The Energy Studies Minor complements the deep expertise obtained in any MIT major with broad, interdisciplinary training in science, technology, and the social sciences, including policy issues surrounding energy and climate change.

Students take classes in four core areas, plus 24 units of electives. The core consists of:

- Science Foundations: fundamental laws and principles that govern energy sources, conversion, and uses;
- Economics Foundations: how economic principles underlie every aspect of energy;
- Social Science Foundations: social scientific perspectives that help explain human behavior in an energy context, and;
- Energy Technology/Engineering in Context: the application of laws and principles to a specific energy context.

The elective component (generally two classes) allows students to focus on their individual areas of interest.

Developed and administered by the MIT Energy Initiative, the Energy Studies Minor sets students on the path to tackle the world’s complex climate and energy challenges. Through the minor, students build strong foundational knowledge of diverse energy topics while benefiting from hands-on learning opportunities to work with world-renowned researchers, policy analysts, and thought leaders. Students also make groundbreaking discoveries and prepare for exciting careers in industry, government, and academia.

### Core Curriculum

<table>
<thead>
<tr>
<th>Science Foundations</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>8.21 Physics of Energy</td>
<td>12</td>
</tr>
<tr>
<td>or 12.021 Earth Science, Energy, and the Environment</td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Economics Foundations</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>14.01 Principles of Microeconomics</td>
<td>9-12</td>
</tr>
<tr>
<td>or 15.011 Economic Analysis for Business Decisions</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Social Science Foundations</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Select one of the following:</td>
<td>12</td>
</tr>
<tr>
<td>11.142 Geography of the Global Economy</td>
<td></td>
</tr>
<tr>
<td>15.0201[J] Economics of Energy, Innovation, and Sustainability</td>
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</table>

<table>
<thead>
<tr>
<th>Energy Technology/Engineering in Context</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Select one of the following:</td>
<td>12</td>
</tr>
<tr>
<td>2.60[J] Fundamentals of Advanced Energy Conversion</td>
<td></td>
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<tr>
<td>11.165 Urban Energy Systems and Policy</td>
<td></td>
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</table>

### Electives

Select 24 units from the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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</thead>
<tbody>
<tr>
<td>22.081[J]</td>
<td>Introduction to Sustainable Energy</td>
</tr>
<tr>
<td>EC.711[J]</td>
<td>Introduction to Energy in Global Development</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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</thead>
<tbody>
<tr>
<td>1.018[J]</td>
<td>Fundamentals of Ecology</td>
</tr>
<tr>
<td>1.020</td>
<td>Engineering Sustainability: Analysis and Design 1</td>
</tr>
<tr>
<td>1.071[J]</td>
<td>Global Change Science 1</td>
</tr>
<tr>
<td>1.079</td>
<td>Rock-on-a-Chip: Microfluidic Technology for Visualization of Flow in Porous Media 1</td>
</tr>
<tr>
<td>1.801[J]</td>
<td>Environmental Law, Policy, and Economics: Pollution Prevention and Control</td>
</tr>
<tr>
<td>2.005</td>
<td>Thermal-Fluids Engineering I 1</td>
</tr>
<tr>
<td>2.006</td>
<td>Thermal-Fluids Engineering II 1</td>
</tr>
<tr>
<td>2.570</td>
<td>Nano-to-Macro Transport Processes 1</td>
</tr>
<tr>
<td>2.603</td>
<td>Fundamentals of Smart and Resilient Grids 1</td>
</tr>
<tr>
<td>2.612</td>
<td>Marine Power and Propulsion 1</td>
</tr>
<tr>
<td>2.627</td>
<td>Fundamentals of Photovoltaics</td>
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<tr>
<td>2.813</td>
<td>Energy, Materials, and Manufacturing 1</td>
</tr>
<tr>
<td>3.003</td>
<td>Principles of Engineering Practice</td>
</tr>
<tr>
<td>or 3.004</td>
<td>Principles of Engineering Practice</td>
</tr>
<tr>
<td>3.012</td>
<td>Fundamentals of Materials Science and Engineering</td>
</tr>
<tr>
<td>3.022</td>
<td>Microstructural Evolution in Materials</td>
</tr>
<tr>
<td>3.154[J]</td>
<td>Materials Performance in Extreme Environments 1</td>
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<tr>
<td>3.18</td>
<td>Materials Science and Engineering of Clean Energy 1</td>
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<tr>
<td>4.401</td>
<td>Environmental Technologies in Buildings</td>
</tr>
<tr>
<td>4.432</td>
<td>Modeling Urban Energy Flows for Sustainable Cities and Neighborhoods</td>
</tr>
<tr>
<td>5.352</td>
<td>Synthesis of Coordination Compounds and Kinetics 1</td>
</tr>
<tr>
<td>5.372</td>
<td>Chemistry of Renewable Energy 1</td>
</tr>
<tr>
<td>5.60</td>
<td>Thermodynamics and Kinetics</td>
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<tr>
<td>6.061</td>
<td>Introduction to Electric Power Systems 1</td>
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<td>6.131</td>
<td>Power Electronics Laboratory 1</td>
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<td>6.701</td>
<td>Introduction to Nanoelectronics 1</td>
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<tr>
<td>10.04</td>
<td>A Philosophical History of Energy</td>
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### MINOR IN ENERGY STUDIES

