MINOR IN ENVIRONMENT AND SUSTAINABILITY

Open to all MIT undergraduates in any major, the Environment and Sustainability Minor (E&S Minor) offers students the opportunity to apply their STEM and major-course knowledge to some of the most critical and challenging problems facing humanity. The minor equips students with interdisciplinary knowledge and real-world experience needed to understand, diagnose, and develop solutions to complex problems faced by society as it strives for social and environmental sustainability. Students tailor their MIT education to their professional goals, preparing 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. Planetary challenges include climate change, risks to oceans and forests, degradation to both biodiversity and material resources, and fundamental transformations of biogeochemical cycles. Challenges facing society include 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. Upon completion of the minor, students will have achieved learning outcomes in seven categories: Systems Thinking; Sustainable Design Skills; Applied Sustainable Solutions; Know Your Planet; Social Context; Ethical Decision-making; and Impactful Communication.

The E&S Minor is comprised of five to six subjects, for a minimum of 57 units:

- One foundational subject (12.387[J] People and the Planet: Environmental Governance and Science)
- Subjects in two core required areas of study: 1) Context and Perspective and 2) Sustainable Solutions
- 24 units of elective subjects, reflecting the student's particular interests.

Environment and Sustainability Foundation		
12.387[J]	People and the Planet: Environmental Governance and Science	9
Context and Perspective		
Select one of the following: [1,2,3]		12
11.169	Global Climate Policy and Sustainability	
21A.312	Planetary Change and Human Health	
21A.410	Environmental Struggles	
21H.185[J]	Environment and History	
21H.186	Nature and Environment in China	
21H.187	US Environmental Governance: from National Parks to the Green New Deal	
Sustainable Solutions		
Select one of the following: [1,2,3]		12
1.006	Tools for Sustainable Design	
2.722[J]	D-Lab: Design	
11.025[J]	D-Lab: Development	
EC.715	D-Lab: Water, Sanitation and Hygiene	
EC.719	D-Lab: Water, Climate Change, and Health	
Electives		
Select a minimum of 24 units from the categories below: [1,2,3]		24
Discovery		
1.008	Engineering for a Sustainable World	
1.009	Climate Change	
1.091	Traveling Research Environmental eXperience (TREX): Fieldwork	
2.00C[J]	Design for Complex Environmental Issues [4]	
2.981	New England Coastal Ecology	
3.002	Materials for Energy and Sustainability	
12.000	Solving Complex Problems [4]	
12.12	Nature's Sandbox: The History of Ancient Environments, Climate, and Life	
SP.310	Engagement and Discovery Through the Terrascope Field Experience [4]	
SP.360	Terrascope Radio [4]	
SP.361	Majors and Careers Through a Terrascope Lens [4]	
Applied Problem Solving		
1.004	Startup Sustainable Tech	
1.013	Senior Civil and Environmental Engineering Design	
1.020	Engineering Sustainability: Analysis and Design	
1.102	Introduction to Civil and Environmental Engineering Design II	
1.107	Environmental Chemistry Laboratory	

