MINOR IN ENVIRONMENT AND SUSTAINABILITY

The Environment and Sustainability Minor (E&S Minor) provides an integrative foundation in the scientific, engineering, social, and humanistic dimensions of humanity's interaction with the environment. The minor will equip students with knowledge and experience that will make it possible to understand, diagnose, and develop solutions to complex problems faced by society as it strives for social and environmental sustainability. Students who complete the minor will be prepared to apply the principles of sustainability in diverse workplace contexts, including business/industry, government, civil society, and academia.

The E&S Minor combines a wide range of fields of inquiry to directly engage environmental and climate challenges facing ecosystems and populations around the globe. Fundamentally, these challenges affect both human systems and the earth systems on which we depend: people and the planet. Planetary challenges include global changes in the climate and oceans, degradation to both biodiversity and material resources, and fundamental transformations of biogeochemical cycles. Challenges facing society include (but are not limited to) widespread and intransigent environmental injustice, expanding urban and agricultural pollution, technological and economic lock-in of infrastructure and all manner of production and consumption systems, and a global dependence on carbon intensive energy.

The minor prioritizes integrative, interdisciplinary learning that is critical for effectively understanding and addressing the complexities of environmental issues today and in the future, and is structured on four pillars: Earth Systems and Climate Science, Environmental Governance, Environmental Histories and Cultures, and Engineering for Sustainability.

The E&S Minor is comprised of five subjects (a minimum of 57 units). Students take two core subjects that address the fundamentals of each pillar, and select a minimum of 36 units of elective subjects to craft a program that reflects their own particular interests. In consultation with the minor advisor, students may either concentrate in one of the four pillars or explore various areas by selecting classes from multiple pillars.

**Minor Requirements**

**Core Curriculum**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
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<tbody>
<tr>
<td>12.387[J]</td>
<td>People and the Planet: Environmental Governance and Science</td>
<td>9</td>
</tr>
<tr>
<td>11.004[J]</td>
<td>People and the Planet: Environmental Histories and Engineering</td>
<td>12</td>
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**Electives**

In consultation with the minor advisor, select a minimum of 36 units from the list of electives. Total Units: 57-60

**Earth Systems and Climate Science**

- 1.018[J]: Fundamentals of Ecology: 12 units
- 1.078: Soil and Environmental Biogeochemistry: 12 units
- 1.080: Environmental Chemistry: 12 units
- 1.089: Earth’s Microbiomes: 12 units
- 2.981: New England Coastal Ecology: 3 units
- 3.982: The Ancient Andean World: 9 units
- 8.21: Physics of Energy: 12 units
- 12.000: Solving Complex Problems: 9 units
- 12.001: Introduction to Geology: 12 units
- 12.002: Introduction to Geophysics and Planetary Science: 12 units
- 12.003: Introduction to Atmosphere, Ocean, and Climate Dynamics: 12 units
- 12.007: Geobiology: History of Life on Earth: 12 units
- 12.021: Earth Science, Energy, and the Environment: 12 units
- 12.104: Geochemistry of Natural Waters: 12 units
- 12.170: Essentials of Geology: 12 units
- 12.174: Biogeochemistry of Natural and Perturbed Systems: 12 units
- 12.307: Weather and Climate Laboratory: 12 units
- 12.335: Experimental Atmospheric Chemistry: 12 units
- 12.349: Mechanisms and Models of the Global Carbon Cycle: 12 units
- 12.385: Science, Politics, and Environmental Policy: 9 units
- 20.106[J]: Applied Microbiology: 12 units

**Environmental Governance**

- 1.801[J]: Environmental Law, Policy, and Economics: Pollution Prevention and Control: 12 units
- 1.802[J]: Regulation of Chemicals, Radiation, and Biotechnology: 12 units
- 11.123: Big Plans and Mega-Urban Landscapes: 9 units
- 11.142: Geography of the Global Economy: 12 units
- 11.148: Environmental Justice: Law and Policy: 12 units
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11.169  Global Climate Policy and Sustainability  
12.385  Science, Politics, and Environmental Policy  
17.181  Sustainability: Political Economy, Science, and Policy  
17.309[1][J]  Science, Technology, and Public Policy  
17.411  Globalization, Migration, and International Relations  
21A.410  Environmental Struggles  
EC.701[J]  D-Lab: Development  
EC.711[J]  Introduction to Energy in Global Development  
EC.715  D-Lab: Water, Sanitation and Hygiene  
EC.716  D-Lab: Waste  
IDS.062[J]  Global Environmental Negotiations  
Environmental Histories and Cultures  
1.016[J]  Design for Complex Environmental Issues: Building Solutions and Communicating Ideas  
3.094  Materials in Human Experience  
3.982  The Ancient Andean World  
3.983  Ancient Mesoamerican Civilization  
4.622  Islamic Gardens and Geographies  
10.04  A Philosophical History of Energy  
10.05  Foundational Analyses of Problems in Energy and the Environment  
11.016[J]  The Once and Future City  
17.051  Ethics of Energy Policy  
24.03  Good Food: The Ethics and Politics of Food  
21A.155  Food, Culture, and Politics  
21A.303[J]  The Anthropology of Biology  
21G.417  Cultural Geographies of Germany: Nature, Culture, and Politics  
21H.185[J]  Environment and History  
21H.380[J]  People and Other Animals  
21H.383  Technology and the Global Economy, 1000-2000  
21L.449  The Wilds of Literature  
21W.012  Writing and Rhetoric: Food for Thought  
21W.036  Science Writing and New Media: Writing and the Environment  
21W.775  Writing about Nature and Environmental Issues  
EC.701[J]  D-Lab: Development  
EC.715  D-Lab: Water, Sanitation and Hygiene  
SP.360  Terrascope Radio  
STS.009  Evolution and Society  
STS.032  Energy, Environment, and Society  
Engineering for Sustainability  
1.007  Big Engineering: Small Solutions with a Large Impact  
1.016[J]  Design for Complex Environmental Issues: Building Solutions and Communicating Ideas  
2.00A  Fundamentals of Engineering Design: Explore Space, Sea and Earth  
2.627  Fundamentals of Photovoltaics  
3.094  Materials in Human Experience  
3.983  Ancient Mesoamerican Civilization  
4.401  Environmental Technologies in Buildings  
4.411[J]  D-Lab Schools: Building Technology Laboratory  
4.432  Modeling Urban Energy Flows for Sustainable Cities and Neighborhoods  
12.000  Solving Complex Problems  
12.213  Alternate Energy Sources  
22.033  Nuclear Systems Design Project  
22.04[J]  Social Problems of Nuclear Energy  
22.081[J]  Introduction to Sustainable Energy  
EC.701[J]  D-Lab: Development  
EC.711[J]  Introduction to Energy in Global Development  
EC.715  D-Lab: Water, Sanitation and Hygiene  
EC.716  D-Lab: Waste  
EC.719  D-Lab: Water, Climate Change, and Health  
EC.724  D-Lab: Smallholder Agriculture  
EC.733[J]  D-Lab: Supply Chains  

2  Subject also counts toward Environmental Histories and Cultures.  
3  Subject also counts toward Engineering for Sustainability.  
4  Subject also counts toward Earth Systems and Climate Science.
A minimum of four subjects (or 48 units) taken for the Environment and Sustainability minor cannot also count toward a student's major or other minor.

For more information about the minor and about potential subject substitutions, contact Sarah Meyers (smeyers@mit.edu), Education Program Manager, MIT Environmental Solutions Initiative (ESI), Room E70-1201, 617-715-2606, or visit the ESI’s education website (https://environmentalsolutions.mit.edu/environment-sustainability-minor).