Master of Science Engineering
Dr. Mateo Aboy

Program Overview
Title: MS in Engineering (with Specializations)

Department: EERE

Program Overview:

- Highly customizable and modular MS degree.
- Enables to choose coursework from multiple disciplines to design specialties not available in the classical MS degrees.
- The flexibility in the MS in Engineering degree ensures a relevant, up-to-date educational experience, and the ability to meet urgent industry needs in multidisciplinary technical fields.
- The program is designed to provide maximum flexibility while maintaining academic rigor.
Program Objective

Program Educational Objective:

- The MS in Engineering (MSE) at Oregon Tech is designed to prepare engineering professionals with advanced knowledge and skills in high-demand multidisciplinary fields who are ready to assume a broad range of technical and leadership roles.

Sample Program Specialties:

- MSE - Systems Engineering
- MSE - Embedded Systems Engineering & Interconnected Devices
- MSE - Optical Engineering
- MSE - Energy & Power Engineering
- MSE - Energy Storage
- MSE - Automation, Robotics & Control Engineering
- MSE - Cybersecurity
- MSE - Patent Engineering & IP Management
Degree Designation

- Master of Science in Engineering - Specialty Name (e.g., Master of Science in Engineering - Systems Engineering)

- Accepted Abbreviations (Example for Systems Engineering Specialty)
  - M.S. in Engineering - Systems Engineering
  - M.S. Engineering - Systems Engineering
  - M.S.E. Systems Engineering

- MSE Specialties appear in the transcript.
Admission Requirements

Meet Oregon Tech Graduate Admissions Requirements.

BS degree in engineering, physical science, or related technical field (depending on specialty).

Show evidence of 1) potential for graduate level academic work, 2) work experience or potential for success in industry, and 3) demonstrated interest in selected area of specialty. This evidence is to be provided as part of a Personal Statement, Resume, and two Reference Evaluations for Graduate Admission.

Admission Application

MSE Application Form; Official Transcripts; Personal Statement (2 pages maximum).

Resume (3 pages maximum); Two Reference Evaluations for Graduate Admission.

GRE scores: Considered in support of the application to show evidence of potential for graduate success, especially recommended for applicants without work experience or previous graduate level coursework (Optional).

TOEFL scores: required for applicants whose native language is not English.
MSE Program Requirements

- **Minimum Credit Requirement:** 45 credits
  (12-15 graduate courses; quarter system)

- **Specialization Credit Requirement:** 15 or more
  (4 to 5 specialization courses)

- **Residency Requirement:** 30 or more credits at OIT (on campus or online)

- **Credits from Other Universities:** up to 15 credits may be transferred

- **Completion of Approved Plan of Study:**
  - Defined Specialty (Specified Plan of Study)
  - Custom Specialty with Advisory Committee Approval (Advisor(s), Program Director, Department Chair)
Program Director: Prof. Dr. Mateo Aboy

Specialty Directors:
- Systems Engineering: James Eastham
- Embedded Systems & IoT: Prof. Allan Douglas
- Optical Engineering: Prof. Dr. Scott Prahl
- Cybersecurity: Prof. Kris Rosenberg
- Energy Storage: Prof. Dr. Slobodan Petrovich
- Energy & Power Engineering: TBA
- Robotics, Automation & Control: TBA
- Systems Engineering: James Eastham [Online]
- Embedded Systems & IoT: Allan Douglas [Blended]
- Optical Engineering: Scott Prahl [On-Campus, Wilsonville]
- Cybersecurity: Kris Rosenberg [Online]
- Energy Storage: Slobodan Petrovich [Blended, Online]
- Energy & Power Engineering: TBA
- Robotics, Automation & Control: TBA
The following plans of study are shown for illustrative purposes only.

