

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 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 - Optical Engineering
- ▶ MSE - Systems Engineering
- ▶ MSE - Energy & Power Engineering
- ▶ MSE - Energy Storage
- ▶ MSE - Automation, Robotics & Control Engineering
- ▶ MSE - Cybersecurity
- ▶ MSE - Patent Engineering & IP Management

- ▶ 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.

- ▶ **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
- ▶ **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:
 - 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
 - Engineering Patent Practice: Prof. Dr. Cristina Crespo?

- Embedded Systems & IoT: Allan Douglas [Blended, Online]
- Optical Engineering: Scott Prahl [Wilsonville]
- Systems Engineering: James Eastham [Online]
- Cybersecurity: Kris Rosenberg [Online]
- Energy Storage: Slobodan Petrovich [Blended, Online]
- Energy & Power Engineering: TBA
- Robotics, Automation & Control: TBA
- Engineering Patent Practice: Cristina Crespo? [Online]

Oregon **TECH** MSE Program - Plans of Study

- ▶ MSE - Embedded Systems & Interconnected Devices - Fall 2017 (Specialty Director: A. Douglas)
 - ▶ EE5XX Embedded Systems Sequence (8 cr)
 - ▶ EE5YY Interconnected Devices Sequence (8 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 focused(8 cr)

Oregon **TECH** MSE Program - Plans of Study

- ▶ MSE - Optical Engineering (45 cr) - Fall 2017 (Specialty Director: S. Prahl)
 - ▶ EE548 Optical Detection and Radiometry (4 cr)
 - ▶ EE549 Geometric Optics (4 cr)
 - ▶ EE550 Physical Optics (4 cr)
 - ▶ EE551 Lasers (4 cr)
 - ▶ EE552 Waveguides and Fiber Optics (4 cr)
 - ▶ EE553 Optical Metrology (4 cr)
 - ▶ EE530 Linear Systems & DSP (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 focused on Optical Engineering (8 cr)
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Oregon **TECH** 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 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 focused on Energy Storage (9 cr)

Oregon **TECH** MSE Program - Plans of Study

- ▶ MSE - Energy and Power Systems Engineering (45 cr)
 - ▶ 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 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 focused on Energy & Power Systems Engineering (9 cr)
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Oregon **TECH** 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 I: Intellectual Property (3 cr)
 - ▶ ENGR512 Research Methods & Innovation II: Peer-Reviewed Research (3 cr)
 - ▶ ENGR513 Research Methods & Innovation III: Commercialization (3 cr)
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Oregon **TECH** 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)

Oregon **TECH** 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)

- ▶ Dr. Mateo Aboy, Professor — EE, Signal Processing, Big Data, Patent Law, Technology Management
- ▶ Dr. Hope Corsair, Assistant Professor — REE, Energy Modeling
- ▶ Dr. Cristina Crespo, Associate Professor — EE, Electronics, Patent Law, Technology Management
- ▶ Prof. Allan Douglas, Assistant Professor — EE, Embedded Systems
- ▶ Prof. James Eastham, Assistant Professor — EE, Systems Engineering, Technology Management
- ▶ Dr. Teshome Jiru, Assistant Professor — EE, Green Buildings
- ▶ Dr. Slobodan Petrovic, Associate Professor — REE, Energy Storage
- ▶ Dr. Scott Prahl, Associate Professor — EE, Optical Engineering
- ▶ Dr. Aaron Scher, Assistant Professor — EE, RF, DSP
- ▶ Dr. Claudia Torres, Assistant Professor — REE, Materials Science, Energy Storage
- ▶ Dr. Michael Myers - Advanced Manufacturing & ME
- ▶ **Note:** *The faculty listed represents only the lead faculty participating in the initial program launch (Primarily EERE Faculty at the Wilsonville Campus).*

- ▶ Excellent **Multidisciplinary Faculty Team** as part of the same department
 - PhD/PE faculty in EE, ME, CE, BME, Material Science, etc
- ▶ Excellent branch campus **Location** (Oregon Tech Wilsonville)
 - Silicon Forest (Portland/Wilsonville)
 - Benefits: Working Professional Students, Excellent Adjunct Faculty Pool (and Professors of Practice), Excellent employment opportunities for graduates
- ▶ Excellent **Facilities**
 - Modern classrooms
 - Research-grade labs (e.g., Optical Engineering, Energy Storage, Power Engineering, Embedded)
- ▶ Excellent **Partnerships & Support**
 - Collaboration with other public universities in Oregon: UO & PSU
 - Excellent collaboration with local companies
 - Startup funding provided by ETIC

- ▶ Any questions?
 - ▶ Program
 - ▶ Specialties
 - ▶ Faculty
 - ▶ Resources