Duluth Campus

Mechanical Engineering M.S.M.E.

UMD Mechanical/Industrial Engineering

Swenson College of Science and Engineering

Link to a list of faculty for this program.

Contact Information:
Email: MSME@d.umn.edu
Website: https://z.umn.edu/MSME_UMD

- Program Type: Master's
- Requirements for this program are current for Fall 2021
- 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.

The MSME combines professional engineering coursework with research in a field within mechanical engineering. Focus areas include thermo/fluids, materials/manufacturing, dynamics/control, and mechanical design and analysis. There are two options for completing an MSME degree: Plan A (thesis option), and Plan B (project option). Plan A includes writing and defending a thesis which requires in-depth research equivalent to 10 credits out of 30 total credits. Plan B includes a capstone project equivalent to 3 credits out of 30 total credits and targets practicing engineers.

Undergraduate students in the Mechanical Engineering program who are interested in pursuing the Master of Mechanical Engineering at UMD may apply for admission to the Integrated Undergraduate/Graduate (IUG) 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.M.E. and graduate M.S.M.E. degrees. Admission to the IUG 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.

Completion of BS degree in mechanical engineering or admission to integrated undergrad/grad program at UMD. Other undergraduate degrees may be accepted; additional coursework may be required.

Graduate Record Examination (GRE) scores are not required for admission, but these scores will be taken into account if they are provided.

Other requirements to be completed before admission:
Applicants must provide two letters of recommendation concerning their academic ability and readiness for graduate education.

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

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

- TOEFL
  - Internet Based - Total Score: 79
- IELTS
  - Total Score: 6.5
- MELAB
  - Final score: 80

Key to test abbreviations(TOEFL, IELTS, MELAB).

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 20 major credits, up to null credits outside the major, and 10 thesis credits.The final exam is written and oral.

Plan B: Plan B requires 30 major credits and up to null credits outside the major.The final exam is written and oral. A capstone project is required.
Capstone Project: Capstone project is 3 credits.

This program may not be completed with a minor.

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

In consultation with the advisor and director of graduate studies, a maximum of 6 4xxx-level credits, a maximum of 12 transfer credits, and a maximum of 6 credits from fields outside mechanical engineering will be considered.

Course Requirements

Plan A

Core Courses

ME 5110 - Analytic Techniques in Mechanical Engineering (3.0 cr)
ME 5120 - Advanced Dynamics and Control (3.0 cr)
ME 5210 - Advanced Thermal Fluid Sciences (3.0 cr)
ME 5220 - Advanced Mechanics of Materials (3.0 cr)

Electives

Take 6 or more credit(s) from the following:
- ME 4112 - Heat and Mass Transfer (3.0 cr)
- ME 4135 - Robotics and Controls (3.0 cr)
- ME 4145 - CAD/CAM (4.0 cr)
- ME 4175 - Machine Design (3.0 cr)
- ME 4365 - Global Sustainability Experience in Design/Manufacturing in Africa (3.0 cr)
- ME 4375 - Pipeline Engineering (3.0 cr)
- ME 5305 - Computational Fluid Dynamics (3.0 cr)
- ME 5315 - Nondestructive Evaluation of Engineering Materials (3.0 cr)
- ME 5325 - Sustainable Energy System (3.0 cr)
- ME 5345 - Smart Materials and Structures (3.0 cr)
- ME 5355 - Gas Turbines (3.0 cr)

Graduate Seminar

Take 2 or more credit(s) from the following:
- ME 8993 - Graduate Seminar (1.0 cr)

Thesis Credits

Take 10 or more credit(s) from the following:
- ME 8777 - Thesis Credits: Master?s (1.0 - 10.0 cr)

or **Plan B**

Core Courses

ME 5110 - Analytic Techniques in Mechanical Engineering (3.0 cr)
ME 5120 - Advanced Dynamics and Control (3.0 cr)
ME 5210 - Advanced Thermal Fluid Sciences (3.0 cr)
ME 5220 - Advanced Mechanics of Materials (3.0 cr)

Electives

Take 15 or more credit(s) from the following:
Take at most 6 credit(s) from the following:
- ME 4112 - Heat and Mass Transfer (3.0 cr)
- ME 4135 - Robotics and Controls (3.0 cr)
- ME 4145 - CAD/CAM (4.0 cr)
- ME 4175 - Machine Design (3.0 cr)
- ME 4365 - Global Sustainability Experience in Design/Manufacturing in Africa (3.0 cr)
- ME 4375 - Pipeline Engineering (3.0 cr)

Take 9 or more credit(s) from the following:
- ME 5305 - Computational Fluid Dynamics (3.0 cr)
- ME 5315 - Nondestructive Evaluation of Engineering Materials (3.0 cr)

- ME 5325 - Sustainable Energy System (3.0 cr)
- ME 5335 - Introduction to Finite Element Analysis (3.0 cr)
- ME 5345 - Smart Materials and Structures (3.0 cr)
- ME 5355 - Gas Turbines (3.0 cr)

Capstone Project

ME 8310 - Mechanical Engineering Capstone Project (3.0 cr)