

Chemical Engineering

College of Engineering

The Department of Chemical and Materials Engineering offers programs leading to the M.S. and Ph.D. degrees in Chemical Engineering, with research specialization in the following areas:

- Biomaterials
- Drug Delivery
- Energy and Batteries
- Environmental Engineering
- Interfacial Engineering
- Materials Synthesis and Nanomaterials
- Membranes/Advanced Separations
- Molecular Dynamics
- Nanomaterials
- Polymer Science and Engineering
- Process Design
- Water Treatment

Admission Requirements

Admission to the M.S. and Ph.D. degree programs is on a competitive basis, and financial assistance is available through teaching and research assistantships, as well as a limited number of fellowships. Applicants should have a minimum grade point average of 3.0/4.0 on all undergraduate work, and should hold a Bachelor of Science degree in Chemical Engineering or its equivalent. Meeting the minimum requirements does not guarantee admission, as acceptance is on a competitive and space-available basis. Students with undergraduate majors not in chemical engineering (for example, chemistry or physics) may be eligible for direct admission into the M.S. or Ph.D. graduate programs; these individuals are expected to complete a program of selected undergraduate core courses during their first year of study.

Master of Science

The M.S. degree in Chemical Engineering requires 24 hours of course work, plus completion of an acceptable thesis (Plan A). This course work includes the chemical engineering graduate core, which is comprised of CME 505, CME 620, CME 630, CME 650, and a graduate-level mathematics elective. In certain exceptional cases (as determined by the faculty), a non-thesis M.S. may be undertaken (Plan B). The non-thesis option requires 30 hours of course work which includes the chemical engineering core, as well as 3 hours of CME 780 (Special Problems in Chemical Engineering). The non-thesis option is only available to those students with prior research or industrial experience. For both Plan A and Plan B, at least half of all graduate course work must be at the 600 level or above.

Doctor of Philosophy

The Ph.D. degree is a research degree granted on the basis of broad knowledge of chemical engineering and specialized study in a specific area of interest. The student must conduct original and significant research and must submit and defend a dissertation based on that research. Course work requirements include the chemical engineering graduate core, and additional courses so as to fulfill the pre-candidacy residency requirements set forth by the Graduate School; the plan of study is developed by the student in consultation with the research advisor and the Director of Graduate Studies. Advancement to doctoral candidacy is contingent upon successful completion of both the written and oral portions of the Qualifying Examination. The written portion addresses three fundamental areas of the chemical engineering

discipline: Kinetics and Reactor Design, Thermodynamics, and Transport. The oral portion consists of a presentation and defense of the student's proposed dissertation research; a prospectus prepared by the student must be submitted to the doctoral advisory committee prior to the examination. There is no language requirement for the M.S. or Ph.D. degrees in Chemical Engineering.

A wide selection of research topics is available under the direction of the Chemical Engineering faculty. Recent graduate-level elective courses include Biochemical Engineering, Biomedical Micro & Nanotechnology, Computational Materials Science, Drug Delivery, Energy Systems, Interfacial Engineering, Membrane Science and Technology, and Polymer Processing.

For more information please contact the Director of Graduate Studies.

Graduate Courses

CME 404G	Polymeric Materials (Same As Mse 404G)	(3)
CME 505	Analysis Of Chemical Engineering Problems	(3)
CME 550	Chemical Reactor Design	(3)
CME 554	Chemical And Physical Processing Of Polymer Systems (Same As ME/MFS/MSE 554)	(3)
CME 556	Introduction To Composite Materials (Same As ME/MSE 556)	(3)
CME 580	Design Of Rate And Equilibrium Processes For Water Pollution Control	(3)
CME 599	Topics In Chemical Engineering	(3)
CME 620	Equilibrium Thermodynamics	(3)
CME 622	Physics Of Polymers (Same As MSE 622)	(3)
CME 630	Transport I	(3)
CME 650	Advanced Chemical Reactor Design	(3)
CME 680	Biochemical Engineering (Same As BAE 680)	(3)
CME 748	Master's Thesis Research	(0)
CME 749	Dissertation Research	(0)
CME 767	Dissertation Residency Credit	(2)
CME 768	Residence Credit For The Master's Degree	(1-6)
CME 769	Residence Credit For The Doctor's Degree	(0-12)
CME 771	Seminar	(0)
CME 779	Membrane Sciences Colloquium (Same As Bch/Che/Pha/Phr 779)	(1)
CME 780	Special Problems In Chemical Engineering	(1-3)
CME 790	Research In Chemical Engineering	(1-9)