



### ***Twin Cities Campus***

## **Mechanical Engineering M.S.M.E.**

*Mechanical Engineering*

### **College of Science and Engineering**

Link to a [list of faculty](#) for this program.

#### **Contact Information:**

Mechanical Engineering and Industrial Engineering Graduate Programs, University of Minnesota, 1120 Mechanical Engineering, 111 Church Street S.E., Minneapolis, MN 55455 (612-625-2009; fax: 612-624-2010)

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Website: <http://www.me.umn.edu>

- Program Type: Master's
- Requirements for this program are current for Fall 2018
- Length of program in credits: 30
- This program does not require summer semesters for timely completion.
- Degree: Master of Science in Mechanical 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.

Coursework and research for all graduate degrees are offered in bioengineering; biomechanics; combustion; computer-aided design; computer-aided manufacturing; computer graphics; control systems; design; energy conservation; environmental control; environmental engineering; fluid mechanics; heat and mass transfer; history of science and technology; human factors engineering; industrial engineering; innovative methodologies; integration of structural and environmental systems; lubrication; manufacturing engineering; particle technology; plasma chemistry; plasma heat transfer; power, propulsion, and applied thermodynamics; socioeconomic systems; solar energy; solar processing and thermochemistry; statistics; structures; systems dynamics; technology assessment; thermal energy storage; thermal environmental engineering; thermodynamics; transportation; tribology; vibration; and interdisciplinary finite element methodology. Additional instructional and research programs can be formulated.

### **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.

A four-year BS degree in engineering, science, or mathematics.

#### **Special Application Requirements:**

The department offers two options for applying to the masters degree program. The standard application requires a full set of application materials and allows admission to any of the MSME degree options (Plan A, B, or C). The streamlined application offers an abbreviated application process and admission is only for the coursework-only masters degree (Plan C).

The GRE test is not required for applicants to the streamlined application. Students admitted through the streamlined process are not eligible for financial support from the department.

Applications are accepted for fall semester only. The standard application deadline is December 15 and the streamlined application deadline is April 15. Additional information is available at [www.me.umn.edu/education/graduate/prospective/](http://www.me.umn.edu/education/graduate/prospective/)

Applicants must submit their test score(s) from the following:

- GRE

International applicants must submit score(s) from one of the following tests:

- TOEFL
  - Internet Based - Total Score: 79
  - Internet Based - Writing Score: 21
  - Internet Based - Reading Score: 19



- IELTS  
- Total Score: 6.5

Key to [test abbreviations](#)(GRE, TOEFL, IELTS).

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 major credits, 6 credits outside the major, and 10 thesis credits. The final exam is oral.

**Plan B:** Plan B requires 14 major credits and 16 credits outside the major. The final exam is oral.

**Plan C:** Plan C requires 24 major credits and 6 credits outside the major. There is no final exam.

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 2.8 is required for students to remain in good standing.

The MSME requires a minimum of 30 credits and is offered under Plan A (thesis), Plan B (project), and Plan C (coursework only). All three plans require completion of 1-2 graduate seminar credits and one research and professional ethics course. All courses, with the exception of seminars and the ethics course, must be taken on an A/F basis.

### Major Course Credits

Any 5xxx or 8xxx level mechanical engineering course counts toward the major field credit requirement, with the exception of independent research courses. The following courses also meet the requirement for ME graduate course credits.

- [AEM 5401](#) - Intermediate Dynamics (3.0 cr)
- [AEM 5501](#) - Continuum Mechanics (3.0 cr)
- [AEM 8201](#) - Fluid Mechanics I (3.0 cr)
- [AEM 8202](#) - Fluid Mechanics II (3.0 cr)
- [EE 5231](#) - Linear Systems and Control (3.0 cr)
- [EE 8215](#) - Nonlinear Systems (3.0 cr)

### Ethics Course

Take one research and professional ethics course. The following may be used or consult with advisor for further options.

- [ME 8001](#) - Research Ethics and Professional Practice (0.0 cr)

### Seminar

Take 1-2 seminar credits. The following may be used or consult with advisor for further options.

- [ME 8773](#) - Graduate Seminar (1.0 cr)
- [ME 8774](#) - Graduate Seminar (1.0 cr)

### Supporting Program

The remaining course credits may be taken in the major or in any supporting field with significant scientific or engineering content, and may include 6 credits in a minor.

### Use of 4xxx-level Courses

No more than six 4xxx-level course credits may be used for graduate-level credit. Only the following courses are acceptable.

- [AEM 4511](#) - Mechanics of Composite Materials (3.0 cr)
- [AEM 4581](#) - Mechanics of Solids (3.0 cr)
- [CHEM 4502](#) - Introduction to Quantum Mechanics and Spectroscopy (3.0 cr)
- [EE 4541](#) - Digital Signal Processing (3.0 cr)
- [MATH 4512](#) - Differential Equations with Applications (3.0 cr)
- [PHYS 4051](#) - Methods of Experimental Physics I (5.0 cr)
- [PHYS 4101](#) - Quantum Mechanics (4.0 cr)
- [PHYS 4201](#) - Statistical and Thermal Physics (3.0 cr)
- [PHYS 4211](#) - Introduction to Solid-State Physics (3.0 cr)

### Plan A

Requires 14 credits in the major, 6 additional graduate level credits, and 10 thesis credits.

- [ME 8777](#) - Thesis Credits: Master's (1.0 - 18.0 cr)

### Plan B

Requires 14 credits in the major, 16 additional graduate level credits, plus completion of a project or 1-3 Plan B papers, determined in



consultation with the advisor. Up to 4 credits of ME 8794, taken S/N, may be used for the Plan B project  
[ME 8794](#) - Mechanical Engineering Research (1.0 - 4.0 cr)

#### **Plan C**

Requires 24 credits in the major and 6 additional graduate level credits. Up to 4 credits of ME 8794, taken S/N, may be applied to the degree requirements.

[ME 8794](#) - Mechanical Engineering Research (1.0 - 4.0 cr)

### **Program Sub-plans**

A sub-plan is not required for this program.

Students may not complete the program with more than one sub-plan.

#### **Integrated B.M.E./M.S.M.E.**

The Department of Mechanical Engineering offers an integrated bachelor's/master's degree program. The program makes it possible for students to earn a bachelor's degree (BME) and a master's degree (MSME) in Mechanical Engineering in five years. The program has several benefits: a streamlined admissions process from the undergraduate program to the graduate program; graduate student status granted in the senior year; eligibility for teaching and research assistantships; and flexibility in fulfilling required courses for both degrees simultaneously in the last two years of study.

Both the BME and MSME degrees must be completed in their entirety, with no courses shared between them. The graduate degree cannot be earned before the undergraduate requirements are satisfied. Admitted students who decide not to complete the MSME degree are permitted to count credits originally planned for the graduate program toward their undergraduate technical electives.

#### **Eligibility Requirements:**

- Students must be enrolled in the Mechanical Engineering undergraduate program at the University of Minnesota, Twin Cities.
- Students who are within 32 semester credits completing the requirements for the BME degree are eligible to apply.
- Students with a GPA of 3.25 or greater are preferred. For students who have transferred from another institution, at least one semester must be completed at the University of Minnesota, Twin Cities before admission to the program will be granted.