**Energy Minor**

Energy touches all aspects of the human experience and is central to nearly every global challenge the world faces today, from raising the standards of living around the world to the existential threat of climate change. The scientific basis of energy is inherently multidisciplinary, and social and behavioral sciences are also crucial to understanding the economics and policy driving technology adoption. The Energy Minor program addresses the growing need for trained engineers and scientists in the many sectors that develop, manage, and propagate these technologies.

The Energy minor is jointly administered by the Department of Earth and Planetary Sciences in the Krieger School of Arts and Sciences and the Department of Electrical and Computer Engineering in the Whiting School of Engineering and is affiliated with the Ralph O’Connor Sustainable Energy Institute (ROSEI, https://energyinstitute.jhu.edu/) which provides additional support and co-curricular opportunities to students in the program. If you have questions regarding the minor, please direct them to Professor Susanna Thon at susanna.thon@jhu.edu.

**Energy Minor Requirements**

The Energy minor is designed to allow students majoring in a diverse set of disciplines to develop additional expertise in energy and to position them to become leaders in the energy field, either directly as entering professionals in industry, government laboratories, and other organizations, or as students in the best graduate programs. It consists of 26-29 credits of energy-related courses in four areas: (a) pre-requisite courses, (b) fundamentals, (c) science and policy context, and (d) technical energy electives. There are two options for completing the fundamentals. Option I is recommended for students completing a major that does not require a thermodynamics course. Option II is recommended for students completing a major that requires a thermodynamics course. Students are encouraged to select electives to fit their particular interests and career goals.

Elective courses that can count toward the minor are those focused on science and policy issues related to energy and relevant technical skills and knowledge areas. The joint KSAS and WSE Directors of Undergraduate Studies (DUS) distribute a list of approved courses for the minor each semester, and these courses are denoted with the POS tags ENGY-SCIPOL and ENGY-TECH in the Schedule of Classes. Approval for other appropriate courses can be sought by emailing one of the DUS’s. All courses must be taken for a letter grade, and students must earn a grade of C- or better to apply the course to the minor.

Consult the Energy minor’s website for additional information: https://energyinstitute.jhu.edu/energy-minor/ (https://energyinstitute.jhu.edu/?page_id=5385&preview=true).

**Sample Programs of Study**

Students majoring in a natural science discipline who do Option I of the fundamentals may follow a curriculum similar to the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First Year</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fall</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AS.110.108</td>
<td>Calculus I (Physical Sciences &amp; Engineering)</td>
<td>4</td>
</tr>
<tr>
<td>AS.171.101</td>
<td>General Physics: Physical Science Major I</td>
<td>4</td>
</tr>
<tr>
<td>AS.171.111</td>
<td>General Physics Laboratory I</td>
<td>1</td>
</tr>
<tr>
<td><strong>Credits</strong></td>
<td></td>
<td>9</td>
</tr>
<tr>
<td><strong>Spring</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AS.171.102</td>
<td>General Physics: Physical Science Major II</td>
<td>4</td>
</tr>
<tr>
<td>AS.173.112</td>
<td>General Physics Laboratory II</td>
<td>1</td>
</tr>
<tr>
<td><strong>Credits</strong></td>
<td></td>
<td>5</td>
</tr>
<tr>
<td><strong>Second Year</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fall</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EN.520.370</td>
<td>Introduction to Renewable Energy Engineering</td>
<td>3</td>
</tr>
<tr>
<td><strong>Credits</strong></td>
<td></td>
<td>3</td>
</tr>
</tbody>
</table>
Students majoring in an engineering field who do Option II of the fundamentals may follow a curriculum similar to the following:

### Course Title Credits

#### First Year

**Fall**
- AS.110.108 Calculus I (Physical Sciences & Engineering) 4
- AS.171.101 General Physics: Physical Science Major I 4
- AS.173.111 General Physics Laboratory I 1
  
  **Credits** 9

**Second Year**
- EN.520.370 Introduction to Renewable Energy Engineering 3
  
  **Credits** 3

**Spring**
- EN.510.312 Thermodynamics/Materials 3
  
  **Credits** 3

#### Third Year

**Fall**
- Policy elective (ENGY-SCIPOL) 3
  
  **Credits** 3

**Spring**
- Technical elective (ENGY-TECH) 3
  
  **Credits** 3

#### Fourth Year

**Fall**
- Policy elective (ENGY-SCIPOL) 3
  
  **Credits** 3

**Spring**
- Technical elective (ENGY-TECH) 3
  
  **Credits** 3

**Total Credits** 29