The Minor in Energy Engineering

Objective: The goal of this minor is to provide students with a course work experience that will enhance their background, knowledge and skills in the topical area of energy engineering. The minor encompasses courses in several fields of science and engineering, including the Department of Energy, Environmental & Chemical Engineering; the Department of Electrical & Systems Engineering; and the Department of Mechanical Engineering & Materials Science.

A minor in energy engineering requires the completion of 18 units selected from the following lists. It is open to any undergraduate student pursuing an engineering major, a major in the sciences (biology, chemistry, physics) in Arts & Sciences, or the environmental studies major.

Interested departments should expose students to energy and related concepts in their introductory courses.

Basic and Applied Sciences (fundamental content) (two courses):

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>EECE 205</td>
<td>Process Analysis and Thermodynamics (fall)</td>
<td>4 or 3</td>
</tr>
<tr>
<td>or MEMS 301</td>
<td>Therodynamics</td>
<td></td>
</tr>
<tr>
<td>EECE 301</td>
<td>Transport Phenomena I: Basics and Fluid Mechanics (spring)</td>
<td>3</td>
</tr>
<tr>
<td>or MEMS 3410</td>
<td>Fluid Mechanics</td>
<td></td>
</tr>
<tr>
<td>EECE 307</td>
<td>Transport Phenomena II: Energy and Mass Transfer (fall)</td>
<td>3 or 4</td>
</tr>
<tr>
<td>or MEMS 3420</td>
<td>Heat Transfer</td>
<td></td>
</tr>
<tr>
<td>ESE 332</td>
<td>Power, Energy and Polyphase Circuits (spring)</td>
<td>3</td>
</tr>
</tbody>
</table>

* EECE 303 Transport III: Energy Transfer Processes also fulfilled this requirement, but this course is no longer offered.

Social Science/Policy/Economics Elective (students choose one course):

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anthro 3472</td>
<td>Global Energy and the American Dream</td>
<td>3</td>
</tr>
<tr>
<td>EnSt 347</td>
<td>Sustainable Cities</td>
<td>3</td>
</tr>
<tr>
<td>EnSt 350W</td>
<td>Writing Skills for Environmental Professionals (spring)</td>
<td>3</td>
</tr>
<tr>
<td>EnSt 357</td>
<td>Multiparty Environmental Decision Making</td>
<td>3</td>
</tr>
<tr>
<td>EnSt 407</td>
<td>RESET - Renewable Energy Policy, Engineering and Business</td>
<td>3</td>
</tr>
<tr>
<td>EnSt 451</td>
<td>Environmental Policy (fall)</td>
<td>3</td>
</tr>
</tbody>
</table>

Electives:

Students choose three courses. One of the courses is required to be chosen from outside of the student’s major degree department. A partner department may approve the use of a course listed under basic and applied sciences as an elective.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>EECE 311</td>
<td>Green Engineering (fall)</td>
<td>3</td>
</tr>
<tr>
<td>EECE 411</td>
<td>International Experience in EECE (summer/fall)</td>
<td>3</td>
</tr>
<tr>
<td>EECE 512</td>
<td>Combustion Phenomena (fall)</td>
<td>3</td>
</tr>
<tr>
<td>EECE 552</td>
<td>Biomass Energy Systems and Engineering (spring)</td>
<td>3</td>
</tr>
<tr>
<td>ESE 434</td>
<td>Solid-State Power Circuits and Applications (fall)</td>
<td>3</td>
</tr>
<tr>
<td>ESE 435</td>
<td>Electrical Energy Laboratory (spring)</td>
<td>3</td>
</tr>
<tr>
<td>MEMS 412</td>
<td>Design of Thermal Systems (spring)</td>
<td>3</td>
</tr>
<tr>
<td>MEMS 5420</td>
<td>HVAC Analysis and Design I (fall)</td>
<td>3</td>
</tr>
<tr>
<td>MEMS 5421</td>
<td>HVAC Analysis and Design II (spring)</td>
<td>3</td>
</tr>
<tr>
<td>MEMS 5422</td>
<td>Solar Thermal Energy Systems (summer)</td>
<td>3</td>
</tr>
<tr>
<td>MEMS 5423</td>
<td>Sustainable Environmental Building Systems (fall)</td>
<td>3</td>
</tr>
<tr>
<td>MEMS 5424</td>
<td>Thermo-Fluid Modeling of Renewable Energy Systems</td>
<td>3</td>
</tr>
<tr>
<td>MEMS 5705</td>
<td>Wind Energy Systems (spring)</td>
<td>3</td>
</tr>
</tbody>
</table>

Committee to Oversee Energy Engineering Minor

Peng Bai (https://engineering.wustl.edu/faculty/Peng-Bai.html) (EECE, Coordinator); Bruno Sinopoli (https://engineering.wustl.edu/Profiles/Pages/Bruno-Sinopoli.aspx) (ESE); David Peters (https://engineering.wustl.edu/faculty/David-Peters.html) (MEMS)

The committee ensures that any course added to the above lists contains a significant amount of energy topics and that the entire program is cohesive.