

Curriculum

The course work portions of the MS and PhD programs provide a strong core in advanced chemical engineering concepts complemented by a diverse offering of elective courses from across the Department, the College of Engineering, and the broader University. All graduate students are expected to take four core courses (3 credit hours each) unless similar courses have already been completed:

- MATH 5510. Advanced Math for Engineers
- CHE 6010. Advanced Chemical Engineering Thermodynamics
- CHE 6040. Intermediate Fluid Mechanics
- CHE 6210. Advanced Kinetics

These courses contribute 12 of the course credit hours required for completion of a MS or PhD degree.

A total of 24 course credit hours are required for completion of the MS degree. At least 15 of these course credit hours must be from 6000- or 7000-level coursework. In addition, MS students complete 6 credits of research/thesis (CHE 6990), for a total of 30 credits for the degree.

A total of 48 credits (post MS) are required for completion of a PhD degree, or for direct-admit PhD students, 72 credits post BS. For those PhD students matriculating with an MS degree, a combination of 18 to 24 course credits and 24 to 30 research/dissertation credits (CHE 7990) are to be completed to reach the required total of 48 credits. No 5000-level courses are to be used to meet the minimum course requirements. For the 18 to 24 course credits, at least 6 course credits must be from 7000-level coursework.

For direct-admit PhD students, a combination of 42 to 48 course credits and 24 to 30 research/dissertation credits are required for the 72 total credits. Up to 9 course credits can be from 5000-level coursework. At least 6 of the course credit hours must be from 7000-level coursework.

Elective courses to fulfill the remainder of the course credit hour requirements are selected by the student in consultation with his or her research advisor. Elective courses offered within the Department in the last few years include:

- CHE 5210. Chemical Reaction Engineering
- CHE 5330. Polymer Engineering
- CHE 5661. Transport in Biochemical / Biological Processes
- CHE 6810. Advanced Fuel Cells
- CHE 6810. Advanced Issues in Polymer Engineering
- CHE 6810. Advanced Protein Biophysics and Simulation
- CHE 6810. Biofuels and the Rural Socioecology
- CHE 6810. Catalytic Systems
- CHE 6810. Modeling of Chemical Engineering Systems
- CHE 6810. Physical Transport I
- CHE 6810. Special Topics in Chemical Engineering
- CHE 7970. Survey of Protein Engineering
- CHE 7970. Advanced Application of Protein Engineering
- CHE 7970. Electrokinetics-Hydrodynamics
- CHE 7970. STEM Design: Team Management & Assessment
- CHE 7980. Advanced Kinetics in the Environment

Examples of electives taken by chemical engineering graduate students outside the Department include:

- BIOL 5040. Immunology
- BGMT 6200. Organizational Leadership
- EDPY 6310. Educational Statistics
- EVS 7900. Scientific Writing and Grantsmanship
- CEE 5430. Water / Wastewater Treatment
- CEE 6200. Statistical Inference for Engineers
- CEE 6900. Introduction to Finite Element Analysis
- CHEM 5210. Chemistry of Polymers
- CHEM 5620. General Biochemistry
- CHEM 6410. Advanced Analytical Chemistry
- CHEM 6610. Advanced Biochemistry
- MATH 6510. Finite Difference Solutions
- MATH 6810. Partial Differential Equations
- ME 6360. Introduction to Continuum Mechanics
- ME 6810. Advanced Materials Science I
- NURS 6103. Advanced Pathophysiology
- NURS 6104. Advanced Pharmacology

To facilitate transition into graduate-level research, a 1 credit hour graduate seminar course (CHE 6920) is also suggested for completion during the first fall semester of enrollment for all graduate students.