They exemplify how MSE courses can be combined to develop focus areas in order to specialize in one or more fields of engineering.
MSE Program - Plans of Study

- MSE - System Engineering (Fall 2017 - Specialty Director: J. Eastham)
  - SEM521 Systems Engineering (4 cr)
  - SEM522 Advanced Systems Engineering (4 cr)
  - SEM525 Advanced Engineering Management (4 cr)
  - SEM526 Case Studies in Systems Engineering (4 cr)
  - SEM527 Systems Engineering Data Analytics or SEM/Engineering Elective (4 cr)
  - Engineering, Systems Engineering or Technology Management Electives (8 cr)
  - ENGR511 Research Methods & Innovation: Intellectual Property (3 cr)
  - ENGR512 Research Methods & Innovation: Peer-Reviewed Research (3 cr)
  - ENGR513 Research Methods & Innovation: Commercialization (3 cr)
  - Project/Publication/Thesis in Specialization XYZ (8 cr)
MSE Program - Plans of Study

- MSE - Embedded Systems Engineering & Interconnected Devices - Fall 2017 (Specialty Director: A. Douglas)
  - EE5XX Embedded Systems Engineering & IoT Core (16 cr)
    - Embedded Systems Hardware
    - Embedded Systems Software
    - Wireless Communications
    - Sensors & Instrumentation
  - EE5YY Electives (8 credits)
  - SEM521 Systems Engineering (4 cr)
  - ENGR511 Research Methods & Innovation: Intellectual Property (3 cr)
  - ENGR512 Research Methods & Innovation: Peer-Reviewed Research (3 cr)
  - ENGR513 Research Methods & Innovation: Commercialization (3 cr)
  - Embedded & IoT Project (8 cr)
MSE Program - Plans of Study

- MSE - Optical Engineering (45 cr) - Fall 2017 (Specialty Director: S. Prahl)
  - EE548 Geometric Optics (4 cr)
  - EE549 Optical Detection and Radiometry (4 cr)
  - EE550 Physical Optics (4 cr)
  - EE551 Lasers (4 cr)
  - EE552 Waveguides and Fiber Optics (4 cr)
  - EE553 Optical Metrology (4 cr)
  - Electives (4-8)
  - ENGR511 Research Methods & Innovation: Intellectual Property (3 cr)
  - ENGR512 Research Methods & Innovation: Peer-Reviewed Research (3 cr)
  - ENGR513 Research Methods & Innovation: Commercialization (3 cr)
  - Project/Publication/Thesis focused on Optical Engineering (8 cr)
MSE Program - Plans of Study

- MSE - Energy Storage (45 cr) - (Specialty Director: S. Petrovic)
  - REE581 Energy Storage Fundamentals (3 cr)
  - REE582 Introduction to Batteries (3 cr)
  - REE583 Introduction to Fuel Cells (3 cr)
  - REE591 Hydrogen Production and Storage (3 cr)
  - REE592 Advanced Batteries (3 cr)
  - REE593 Advanced Fuel Cells (3 cr)
  - REE515 Energy Engineering I (3 cr)
  - REE515 Energy Engineering II (3 cr)
  - REE517 Energy Engineering III (3 cr)
  - ENGR511 Research Methods & Innovation: Intellectual Property (3 cr)
  - ENGR512 Research Methods & Innovation: Peer-Reviewed Research (3 cr)
  - ENGR513 Research Methods & Innovation: Commercialization (3 cr)
  - Project/Thesis focused on Energy Storage (9 cr)
MSE Program - Plans of Study

- MSE - Energy and Power Systems Engineering (45 cr) [Sample Plan of Study]
  - REE529 Power Systems Analysis (3 cr)
  - REE549 Power System Protection & Control (3 cr)
  - REE569 Grid Integration of Renewables (3 cr)
  - REE527 Wind Power Generators (3 cr)
  - REE547 Electric Power Conversion (3 cr)
  - REE567 Wind Energy Systems Integration (3 cr)
  - REE515 Energy Engineering I (3 cr)
  - REE515 Energy Engineering II (3 cr)
  - REE517 Energy Engineering III (3 cr)
  - ENGR511 Research Methods & Innovation: Intellectual Property (3 cr)
  - ENGR512 Research Methods & Innovation: Peer-Reviewed Research (3 cr)
  - ENGR513 Research Methods & Innovation: Commercialization (3 cr)
  - Project/Thesis focused on Energy & Power Systems Engineering (9 cr)
MSE Program - Plans of Study

