eng/epi_overview.html), offered on campus. All new teaching assistants are required to participate in the Graduate Academy for College Teaching [http://cte.illinois.edu/programs/ta_train.html](http://cte.illinois.edu/programs/ta_train.html) conducted prior to the start of the semester.

Please see the financial aid eligibility for the M.Eng. in Electrical and Computer Engineering under the "Masters" tab.

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**Doctor of Philosophy in Electrical and Computer Engineering**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
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<tbody>
<tr>
<td>ECE 599</td>
<td>Thesis Research (min-max applied toward degree)</td>
<td>32-40</td>
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<tr>
<td>ECE 500</td>
<td>ECE Colloquium (registration for 0 hours every term while in residence)</td>
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<tr>
<td></td>
<td>3 permanent 500-level courses in 3 different Ph.D. Breadth Requirement areas <a href="http://www.ece.illinois.edu/students/grad/overview/#breadth">http://www.ece.illinois.edu/students/grad/overview/#breadth</a></td>
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</tr>
<tr>
<td></td>
<td>Elective courses (subject to Other Requirements and Conditions below)</td>
<td>12-20</td>
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<td></td>
<td>Total Hours</td>
<td>64</td>
</tr>
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**Other Requirements and Conditions**

Other Requirements and Conditions may overlap

Credit in ECE 415, ECE 445, ECE 590 (seminar), ECE 596, ECE 597 (individual study), PHYS 404, PHYS 435, and PHYS 436, STAT 400, or any other seminar or individual study course does not count toward the degree. At least one ECE 500-level course must be taken.

No course used to fulfill any degree requirement may be taken using the "Credit/No Credit" option.

A Masters degree is required for admission to the Ph.D. program.

Ph.D. exam and dissertation requirements:

Qualifying exam

Preliminary exam

Final exam or dissertation defense

Dissertation deposit

Minimum GPA: 3.0

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1 For additional details and requirements refer to the department's [Graduate Study Manual](http://www.ece.illinois.edu/academics/grad/overview) and the [Graduate College Handbook](http://grad.illinois.edu/gradhandbook).

2 Qualifying Exam information [http://www.ece.illinois.edu/students/grad/QualExams/qual.html](http://www.ece.illinois.edu/students/grad/QualExams/qual.html)