Department of Chemical and Biological Engineering

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The department offers graduate programs leading to the Master of Science in Chemical Engineering degree and a Master of Science degree in Environmental Engineering. The department participates in the Doctor of Philosophy degree in Engineering through the College of Engineering, with options available in Chemical Engineering and Environmental Engineering.

Admission (M.S. and Ph.D.)

Students may enter the Master of Science or Doctoral programs with a bachelor’s degree in Chemical Engineering or other engineering or science discipline. Non-chemical engineering students wishing to pursue a master’s program may require limited remedial coursework. Students may be admitted directly to the doctoral program without a master’s degree.

The Department of Chemical and Biological Engineering has the following minimum requirements for admission to the graduate program:

- 3.0 GPA in undergraduate program (based on 4.0)
- GRE Scores (148 verbal, 144 quantitative)
- International Applicants: TOEFL (internet exam - 80, paper exam - 550, computerized exam - 213) or IELTS score of 7.0 or higher - required for non-native speakers of English

Note: Typical scores for admitted graduate students are well above these minima.

For further information, refer to Admission Policies and Application Requirements section of the department webpage.

Deadlines

Deadline for consideration for Assistantships

- Fall Semester: February 1
- Spring Semester: August 1

Domestic Applicants

- Fall Semester: July 1
- Spring Semester: November 1
- Summer Semester: March 15

International Applicants

- Fall Semester: May 1
- Spring Semester: September 15
- Summer Semester: January 15

Research

This degree involves research in transport phenomena in complex systems, materials, biofilms, biochemical transformation, biotechnology, remediation of hazardous wastes, and environmental engineering. Research topics include extremophilic bioprocessing, in situ biocatalyzed heavy metal biotransformations in natural and engineered biological systems, biomaterials, biorheology, colloidal system dynamics, durability of materials, surface interactions, membrane materials, composite materials, separations, metabolic engineering, metabolic systems analysis, biofuels processing.

Some departmental research is conducted in collaboration with the Center for Biofilm Engineering, the Thermal Biology Institute and MSU’s Surface Science Program. Research also includes materials science and engineering for energy applications including: high temperature corrosion and corrosion protection, advanced physical vapor deposition (PVD) technologies, and sustainable energy.

Financial Assistance

Research and teaching assistantships and scholarships are available on either a 9-month or a 12-month basis; only MS and Ph.D. candidates are eligible.

Degree Offered

- M.S. in Chemical Engineering (http://catalog.montana.edu/graduate/engineering/chemical-biological-engineering/ms-chemical-engineering)
- M.S. in Environmental Engineering (http://catalog.montana.edu/graduate/engineering/environmental-engineering)
- Master of Engineering in Chemical Engineering (http://catalog.montana.edu/graduate/engineering/chemical-biological-engineering/master-engineering-chemical-engineering)
- Master of Engineering in Bioengineering (http://catalog.montana.edu/graduate/engineering/chemical-biological-engineering/master-engineering-bioengineering)
- Ph.D. in Chemical Engineering (http://catalog.montana.edu/graduate/engineering/chemical-biological-engineering/master-engineering-chemical-engineering)
- Ph.D. in Environmental Engineering (http://catalog.montana.edu/graduate/engineering/environmental-engineering)
- Ph.D. in Materials Science (http://catalog.montana.edu/graduate/letters-science/chemistry-biochemistry/phd-materials-science)

Program Requirements (M.S. and Ph.D.)

The Master of Science program requires 30 credits total (including a minimum of 10 credits of ECHM 590 Master’s Thesis). One half of total credits required for the degree must be at the 500 level. The chemical engineering program for students from other disciplines requires appropriate background remedial coursework in addition to the previously listed requirements.

The Ph.D. program requires specific coursework, depending on the option, 60 total credits (18 thesis credits).

Doctoral candidates will register for dissertation research in one of the five departments offering the above options. Course requirements for the Engineering Ph.D. include completion of 2 credits of ENGR 610 Rsch & Mthds in Engineering, two courses in Mathematical systems, a minimum of eighteen (18) credits of doctoral dissertation, and other courses chosen to support the proposed doctoral program that are approved by the candidate’s committee. All doctoral candidates will be required to pass three examinations: a Ph.D. Qualifying Examination taken during the first year of the student’s doctoral program, a Ph.D. Comprehensive Examination taken within two years of qualifying for the doctoral program, and a Ph.D. Dissertation Defense. Students are expected to be familiar with the individual program degree requirements as well as those of The Graduate School.