

**MS Sustainable Engineering**

*This course plan serves as an example of the program. Program requirements and course offerings are subject to change.*

<p>Fall 2024</p> <ul style="list-style-type: none"> <li>• Core Course (4 units)</li> <li>• Core Course (4 units)</li> </ul>	<p>Spring 2025</p> <ul style="list-style-type: none"> <li>• Core Course (4 units)</li> <li>• Emphasis A, B or C Course (4 units)</li> </ul>
<p>Fall 2025</p> <ul style="list-style-type: none"> <li>• Emphasis A, B or C Course (4 units)</li> <li>• Approved Elective (4 units)</li> </ul>	<p>Spring 2026</p> <ul style="list-style-type: none"> <li>• Approved Electives (4 units)</li> </ul>

**Core Courses (12 units)**

- ENE 527: Climate Change and Atmospheric Aerosols (4 units)
- ISE 576: Industrial Ecology (4 units)
- ENE 505: Energy and the Environment (4 Units)

**Approved Electives (16 units)**

**Emphasis A: Energy and Power Systems Emphasis**

- AME 513a: Fundamentals and Applications of Combustion (4 units)
- AME 513b: Fundamentals and Applications of Combustion (4 units)
- AME 577: Survey of Energy and Power for a Sustainable Future (4 units)
- CHE 510: Energy and Process Efficiency (3 units)
- EE 443: Introduction to Power Systems (4 units)
- EE 444: Power Systems Technology (4 units)
- EE 513: Solid State Energy Devices (4 units)
- EE 521: Power Systems Analysis and Design (4 units)
- EE 526: Renewable Energy in Power Systems (4 units)
- MASC 570: Introduction to Photovoltaic Solar Energy Conversion (4 units)

**Emphasis B: Buildings & Infrastructure Emphasis**

- ARCH 519: Sustainability in the Environment: Infrastructures, Urban Landscapes, and Buildings (3 units)
- CE 430: Sustainable Transportation (2 units)
- CE 469: Sustainable Design and Construction (2 units)
- CE 521: Transportation Systems Analysis (4 units)
- CE 576: Invention and Technology Development (3 units)
- CE 584: Intelligent Transportation Systems (4 units)
- SAE 515: Sustainable Infrastructure Systems (4 units)

### **Emphasis C: Fate of Pollution Emphasis**

- ENE 428: Air Pollution Fundamentals (4 units)
- ENE 440: Machine Learning for Climate Change and Sustainability (4 units)
- ENE 512: Environmental Fluid Mechanics (4 units)
- ENE 535: Applied Air Quality Management (4 units)
- ENE 553: Biological Processes in Environmental Engineering (3 units)
- GEOL 515: Introduction to Atmospheric Science (3 units)

### **Technical Approved Electives**

- CHE 455: Sustainable Materials (4 units)
- MASC 511: Materials Science of Energy Transitions (3 units)
- MASC 564: Composites Processing (4 units)
- PTE 512 Gas Injection Processes — Analytical Solutions and Analysis (3 units)

### **Policy, Economics, Governance, and Innovation Approved Electives**

- CE 579: Introduction to Transportation Planning Law (2 units)
- ENE 502: Environmental and Regulatory Compliance (4 units)
- ISE 501: Innovative Conceptual Design for New Product Development (4 units)
- ISE 545: Technology Development and Implementation (3 units)
- ISE 585: Strategic Management of Technology and Innovation (4 units)
- PPDE 660: Environmental Policy Design and Analysis (4 units)

### **Methods Focused Approved Electives**

- CE 505: Data Management for Civil and Environmental Engineering (2 units)
- CE 531: Quantifying Uncertainty in Civil & Environmental Engineering (2 units)
- CE 532: Data Analytics in Civil Engineering (2 units)
- CE 568: Fundamental Concepts of Computing and Programming in Civil and Environmental Engineering (2 units)
- ISE 529: Predictive Analytics (4 units)
- ISE 535: Data Mining (4 units)
- ISE 562: Decision Analysis (4 units)
- ISE 568: Machine Learning (3 units)
- MASC 515: Basics of Machine Learning for Materials (4 units)
- MASC 520: Mathematical Methods for Deep Learning (4 units)