<table>
<thead>
<tr>
<th>Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>10.05</td>
<td>Foundational Analyses of Problems in Energy and the Environment</td>
</tr>
<tr>
<td>10.213</td>
<td>Chemical and Biological Engineering Thermodynamics ¹</td>
</tr>
<tr>
<td>10.27</td>
<td>Energy Engineering Projects Laboratory ¹</td>
</tr>
<tr>
<td>10.28</td>
<td>Chemical-Biological Engineering Laboratory ¹</td>
</tr>
<tr>
<td>10.302</td>
<td>Transport Processes ¹</td>
</tr>
<tr>
<td>10.426</td>
<td>Electrochemical Energy Systems ¹</td>
</tr>
<tr>
<td>11.162</td>
<td>Politics of Energy and the Environment</td>
</tr>
<tr>
<td>12.213</td>
<td>Alternate Energy Sources</td>
</tr>
<tr>
<td>12.346[J]</td>
<td>Global Environmental Negotiations</td>
</tr>
<tr>
<td>14.42</td>
<td>Environmental Policy and Economics</td>
</tr>
<tr>
<td>16.001</td>
<td>Unified Engineering: Materials and Structures ¹</td>
</tr>
<tr>
<td>16.002</td>
<td>Unified Engineering: Signals and Systems ¹</td>
</tr>
<tr>
<td>16.003</td>
<td>Unified Engineering: Fluid Dynamics ¹</td>
</tr>
<tr>
<td>16.004</td>
<td>Unified Engineering: Thermodynamics ¹</td>
</tr>
<tr>
<td>17.051</td>
<td>Ethics of Energy Policy</td>
</tr>
<tr>
<td>22.033</td>
<td>Nuclear Systems Design Project</td>
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<tr>
<td>22.044[J]</td>
<td>Social Problems of Nuclear Energy</td>
</tr>
<tr>
<td>22.054[J]</td>
<td>Materials Performance in Extreme Environments</td>
</tr>
<tr>
<td>22.06</td>
<td>Engineering of Nuclear Systems ¹</td>
</tr>
<tr>
<td>STS.032</td>
<td>Energy, Environment, and Society</td>
</tr>
</tbody>
</table>

**Total Units** 69-72

¹ Subject has prerequisites that are outside of the program.
2 See the Energy Studies Minor website (http://energy.mit.edu/minor) for potential elective and core subject substitutions or additions.

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. A minimum of three subjects (or 36 units) taken for the Energy Studies Minor cannot also count toward a student’s major or other minor.

Contact Rachel Shulman (rshulman@mit.edu), academic coordinator, MIT Energy Initiative Education Office, Room E19-306C, 617-324-7236, or visit the Energy Studies Minor website (http://energy.mit.edu/minor) for more information.