College of Engineering

http://engineering.illinois.edu/academics/graduate/

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Major: Engineering
Degrees Offered: M.Eng. with concentrations available in Energy Systems (http://catalog.illinois.edu/graduate/graduate-majors/npre/ms-engineering-concentration-energy-systems) and in Computational Engineering (http://catalog.illinois.edu/graduate/graduate-majors/mechse/computational-eng)

A graduate concentration in Computational Science and Engineering, which is not a part of the M.Eng. in Engineering degree, is administered at the college level through CSE and is available for several programs within the College of Engineering and the College of Liberal Arts and Sciences.

Graduate Degree Programs

The College of Engineering offers a Master of Engineering (M.Eng.) degree program for students whose primary intent is a professional career in industry or government. This degree differs from the Master of Science (M.S.) degree in that it is a terminal degree and not a pathway to a doctoral program. The Major in Engineering for the M.Eng. degree requires the selection of an interdisciplinary concentration.

Admission

Students with bachelor’s or master’s degrees in engineering or related sciences will be considered for admission if they have a grade point average of at least 3.00 (A = 4.00) for the last two years of undergraduate study. Admission is possible for the both the fall and spring semesters. Full details of admission requirements are on the Web page of the department offering the concentration.

All applicants whose native language is not English must submit a minimum TOEFL (http://www.toefl.org) score of 103 (iBT), 257 (CBT), or 613 (PBT); or minimum International English Language Testing System (IELTS) (http://www.ielts.org) academic exam scores of 7.0 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. Full admission status (http://grad.illinois.edu/admissions/instructions/04c) is granted for those meeting the minimum requirements and having taken the TOEFL or IELTS since the scores required for admission to M.Eng. are above the minimum scores demonstrating an acceptable level of English language proficiency.

Master of Engineering in Engineering, must include a Concentration

Professional Development (an internship with a company, laboratory, or agency with a subsequent archiveable report; a design project; or business-oriented or leadership courses)

Concentration hours 28

Technical course work in primary area and one course from outside the primary area (12-20 hours)

Elective courses 0-8 hours chosen in consultation with advisor.

Total Hours 32

Other Requirements and Conditions

Other Requirements and Conditions may overlap

A concentration is required.

A minimum of 12 500-level credit hours with a minimum of 8 500-level credit hours applied toward the concentration.

A minimum of 8 hours must be in ENG or the home unit of the concentration.

Minimum program GPA: 3.0

1 For additional details and requirements, please refer to the Web page of the concentration’s home unit and the Graduate College Handbook (http://grad.illinois.edu/gradhandbook).

Available Concentrations:

• Computational Engineering (http://catalog.illinois.edu/graduate/graduate-majors/mechse/computational-eng)
• Energy Systems (http://catalog.illinois.edu/graduate/graduate-majors/npre/ms-engineering-concentration-energy-systems)

Computational Science and Engineering

Note: This concentration is not part of the M.Eng. in Engineering degree program.

The heart of Computational Science and Engineering (CSE) is to develop innovative ways of solving engineering and scientific problems using computation as a tool. This new form of science compresses the development process in engineering and engenders knowledge discovery with a new paradigm in many areas because it enables “virtual experiments” and helps focus physical experiments to reduce or eliminate trial-end-error laboratory-based approaches. Further, it teaches students to solve complex problems with prevailing computer technology.

The CSE graduate concentration is designed to provide graduate students with a solid base in problem-solving using computation as a major tool for modeling complicated problems in science and engineering. This concentration requires students to complete 16 graduate credit hours, which are outlined below. Courses taken toward this concentration will count towards the student’s graduate degree.

For more information regarding the CSE Graduate Concentration, visit the Computational Science and Engineering website (http://cse.illinois.edu), or contact the CSE Office at 217-333-3247 or cse@cse.illinois.edu.

Core Course Work: Complete two courses (4 hours each) from the list below.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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<tbody>
<tr>
<td>CSE 401</td>
<td>Numerical Analysis</td>
</tr>
<tr>
<td>CSE 402</td>
<td>Parallel Progrmg: Sci &amp; Engrg</td>
</tr>
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</table>

Information listed in this catalog is current as of 06/2017
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSE 408</td>
<td>Applied Parallel Programming</td>
</tr>
<tr>
<td>CSE 510</td>
<td>Numerical Methods for PDEs</td>
</tr>
<tr>
<td>CSE 527</td>
<td>Scientific Visualization</td>
</tr>
</tbody>
</table>

**Computing Elective**: 8

Complete two courses (4 hours each) from the approved list. The application coursework must be distinct from the core courses (no double-counting is allowed).

**Total Hours**: 16

**Additional Requirement**

- **M.S. and Ph.D. Thesis Requirement**: The graduate thesis must have a significant computational component, and the thesis committee must include at least one CSE-affiliated faculty.
- **M.S., Non-thesis Requirement**: Must complete a 4-hour independent study/Capstone Project course, where the project is supervised by a CSE-affiliated faculty. The independent study project must comprise sufficient computational work, to be designed in consultation with the faculty supervisor overseeing the independent study.

1. Computing elective course to be selected from the list of CSE Application Courses, available on the approved list (http://cse.illinois.edu/education-programs/certificate-programs/graduate-certificate-option/grad-certificate-and-concentrat).