

Master of Engineering in Energy, Environmental and Chemical Engineering (EECE)

Washington University in St. Louis – McKelvey School of Engineering

<https://eece.wustl.edu/graduate/programs/Pages/MEng-Energy-Environmental-Chemical-Eng.aspx>

List of Classes for Entering Class: Fall 2026

Curriculum Structure for Master of Engineering in EECE:

- 30 total credits (at least 18 credits from EECE, no more than two 4000-level courses)
 - 15 credits from core courses (see menu of choices below)
 - 15 credits from elective courses
 - All relevant 4000- or 5000-level courses are acceptable with permission of advisor (complete listings at <http://courses.wustl.edu>)
 - Up to 6 elective credits can be from Independent Study courses (EECE 5999)
 - Up to 2 elective credits can be from EECE Seminar course (EECE 5997, 1 credit/semester)
- Optional certificate programs (see pg. 2-3) can help you choose your courses around a theme
- Courses from University College and Engineering Continuing Studies (“U” and “T” designations) will not count towards the degree unless explicitly listed below or if granted special authorization from an advisor.
- Up to six units of graduate coursework from other institutions may be counted as transfer credit upon approval by the advisor. The units may not have been used towards the completion of a bachelor’s degree.
- BS/MEng students are permitted to count 6 credits towards both degrees (4000-level and up)

The list is dynamic and will change from time to time. Students have the flexibility of choosing other classes with the permission of their academic advisor.

Core Courses (total of 5 required courses)

- 1) Technical Core (choose 2, 3 credit classes)
 - a) Introduction to Chemical Engineering (E44 EECE 5001, Fall)
 - b) Transport Phenomena in Energy, Environmental and Chemical Engineering (E44 EECE 5010, Spring)
 - c) Advanced Thermodynamics in EECE (E44 EECE 5020, Fall)
 - d) Aerosol Science and Technology (E44 EECE 5040, Fall)
 - e) Environmental Organic Chemistry (E44 EECE 5120, Fall) OR Aquatic Chemistry (E44 EECE 5050, Fall) *
 - f) Kinetics and Reaction Engineering Principles (E44 EECE 5070, Spring)
 - g) Bioprocess Engineering I: Fundamentals & Applications (E44 EECE 5060, Spring)

**only one of these courses may be counted towards the core course requirement*
- 2) Mathematics (choose 1, 3 credit class)
 - a) Mathematical Methods in Engineering (E44 EECE 5030, Fall)
 - b) Mathematics of Modern Engineering I (E35 ESE 5010, Fall)
 - c) Mathematics of Modern Engineering II (E35 ESE 5020, Spring)
 - d) Statistical Computation (L24 Mathematics 475, Fall)
- 3) Project Management (choose 1, 3 credit class)
 - a) Engineering Project Management (E44 EECE 5230, Summer)
 - b) Project Planning Methodologies (T55 ETEM 523 or T55 ETEM 5530, Fall, Spring)
 - c) Engineering Management & Financial Intelligence (T55 ETEM 5504, Fall, Spring)
- 4) Social, Legal, and Policy Aspects (choose 1, 3 credit class)
 - a) Interdisciplinary Environmental Clinic (L82 EnSt 5830, Fall, Spring – *Note: You must apply to be in this class. See online course description for details.*)
 - b) Health Economics and Policy (B64 MEC 5640, Fall)
 - c) Environmental Health (PHFN 5002, Fall, Spring)
 - d) Leading in a Technology-Rich World (T55 ETEM 5581, Summer)
 - e) Cross Cultural Negotiation (T55 ETEM 5586, Spring, Summer)
 - f) RESET: Renewable Energy and Decarbonizing the Grid (L82 EnSt 4810, Fall)
 - g) Intro to Environmental Law (L82 EnSt 4510, Spring)

Independent Study (up to 6 credits)

Students can sign up for Independent Study (E44 EECE 500) with a professor. The Independent Study could be in the form of a research project, industry-directed consulting, or an internship set up by the student. Approval by the academic advisor (via an Independent Study Petition form, available on the MEng program website or from the Graduate Administrator) is necessary for Independent Study credits. The degree earned will be MEng, even if research is done by the student under supervision of a faculty member. Up to 6 units of Independent Study credits can count towards the MEng degree. It is the student's responsibility to set up their own Independent Study; arrangements, including signing and submission of the Independent Study Petition form mentioned above, should be done in advance (during the prior semester, if possible).

Certificates of Specialization (Optional)

The EECE MEng program offers several certificates (described below) which can be used to guide your choice of courses. Careful choice of courses could result in multiple certificates.

