Chemical and Biochemical Engineering, M.S.

The Department of Chemical and Biochemical Engineering provides a stimulating academic community where students engage in a highly personalized learning and research environment. The Master of Science program provides students with opportunities to obtain specialized knowledge and expertise through advanced coursework in chemical engineering and related disciplines, to engage in interdisciplinary research opportunities (thesis option), and to impact their communities through service learning. The department emphasizes research, since most opportunities for graduates are in research and development.

Faculty within the department have focused research projects in biological and pharmaceutical systems, clean energy and catalysis, air quality and climate, polymeric and advanced materials, quantum chemical simulation, and remote sensing; see Graduate Program on the Department of Chemical and Biochemical Engineering website.

Requirements

The Master of Science program in chemical and biochemical engineering requires a minimum of 30 s.h. in approved graduate courses with or without thesis, plus 3-5 s.h. of required seminars (nonthesis and Undergrad to Grad students complete 3 s.h.; thesis students complete 3-5 s.h.). Students who pursue the thesis option may earn up to 6 s.h. in CBE:5999 M.S. Thesis Research: Chemical and Biochemical Engineering. All students must maintain a cumulative g.p.a. of at least 3.00.

Students who receive assistantships, fellowships, or other awarded financial support are expected to pursue an advanced degree with thesis.

The M.S. with a major in chemical and biochemical engineering requires the following coursework:

All students select one course in each of the areas below. They must earn a cumulative g.p.a. higher than 3.25 in those courses. Students earn the remainder of credit for the degree in elective courses and research.

Transport Phenomena

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CBE:5115</td>
<td>Transport Phenomena I</td>
<td>3</td>
</tr>
<tr>
<td>BME:5430</td>
<td>Biotransport</td>
<td>3</td>
</tr>
<tr>
<td>ME:5143</td>
<td>Computational Fluid and Thermal Engineering</td>
<td>3</td>
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Additional Requirements

All thesis students must take ENGR:7270 Engineering Ethics (1 s.h.) during their first semester and CBE:5000 Seminar in Chemical and Biochemical Engineering (1 s.h.) each semester in residence. Nonthesis students must take CBE:5100 Graduate Professional Development Seminar (1 s.h.) in each of their final two semesters in the program.

Students in the nonthesis program may petition for entry into the thesis program or the Ph.D. program by requesting a change of status through the Graduate College. The request is reviewed by the Graduate Admissions Committee. If approved by the committee, the request is forwarded to the chemical and biochemical engineering faculty for final approval. Students then are assigned to research advisors as though they are newly admitted graduate students. For a detailed description of program requirements, see Graduate Program on the Department of Chemical and Biochemical Engineering website.

All students must pass a final examination.
Admission

Applicants must meet the admission requirements of the Graduate College; see the Manual of Rules and Regulations on the Graduate College website.

Applicants must provide the following:

• Completed application form.
• Unofficial transcript(s). If admitted, official transcripts are required before enrollment. For international students, all academic records should bear the original stamp or seal of the institution and the signature of a school official. Documents not in English must be accompanied by a complete, literal, English translation, certified by the issuing institution.
• Official Graduate Record Examination (GRE) General Test scores (verbal and quantitative) from Educational Testing Services (the University's institutional code is 6681) or International English Language Testing System (IELTS).
• Statement of purpose.
• Three letters of recommendation.
• Test of English as a Foreign Language (TOEFL) scores for applicants whose first language is not English.

Applicants should have a B.S. degree in chemical engineering or a related discipline with satisfactory grades from a recognized college or university in the United States and a cumulative g.p.a. of at least 3.00 on a 4.00 scale. Graduates of non-U.S. universities may be accepted, depending on evaluation of their records. Applicants who do not meet these requirements may be granted conditional admission by the Graduate Admissions Committee.

Graduate courses in chemical and biochemical engineering are designed for students who have an undergraduate background in chemical engineering. Exceptional students from other areas also may apply for admission. If admitted, they may be required to take specific undergraduate courses to prepare them for graduate coursework.

Financial Support

Full financial support is available to admitted M.S. thesis students in the form of teaching assistantships, research assistantships, and fellowships. The department provides up to two years of support for all full-time M.S. thesis students who are making normal progress toward the degree, exhibit satisfactory performance in all duties, and maintain appropriate professional conduct. Students admitted to the nonthesis M.S. or Undergrad to Grad (U2G) programs are not guaranteed department financial support.

Career Advancement

Chemical and biochemical engineers work in a wide range of industries, including petroleum and specialty chemical production, polymer and plastic production, food processing, energy, microelectronics production, pharmaceutical production, biochemical processing, and environmental compliance. Potential jobs include production, process development, plant design and construction, and fundamental research. The engineering profession also is a foundation for a variety of careers in medicine, law, government, and consulting. Many experienced chemical and biochemical engineers move through management ranks to high-level administrative positions. Faculty mentors assigned to graduate students aid in their professional development.

Students are exposed to opportunities through seminar speakers who have relevant expertise and are invited to campus.

Engineering Career Services develops and promotes experiential education and professional opportunities for students in the College of Engineering. Professional staff coordinate the college’s co-op and internship program, engage in employer outreach, and provide opportunities for students to network with employers, including an engineering career fair each semester and other programming related to career development. Engineering Career Services also offers individual advising and class presentations on résumé and cover letter preparation, job and internship search strategies, interviewing skills, and job offer evaluation.

The Graduate College offers numerous career advancement opportunities and professional development programs for graduate students. For ongoing program offerings, news, and announcements, see Grad Success Center on the Graduate College website.