Duluth Campus

Electrical Engineering M.S.E.E.

Electrical Engineering

Swenson College of Science and Engineering

Link to a list of faculty for this program.

Contact Information:
EE Graduate Program, 271 MWAH, 1023 University Drive, Duluth, MN 55812 (218-726-6830; fax: 218-726-7267)
Email: umdee@d.umn.edu
Website: http://www.d.umn.edu/ee/

- Program Type: Master's
- Requirements for this program are current for Fall 2022
- Length of program in credits: 31
- This program does not require summer semesters for timely completion.
- Degree: Master of Science in Electrical 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 Master of Science in Electrical Engineering (MSEE) combines scholarship and research in a program oriented toward students and engineering practitioners in the private and public sectors who are interested in advanced coursework and applied research. The program focuses on the departmental faculty's research areas of control systems, communications, signal processing, VLSI, nanoscale optoelectronics and photovoltaics, biomedical engineering, and intelligent transportation systems.

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.

An undergraduate degree in electrical engineering, computer engineering, or computer science. Applicants from related majors can apply but may be required to take additional undergraduate courses.

Special Application Requirements:

The GRE is not required.

International and domestic applicants whose first language is not English must submit current score(s) from one of the following tests:

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
  - Reading Score: 6.5
  - Writing 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 21 major credits, 0 credits outside the major, and 10 thesis credits.The final exam is oral.

Plan B: Plan B requires 31 major credits and 0 credits outside the major.The final exam is oral. A capstone project is required.
Capstone Project: The Plan B project comprises 1 to 3 credits of EE 8222, completed in consultation with the advisor. Students are encouraged to collaborate with an industrial counterpart.

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 3.00 is required for students to remain in good standing.

At least 1 semesters must be completed before filing a Degree Program Form.

Courses offered on both the A-F and S/N grading basis must be taken A-F.

The MSEE requires at least 3 8xxx-level course credits (excluding EE 8001 and EE 8222).

A maximum of 6 4xxx-level course credits can be applied to degree requirements. Students in the integrated BSEE/MSEE sub-plan may not apply any 4xxx credits to the MSEE degree.

Coursework

Required Course (1 credit)

Take the following course:

EE 8001 - Graduate Professional Communication Seminar (1.0 cr)

Additional Courses (20 to 29 credits)

Plan A students select 20 credits and Plan B students select 27 to 29 credits from the following in consultation with the advisor. Other courses can be selected with approval by the advisor and director of graduate studies.

EE 4305 - Computer Architecture (4.0 cr)
EE 4321 - Computer Networks (3.0 cr)
EE 4341 - Digital Systems (4.0 cr)
EE 4501 - Power Systems (4.0 cr)
EE 4611 - Introduction to Solid-State Semiconductors (3.0 cr)
EE 4896 - Co-op in Electrical Engineering (1.0 cr)
EE 5151 - Digital Control System Design (3.0 cr)
EE 5161 - Linear State-Space Control Systems (3.0 cr)
EE 5311 - Design of VLSI Circuits (4.0 cr)
EE 5315 - Multiprocessor-Based System Design (3.0 cr)
EE 5477 - Antennas and Transmission Lines (3.0 cr)
EE 5479 - Antennas and Transmission Lines Laboratory (1.0 cr)
EE 5501 - Energy Conversion System (3.0 cr)
EE 5522 - Power Electronics I (3.0 cr)
EE 5533 - Grid- Resiliency, Efficiency and Technology (3.0 cr)
EE 5621 - Microelectronics Technology (3.0 cr)
EE 5741 - Digital Signal Processing (3.0 cr)
EE 5745 - Medical Imaging (3.0 cr)
EE 5765 - Modern Communication (4.0 cr)
EE 5801 - Introduction to Artificial Neural Networks (3.0 cr)
EE 5995 - Special Topics: (Various Titles to be Assigned) (1.0 - 3.0 cr)
EE 8151 - Optimal Control Systems (3.0 cr)
EE 8741 - Digital Image Processing (4.0 cr)
EE 8765 *{Inactive}*(3.0 cr)

Plan Options

Plan A

Thesis Credits

Take 10 master's thesis credits.

EE 8777 - Thesis Credits: Master's (1.0 - 18.0 cr)

-OR-

Plan B

Project Credits (1 to 3 credits)

Take 1 to 3 credits of the following in consultation with the advisor:

EE 8222 - Master's Plan B Research and Design Project (1.0 - 3.0 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.S.E.E./M.S.E.E

The Swenson College of Science and Engineering offers an integrated Bachelor of Science in Electrical Engineering (BSEE) and Master of Science in Electrical Engineering (MSEE) degree. The integrated BSEE/MSEE program offers students the opportunity to earn a bachelor's degree and a master's degree in five years.

The integrated program offers several benefits: streamlined admissions from the undergraduate to the graduate program and flexibility in fulfilling required courses for both degrees during the senior year (up to 9 approved 5xxx credits can be applied to the MSEE).

Eligibility requirements for the integrated program:

Application is open to UMD BSEE students who
· apply at least two semesters before completing the BSEE degree;
· hold a minimum cumulative GPA of 3.30; and
· provide letters of recommendation from two Electrical Engineering faculty members.

Both the BSEE and MSEE degrees must be completed in their entirety. The graduate degree cannot be earned before the undergraduate requirements are satisfied.