Duluth Campus

Chemical Engineering M.S.Ch.E

Chemical Engineering

Swenson College of Science and Engineering

Link to a list of faculty for this program.

Contact Information:
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- Program Type: Master's
- Requirements for this program are current for Fall 2020
- Length of program in credits: 30
- This program does not require summer semesters for timely completion.
- Degree: Master of Chemical Engineering

Along with the program-specific requirements listed below, please read the General Information section of the catalog website for requirements that apply to all major fields.

The MSChE degree combines scholarship and research in a program oriented towards students and engineering practitioners in the private and public sectors who are interested in advanced coursework and applied research. The program requires 30 credits of coursework and applied research focusing on core departmental strengths of process modeling and simulation, environmental monitoring and remediation, and transport phenomena. There are two options for completing an MSChE degree: Plan A (thesis option), and Plan B (project option). Plan A involves writing and defending a thesis which requires in-depth research equivalent to 10 credits out of total 30 credits. Plan B involves a capstone project equivalent to 3 credits (out of 30 total credits) and targets those students or practicing engineers who wish to have a hands-on learning experience solving technical problems preferably teaming up with an industrial counterpart.

Undergraduate students in the Chemical Engineering program who are interested in pursuing the Master of Chemical Engineering at UMD may apply for admission to the Integrated Undergraduate/Graduate (IUS) Program. Students in the IUG Program start their graduate coursework prior to the completion of their undergraduate degree and may apply up to 9 credits of coursework to both their undergraduate B.S.Ch.E. and graduate M.S.Ch.E. degrees. Admission to the IU Program is limited to highly qualified upper division undergraduates.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Prerequisites for Admission

The preferred undergraduate GPA for admittance to the program is 3.00.

Preferred minimum GPA is 3.00 in engineering and 3.25 in science.

Other requirements to be completed before admission:
B.S. in ChE or other Engineering from an ABET accredited institution or admission to the integrated undergraduate/graduate option.

Other undergraduate degrees may be accepted with additional coursework in ChE required prior to beginning the program requirements for the MS degree. Additional course work may include, ChE 2111 Material and Energy Balances, ChE 2121 Thermodynamics, ChE 3111 Fluid Mechanics, ChE 3112 Heat and Mass Transfer, ChE 4111 Separations, ChE 4301 Reaction Engineering.

Examples of such degree programs include B.S. in Biology, Biochemistry, Chemistry, Geology, or Physics.

The GRE (Graduate Record Exam) is required. Preferred minimum scores are Verbal=153 (550-old scoring system), Quantitative=160 (650-old scoring system).

For international applicants whose native language is not English, a TOEFL score preferred performance minimum is 213 on the computer-based test

Special Application Requirements:
The earned bachelors degree required may be waived only for current students in the B.S.Ch.E. program and who are applying through the Integrated Undergraduate/Graduate (IUG) option.

Applicants must submit their test score(s) from the following:
- GRE
  - General Test - Verbal Reasoning: 153
  - General Test - Quantitative Reasoning: 160

International applicants must submit score(s) from one of the following tests:
- TOEFL
  - Internet Based - Total Score: 213

Key to test abbreviations(GRE, TOEFL).

For an online application or for more information about graduate education admissions, see the General Information section of the catalog website.

Program Requirements

Plan A: Plan A requires 14 to 20 major credits, 0 to 6 credits outside the major, and 10 thesis credits.The final exam is oral.

Plan B: Plan B requires 24 to 30 major credits and 0 to 6 credits outside the major.The final exam is oral. A capstone project is required.
Capstone Project: TBD

This program may be completed with a minor.

Use of 4xxx courses toward program requirements is permitted under certain conditions with adviser approval.

A minimum GPA of 3.0 is required for students to remain in good standing.

Students with a BS in the sciences are expected to have knowledge of material and energy balances, heat and mass transfer, fluid mechanics, thermodynamics, chemical reaction engineering, and process control. Proficiency will be determined by the completion of at least three undergraduate courses as determined by the Major Advisor and Program of Study Committee.

Only 6 elective credits may be taken at the 4xxx level. All other courses must be taken at the 5xxx level or higher.

Core Requirements (11 cr)
Must take CHE 8150 for a total of 2 credits.
CHE 8150 - Seminar (1.0 cr)
Take 3 or more course(s) totaling 9 or more credit(s) from the following:
- CHE 5021 - Transport Phenomena (3.0 cr)
- CHE 5031 - Chemical Engineering Analysis (3.0 cr)
- CHE 5121 - Advanced Thermodynamics (3.0 cr)
- CHE 5301 - Advanced Chemical Reactor Design (3.0 cr)

Plan A or Plan B
Plan A Requirements
Electives
Take at least 9 credits of electives, in consultation with the advisor.
Thesis Credits
Take at least 10 master's thesis credits
CHE 8777 - Thesis Credits: Master's (1.0 - 10.0 cr)
or **Plan B Requirements**
Required Course
Take 3 credits of CHE 5555.
CHE 5555 - Project Credits: MEng - Chemical Engineering (3.0 - 6.0 cr)
Additional Courses
Take at least 7 additional credits, selected in consultation with the advisor.
Electives
Take at least 9 credits of electives, in consultation with the advisor.