

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

Select one of the following: 12

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

Economics Foundations

Select one of the following: 9-12

14.01	Principles of Microeconomics
15.0111	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
14.44[[]]	Energy Economics and Policy
15.0201[[]]	Economics of Energy, Innovation, and Sustainability
15.2191[[]]	Global Energy: Politics, Markets, and Policy

Energy Technology/Engineering in Context

Select one of the following: 12

2.60[[]]	Fundamentals of Advanced Energy Conversion ¹
11.165	Urban Energy Systems and Policy ²
22.081[[]]	Introduction to Sustainable Energy
EC.711[[]]	Introduction to Energy in Global Development
EC.712[[]]	Applications of Energy in Global Development

Electives

Select 24 units from the following: ³ 24

1.018[[]]	Fundamentals of Ecology
1.020	Engineering Sustainability: Analysis and Design ¹
1.071[[]]	Global Change Science ¹
1.801[[]]	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
2.612	Marine Power and Propulsion ¹
2.627	Fundamentals of Photovoltaics
2.813	Energy, Materials, and Manufacturing ¹
3.003 or 3.004	Principles of Engineering Practice Principles of Engineering Practice
3.010	Structure of Materials ¹
3.020	Thermodynamics of Materials ¹
3.030	Microstructural Evolution in Materials
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
5.601	Thermodynamics I
5.602	Thermodynamics II and Kinetics
5.811[[]]	United States Energy Policy: Lessons Learned for the Future
6.2200	Electric Energy Systems ¹

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6.2220	Power Electronics Laboratory ¹
6.2530	Introduction to Nanoelectronics ¹
6.2600[J]	Micro/Nano Processing Technology
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 ¹
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
15.026[J]	Global Climate Change: Economics, Science, and Policy
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 and Analog Instrumentation Design
IDS.064	Engineering, Economics and Regulation of the Electric Power Sector
IDS.065[J]	Energy Systems for Climate Change Mitigation
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 Rowan Elowe (rowane@mit.edu), Education Program Manager, MIT Energy Initiative Education Office, Room E19-432K, 617-324-1967, or visit the Energy Studies Minor website (<http://energy.mit.edu/minor>) for more information.