Advanced Energy Technologies (choose total of 5 courses)

Group 1: Fundamentals (choose 2)

- a) Kinetics and Reaction Engineering Principles (E44 EECE 5070, Spring)
- b) Micro-Electro-Mechanical Systems I (E37 MEMS 5801, Fall)
- c) Aerosol Science and Technology (E44 EECE 5040, Fall)
- d) Atmospheric Science and Climate (E44 EECE 5090, Spring)
- e) Advanced Thermodynamics in EECE (E44 EECE 5020, Fall)
- f) Electrochemical Engineering (E44 EECE 5200, Spring)

Group 2: Energy Generation and Conservation (choose 3)

- a) Combustion Phenomena (E44 EECE 5080, Fall)
- b) Solar Thermal Energy Systems (E37 MEMS 5422, Fall)
- c) Thermo-Fluid Modeling of Renewable Energy Systems (E37 MEMS 5424, Fall)
- d) Fundamentals of Solar Energy Thermal Processes (E37 MEMS 5426, Summer)
- e) Sustainable Environmental Building Systems (E37 MEMS 5423, Fall, Spring)
- f) Wind Energy Systems (E37 MEMS 5705, Spring)
- g) Biomass Energy Systems and Engineering (E44 EECE 5180, Fall)
- h) Electro-Bio Carbon Utilization Engineering (E44 EECE 5280, Fall)

Bioengineering and Biotechnology (choose total of 5 courses)

Group 1: Fundamentals (choose 3)

- a) Bioprocess Engineering I: Fundamentals and Applications (E44 EECE 5060, Spring)
- b) Molecular Cell Biology for Engineers (E62 BME 5300, Fall)
- c) Kinetics and Reaction Engineering Principles (E44 EECE 5070, Spring)
- d) Biomass Energy Systems and Engineering (E44 EECE 5180, Fall)
- e) Electro-Bio Carbon Utilization Engineering (E44 EECE 5280, Fall)
- f) Molecular Biochemical Engineering (E44 EECE 5190, Spring)
- g) Biomaterials Science (E62 BME 5230, Fall)

Group 2: Technology and Industry (choose 2)

- a) Biotech Industry Innovators (L41 BIOL 5014, Fall)
- b) Biomedical Product Development (E62 BME 5771, Spring)
- c) Genomics (L41 BIOL 5488, Spring)
- d) Introduction to Biomedical Data Science I (L41 BIOL 5304, Fall)

Energy and Environmental Nanotechnology (choose total of 4 courses)

Group 1: Basics and Fundamentals (choose 2)

- a) Aerosol Science and Technology (E44 EECE 5040, Fall)
- b) Advanced Thermodynamics in EECE (E44 EECE 5020, Fall)
- c) Environmental Nanochemistry (E44 EECE 5140, Spring)
- d) Electrochemical Engineering (E44 EECE 5200, Spring)
- e) Measurement Techniques for Particle Characterization (E44 EECE 5100, Spring)

Group 2: Applications (choose 2)

- a) Micro-Electro-Mechanical Systems I (E37 MEMS 5801, Fall)
- b) Materials Characterization Techniques II (E37 MEMS 5604, Fall)
- c) Nanotechnology Concepts and Applications (E37 MEMS 5803, Summer)

Energy and Environmental Management (choose total of 5 courses)

Group 1: Energy and Environmental Engineering (choose at least 2)

- a) Aerosol Science and Technology (E44 EECE 5040, Fall)
- b) Environmental Organic Chemistry (E44 EECE 5120, Fall)
- c) Interdisciplinary Environmental Clinic (L82 EnSt 5830, Fall, Spring)
- d) Electrochemical Engineering (E44 EECE 5200, Spring)
- e) Environmental Data Science (E44 EECE 5150, Spring)
- f) Environmental Resource Recovery (E44 EECE 5160, Fall)

Group 2: Business/Management-Related Classes (choose at least 2, must total to 6 credits)

- a) Ethical Issues in Managerial Decision Making (B63 MGT 5020, Fall, Spring; 1.5 credit)
- b) Introduction to Entrepreneurship (B63 MGT 5210, Fall, Spring; 3 credit)
- c) Business Planning for New Enterprises [The Hatchery] (B63 MGT 5240, Fall, Spring; 3 credit)
- d) Management and Corporate Responsibility (B63 MGT 529, Fall, Spring, Summer; 1.5 credit)
- e) Negotiation (B66 OB 524, Spring; 3 credit)
- f) Engineering Management & Financial Intelligence (T55 ETEM 5504, Fall, Spring; 3 credit)
- g) Human Performance in the Organization (T55 ETEM 5521, Fall, Spring; 3 credit)

Environmental Engineering Science (choose total of 5 courses)

Group 1: Air and Aerosols (choose at least 1)

- a) Aerosol Science and Technology (E44 EECE 5040, Fall)
- b) Atmospheric Science and Climate (E44 EECE 5090, Spring)
- c) Advanced Thermodynamics in EECE (E44 EECE 5020, Fall)
- d) Measurement Techniques for Particle Characterization (E44 EECE 5100, Spring)

Group 2: Water/Aquatics (choose at least 1)

- a) Environmental Organic Chemistry (E44 EECE 5120, Fall)
- b) Aquatic Chemistry (E44 EECE 5050, Fall)
- c) Physical and Chemical Processes for Water Treatment (E44 EECE 5130, Spring)
- d) Environmental Data Science (E44 EECE 5150, Spring)
- e) Environmental Resource Recovery (E44 EECE 5160, Fall)

Group 3: Policy and Practice (choose 1)

- a) Health Economics and Policy (B64 MEC 5640, Fall)
- b) RESET: Renewable Energy and Decarbonizing the Grid (L82 EnSt 4810, Fall)
- c) Intro to Environmental Law (L82 EnSt 4510, Spring)