Focus Area in Mechanical Engineering

**Energy and Environment**

Revised on September 22, 2021

The Energy and Environment (EAE) focus area (FA) provides advanced education in the increasingly important area of energy production, utilization, and its environmental impact, with particular attention to emerging technologies. The FA also provides a solid foundation in transport process modeling and an introduction to environmental engineering. Engineers working in this area must possess not only the fluid dynamics and heat and mass transport modeling abilities typical of mechanical engineers, but also a level of understanding of sustainability of engineered systems.

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course</th>
<th>Session</th>
<th>SH</th>
<th>Pre-/Co-Requisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 (Spring)</td>
<td>Elective</td>
<td></td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>6 (Spring)</td>
<td>Elective</td>
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<td>6 (Spring)</td>
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<td>7 (Fall)</td>
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<td>8 (Spring)</td>
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<tr>
<td>8 (Spring)</td>
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</table>

**Energy & Environment Electives (minimum of 2 required)**

<table>
<thead>
<tr>
<th>Session</th>
<th>SH</th>
<th>Pre-/Co-Requisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>CEE:4107 Sustainable Systems</td>
<td>S</td>
<td>3</td>
</tr>
<tr>
<td>ME:4111 Scientific Computing and Machine Learning</td>
<td>F, S</td>
<td>3</td>
</tr>
<tr>
<td>ME:4160 Engines and Power Plants</td>
<td>S</td>
<td>3</td>
</tr>
<tr>
<td>ME:5145 Intermediate Heat Transfer</td>
<td>F</td>
<td>3</td>
</tr>
<tr>
<td>ME:5149 Propulsion Engineering</td>
<td>F</td>
<td>3</td>
</tr>
<tr>
<td>ME:5160 Intermediate Mechanics of Fluids</td>
<td>F</td>
<td>3</td>
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</table>

**General Electives**

<table>
<thead>
<tr>
<th>Session</th>
<th>SH</th>
<th>Pre-/Co-Requisites</th>
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<tbody>
<tr>
<td>ME:4024 Product Design and Realization</td>
<td>S</td>
<td>3</td>
</tr>
<tr>
<td>ME:4125 Biomimetic Fluid Dynamics</td>
<td>S²</td>
<td>3</td>
</tr>
<tr>
<td>ME:4175 Computational Naval Hydrodynamics</td>
<td>S¹</td>
<td>3</td>
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<tr>
<td>ME:4186 Enhanced Design Experience</td>
<td>S</td>
<td>3</td>
</tr>
<tr>
<td>ME:5143 Computational Fluid and Thermal Engineering</td>
<td>F</td>
<td>3</td>
</tr>
<tr>
<td>ME:5210 Intermediate Thermodynamics</td>
<td>F²</td>
<td>3</td>
</tr>
<tr>
<td>CBE:5405 Green Chemical and Energy Technology</td>
<td>S*</td>
<td>3</td>
</tr>
<tr>
<td>CBE:5415 Satellite Image Processing and Remote Sensing of Atmosphere</td>
<td>S*</td>
<td>3</td>
</tr>
<tr>
<td>CBE:5417 Physical Meteorology and Atmospheric Radiative Transfer</td>
<td>S*</td>
<td>3</td>
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<tr>
<td>CEE:3371 Principles of Hydraulics and Hydrology</td>
<td>S</td>
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<tr>
<td>CEE:4102 Groundwater</td>
<td>F</td>
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<tr>
<td>CEE:4159 Air Pollution Control Technology</td>
<td>S</td>
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<tr>
<td>CEE:5374 Environmental Fluid Mechanics</td>
<td>F</td>
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For further information, please contact: Professor A. Ratner (albert-ratner@uiowa.edu), Department of Mechanical Engineering, University of Iowa, Iowa City, IA 52242.
## Focus Area in Mechanical Engineering

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Semester(s)</th>
<th>Units</th>
<th>Notes</th>
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<tbody>
<tr>
<td>CEE:5380 Fluid Flows in Environmental Systems</td>
<td>F</td>
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<tr>
<td>ECE:5620 Electric Power Systems</td>
<td>S&lt;sup&gt;2&lt;/sup&gt;</td>
<td>3</td>
<td>ENGR:2120, MATH:2560, PHYS:1611</td>
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<tr>
<td>EES:1080 Introduction to Environmental Science</td>
<td>F, S</td>
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<tr>
<td>EES:1290 Energy and the Environment</td>
<td>F</td>
<td>3</td>
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<tr>
<td>ISE:2500 Engineering Economy</td>
<td>S</td>
<td>3</td>
<td>STAT:2020</td>
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</tbody>
</table>

**Flexible Elective** – Choose at most one course from:
1. engineering courses that are required in another (non-ME) program,
2. engineering courses at an upper level (e.g. ME courses numbered 4100 and above),
3. mathematics, physics or chemistry courses at a more advanced level than those required in the ME curriculum,
4. independent investigation in a mechanical engineering subject area, or
5. courses that appear on a list of approved courses found at [https://me.engineering.uiowa.edu/me-elective-focus-areas-efa](https://me.engineering.uiowa.edu/me-elective-focus-areas-efa)

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<sup>1</sup> offered even years only
<sup>2</sup> offered odd years only

*Irregular offerings, check schedule for specific semesters

Substitutions are discouraged and will only be approved under exceptional circumstances requiring the approval of the advisor, FA coordinator and DEO.