MINOR IN ENERGY STUDIES

Energy is a fundamentally multidisciplinary topic. Transforming the world's energy systems requires combining expertise from numerous fields in engineering and technology, natural and social science, and policy. A diversity of disciplinary perspectives is necessary to equip students to work in this complex, evolving field.

The Energy Studies Minor for undergraduates is an Institute-wide program that complements the deep expertise obtained in any major with a broad understanding of the interlinked realms of science, technology, and social sciences as they relate to energy and associated environmental challenges. The minor curriculum integrates these three domains in a thoroughly multidisciplinary program. The Energy Minor Oversight Committee, including faculty representatives from all five Schools, oversees the Energy Studies Minor program.

The Energy Studies curriculum has two components. The first is a core that provides an integrated perspective on energy and associated environmental challenges in three domains, each with a primary focus: Science Foundations (fundamental laws and principles that govern energy sources, conversion, and uses), Social Science Foundations (social scientific perspectives and tools that explain human behavior in the energy context), and Technology/Engineering in Context (the application of laws and principles to a specific energy context). The second component is a customized program of electives that is selected by each student in close consultation with his or her Energy Studies Minor faculty advisor.

Core Curriculum

**Science Foundations** 12-27

Option 1

8.21 Physics of Energy

Option 2 - Select two subjects from one of the following groups:

Group A

6.007 Electromagnetic Energy: From Motors to Solar Cells

2.005 Thermal-Fluids Engineering I

or 3.012 Fundamentals of Materials Science and Engineering

Group B

5.60 Thermodynamics and Kinetics

12.021 Earth Science, Energy, and the Environment

or 12.340 Global Warming Science

**Social Science Foundations** 33-36

14.01 Principles of Microeconomics

or 15.011 Economic Analysis for Business Decisions

Select one of the following options:


or 15.031[J] Energy Decisions, Markets, and Policies

Option 2 - Select one subject from each of the following groups:

**Group A**

14.42 Environmental Policy and Economics


**Group B**

1.801[J] Environmental Law, Policy, and Economics: Pollution Prevention and Control

11.162 Politics of Energy and the Environment

22.04[J] Social Problems of Nuclear Energy

**Technology/Engineering in Context** 12

Select one of the following:

2.60[J] Fundamentals of Advanced Energy Conversion


22.081[J] Introduction to Sustainable Energy

**Electives** 24

Select 24 units from the following:

1.071[J] Global Change Science

2.006 Thermal-Fluids Engineering II

2.612 Marine Power and Propulsion

2.627 Fundamentals of Photovoltaics

2.813 Energy, Materials, and Manufacturing

3.003 Principles of Engineering Practice (9 units)

3.004 Principles of Engineering Practice

3.18 Materials Science and Engineering of Clean Energy

4.401 Environmental Technologies in Buildings

6.131 Power Electronics Laboratory

6.701 Introduction to Nanoelectronics

8.044 Statistical Physics I

10.04 A Philosophical History of Energy

10.213 Chemical and Biological Engineering Thermodynamics

10.27 Energy Engineering Projects Laboratory (15 units)

10.28 Chemical-Biological Engineering Laboratory (15 units)
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.426</td>
<td>Electrochemical Energy Systems</td>
<td>15</td>
</tr>
<tr>
<td>11.142</td>
<td>Geography of the Global Economy</td>
<td></td>
</tr>
<tr>
<td>11.165</td>
<td>Urban Energy Systems and Policy</td>
<td></td>
</tr>
<tr>
<td>12.213</td>
<td>Alternate Energy Sources</td>
<td>6</td>
</tr>
<tr>
<td>17.051</td>
<td>Ethics of Energy Policy</td>
<td></td>
</tr>
<tr>
<td>22.033</td>
<td>Nuclear Systems Design Project</td>
<td></td>
</tr>
<tr>
<td>22.06</td>
<td>Engineering of Nuclear Systems</td>
<td></td>
</tr>
<tr>
<td>EC.711[J]</td>
<td>D-Lab: Energy</td>
<td></td>
</tr>
<tr>
<td>STS.032</td>
<td>Energy, Environment, and Society</td>
<td></td>
</tr>
</tbody>
</table>

Total Units 81-99

2 See the Energy Studies Minor website (http://energy.mit.edu/minor) for potential elective and core subject substitutions or additions.

2 All subjects are 12-unit subjects unless otherwise noted.

Students who take more than the required subjects from any of the core curriculum subject lists may count the additional coursework toward the elective requirement. Contact Rachel Shulman (rshulman@mit.edu), academic coordinator, MIT Energy Initiative Education Office, Room E19-370D, 617-324-7236, or visit the Energy Studies Minor website (http://energy.mit.edu/minor) for more information.