MINOR IN ENERGY STUDIES

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

**Science Foundations**

8.21 Physics of Energy 12
or 12.021 Earth Science, Energy, and the Environment

**Economics Foundations**

14.01 Principles of Microeconomics 9-12
or 15.011 Economic Analysis for Business Decisions

**Social Science Foundations**

Select one of the following: 12

- 11.142 Geography of the Global Economy
- 11.165 Urban Energy Systems and Policy 2

**Energy Technology/Engineering in Context**

Select one of the following: 12

- 11.165 Urban Energy Systems and Policy 2
- 22.081[J] Introduction to Sustainable Energy
- EC.711[J] Introduction to Energy in Global Development
- EC.712[J] Applications of Energy in Global Development

**Electives**

Select 24 units from the following: 3 24

- 1.018[J] Fundamentals of Ecology
- 1.020 Engineering Sustainability: Analysis and Design 1
- 1.071[J] Global Change Science 1
- 1.079 Rock-on-a-Chip: Microfluidic Technology for Visualization of Flow in Porous Media 1
- 1.801[J] Environmental Law, Policy, and Economics: Pollution Prevention and Control
- 1.C01 Machine Learning for Sustainable Systems
- 2.005 Thermal-Fluids Engineering I 1
- 2.006 Thermal-Fluids Engineering II 1
- 2.570 Nano-to-Macro Transport Processes 1
- 2.603 Fundamentals of Smart and Resilient Grids 1
- 2.612 Marine Power and Propulsion 1
- 2.627 Fundamentals of Photovoltaics
- 2.813 Energy, Materials, and Manufacturing 1
- 3.003 Principles of Engineering Practice
  or 3.004 Principles of Engineering Practice
- 3.010 Structure of Materials 1
- 3.020 Thermodynamics of Materials 1
- 3.030 Microstructural Evolution in Materials
- 3.154[J] Materials Performance in Extreme Environments 1
- 3.18 Materials Science and Engineering of Clean Energy 1
- 4.401 Environmental Technologies in Buildings
- 4.432 Modeling Urban Energy Flows for Sustainable Cities and Neighborhoods
- 5.352 Synthesis of Coordination Compounds and Kinetics 1
- 5.372 Chemistry of Renewable Energy 1
- 5.60 Thermodynamics and Kinetics
6.2200 Introduction to Electric Power Systems
6.2220 Power Electronics Laboratory ¹
6.2530 Introduction to Nanoelectronics ²
10.04 A Philosophical History of Energy
10.05 Foundational Analyses of Problems in Energy and the Environment
10.213 Chemical and Biological Engineering Thermodynamics ³
10.27 Energy Engineering Projects Laboratory ¹
10.28 Chemical-Biological Engineering Laboratory ¹
10.302 Transport Processes ¹
10.426 Electrochemical Energy Systems ¹
11.149 Decarbonizing Urban Mobility
11.162 Politics of Energy and the Environment
12.119 Harnessing Power from Environmental Microbes and Chemical Gradients
12.213 Alternate Energy Sources
12.346[J] Global Environmental Negotiations
14.42 Environmental Policy and Economics
16.001 Unified Engineering: Materials and Structures ¹
16.002 Unified Engineering: Signals and Systems ¹
16.003 Unified Engineering: Fluid Dynamics ¹
16.004 Unified Engineering: Thermodynamics and Propulsion ¹
22.033 Nuclear Systems Design Project
22.04[J] Social Problems of Nuclear Energy
22.054[J] Materials Performance in Extreme Environments ¹
22.06 Engineering of Nuclear Systems ¹
22.061 Fusion Energy ¹
22.071 Analog Electronics From Circuits to the Zero-Carbon Grid
IDS.064 Engineering, Economics and Regulation of the Electric Power Sector
STS.032 Energy, Environment, and Society

Total Units 69-72

¹ Subject has prerequisites that are outside of the program.
² Subject can fulfill either the Social Science Foundations requirement or the Energy Technology/Engineering in Context requirement, but not both.
³ 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.