- MSE - Automation, Robotics & Control (45 cr)
  - ENGR520 (3 cr) Engineering Modeling
  - ENGR521 (3 cr) Automation Systems
  - ENGR522 (3 cr) Process Control
  - ENGR523 (3 cr) Motion Control & Robotics
  - ENGR5XX (8 cr) Electives
  - ENGR5XX (8 cr) Graduate Project
  - SEM521 Systems Engineering (4 cr)
  - SEM522 Advanced Systems Engineering (4 cr)
  - SEM525 Advanced Engineering Management (4 cr)
  - ENGR511 Research Methods & Innovation: Intellectual Property (3 cr)
  - ENGR512 Research Methods & Innovation: Peer-Reviewed Research (3 cr)
  - ENGR513 Research Methods & Innovation: Commercialization (3 cr)
MSE Program - Plans of Study

- MSE - Systems Engineering & Engineering Patent Practice
  - SEM521 Systems Engineering (4 cr)
  - SEM522 Advanced Systems Engineering (4 cr)
  - SEM525 Advanced Engineering Management (4 cr)
  - PPE521 Introduction to the US Patent System (4 cr)
  - PPE522 Prior Art Searching Practice (4 cr)
  - PPE523 Patent Landscape Analysis & Technology Roadmapping Practice (4 cr)
  - PPE532 Patent Drafting (4 cr)
  - PPE533 Patent Claim Drafting Practice (4 cr)
  - PPE533 Patent Specification Drafting Practice (4 cr)
  - PPE541 Patent Prosecution (4 cr)
  - PPE542 Patent Prosecution Practice (4 cr)
  - PPE543 Patent Capstone Project (4 cr)
  - PPE544 Patent Bar Review (4 cr)
MSE Program - Plans of Study

› MSE - Engineering Patent Practice & Technology Transfer
  ‣ PPE521 Introduction to the US Patent System (4 cr)
  ‣ PPE522 Prior Art Searching Practice (4 cr)
  ‣ PPE523 Patent Landscape Analysis & Technology Roadmapping Practice (4 cr)
  ‣ PPE532 Patent Drafting (4 cr)
  ‣ PPE533 Patent Claim Drafting Practice (4 cr)
  ‣ PPE533 Patent Specification Drafting Practice (4 cr)
  ‣ PPE541 Patent Prosecution (4 cr)
  ‣ PPE542 Patent Prosecution Practice (4 cr)
  ‣ PPE543 Patent Capstone Project (4 cr)
  ‣ PPE541 Technology Transfer & IP Management (5 cr)
  ‣ PPE544 Patent Bar Review (4 cr)
MSE - System Engineering & “Specialization XYZ” Template

- Specialization XYZ (4 courses) - 16 cr
- SEM521 Systems Engineering (4 cr)
- SEM522 Advanced Systems Engineering (4 cr)
- SEM525 Advanced Engineering Management (4 cr)
- ENGR511 Research Methods & Innovation I: Intellectual Property (3 cr)
- ENGR512 Research Methods & Innovation II: Peer-Reviewed Research (3 cr)
- ENGR513 Research Methods & Innovation III: Commercialization (3 cr)
- Project/Thesis in Specialization XYZ (9 cr)
MSE - “Specialization XYZ” Template

- Specialization XYZ (6 courses with contributions from at least 2 faculty) - 24 cr
- SEM521 Systems Engineering (4 cr)
- ENGR511 Research Methods & Innovation I: Intellectual Property (3 cr)
- ENGR512 Research Methods & Innovation II: Peer-Reviewed Research (3 cr)
- ENGR513 Research Methods & Innovation III: Commercialization (3 cr)
- Project/Thesis in Specialization XYZ (9 cr)
Any questions?

- Program
- Specialties
- Faculty
- Resources