2.00A	Designing for the Future: Earth, Sea, and Space
2.651[J]	Introduction to Energy in Global Development
4.218	Disaster Resilient Design
4.411[J]	D-Lab Schools: Building Technology Laboratory
10.496[J]	Design of Sustainable Polymer Systems
11.007	Urban and Environmental Technology Implementation Lab
11.173[J]	Infrastructure Design for Climate Change
12.307	Weather and Climate Laboratory
12.335	Experimental Atmospheric Chemistry
15.772[J]	D-Lab: Supply Chains
22.033	Nuclear Systems Design Project
Economic and Global Systems	
14.42	Environmental Policy and Economics
14.43[J]	Economics of Energy, Innovation, and Sustainability
14.44[J]	Energy Economics and Policy
15.8731	System Dynamics: Tools for Solving Complex Problems
21H.383	Technology and the Global Economy, 1000-2000
IDS.437[J]	Technology, Globalization, and Sustainable Development
Energy x Sustainability	
3.18	Materials Science and Engineering of Clean Energy
5.371	Continuous Flow Chemistry: Sustainable Conversion of Reclaimed Vegetable Oil into Biodiesel
8.21	Physics of Energy
10.04	A Philosophical History of Energy
10.05	Foundational Analyses of Problems in Energy and the Environment
10.390[J]	Fundamentals of Advanced Energy Conversion
22.081[J]	Introduction to Sustainable Energy
IDS.521[J]	Energy Systems for Climate Change Mitigation
Ethics and Just Futures	
6.9320	Ethics for Engineers
11.148	Environmental Justice: Law and Policy
21A.155	Food, Culture, and Politics
22.04[J]	Social Problems of Nuclear Energy
24.03	Good Food: The Ethics and Politics of Food
24.07	
24.191	Being, Thinking, Doing (or Not): Ethics in Your Life
STS.032	Energy, Environment, and Society
WGS.160[J]	Science Activism: Gender, Race, and Power
WGS.275[J]	Gender, Race, and Environmental Justice
Life and Ecology	
1.089	Earth's Microbiomes
7.30[J]	Fundamentals of Ecology
12.007	Geobiology: History of Life on Earth
21A.303[J]	The Anthropology of Biology
Materials and Material Culture	
1.035	Mechanics of Materials
3.081	Industrial Ecology of Materials
3.094	Materials in Human Experience
3.19	Sustainable Chemical Metallurgy
3.982	The Ancient Andean World
3.983	Ancient Mesoamerican Civilization
4.657	Design: The History of Making Things
Media, Communications, and Literature	
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
CMS.374[J]	Transmedia Art, Extraction, and Environmental Justice
CMS.375	Reading Climate Through Media
STS.034	Science Communication: A Practical Guide
Negotiations, Politics, and Policy	
11.003[J]	Methods of Policy Analysis
11.011	The Art and Science of Negotiation
12.385	Science, Politics, and Environmental Policy
17.181	Sustainability: Political Economy, Science, and Policy
17.30[J]	Making Public Policy
17.309[J]	Science, Technology, and Public Policy

IDS.060[J]	Environmental Law, Policy, and Economics: Pollution Prevention and Control
IDS.061[J]	Regulation of Chemicals, Radiation, and Biotechnology
IDS.062[J]	Global Environmental Negotiations
Planet Earth and Climate Science	
1.061	Transport Processes in the Environment
1.061A	Transport Processes in the Environment I
1.071[J]	Global Change Science
1.080	Environmental Chemistry
1.085[J]	Air Pollution and Atmospheric Chemistry
12.001	Introduction to Geology
12.002	Introduction to Geophysics and Planetary Science
12.003	Introduction to Atmosphere, Ocean, and Climate Dynamics
12.021	Earth Science, Energy, and the Environment
12.086	Modeling Environmental Complexity
12.104	Geochemistry of Natural Waters
12.301	Climate Science
12.306	Atmospheric Physics and Chemistry
12.349	Mechanisms and Models of the Global Carbon Cycle
12.372	Elements of Modern Oceanography
12.377	The History of Earth's Climate
12.390	Fluid Dynamics of the Atmosphere and Ocean
18.352[J]	Nonlinear Dynamics: The Natural Environment
The Built Environment	
4.211[J]	The Once and Future City
4.401	Environmental Technologies in Buildings
4.432	Modeling Urban Energy Flows for Sustainable Cities and Neighborhoods
11.113	The Economic Approach to Cities and Environmental Sustainability
11.123	Big Plans and Mega-Urban Landscapes
11.149	Decarbonizing Urban Mobility
11.158	Behavioral Science, AI, and Urban Mobility
11.165	Urban Energy Systems and Policy
Total Units	**57**

1 *See the Environment & Sustainability Minor website (https://environmentalsolutions.mit.edu/environment-sustainability-minor) for potential elective and core subject substitutions or additions.*

2 *Not all subjects in the E&S Minor are offered every academic year, and some have prerequisites that are outside of the E&S Minor program. Please visit the MIT Subject Listing (http://student.mit.edu/catalog) for a current and comprehensive list of offered classes.*

3 *If a subject is counted towards a core area of study, it cannot also count as an elective.*

4 *Up to two Terrascope (https://terrascope.mit.edu) subjects may count towards the E&S Minor.*

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. In other words, only one subject that counts toward a student's major or other minor degree may also count toward the E&S Minor elective requirement.

There are no restrictions on the number of subjects that may count towards a student's HASS Concentration and the E&S Minor. A student may petition to have a subject that is not listed on the electives listing count towards the E&S Minor.

For more information, contact Sarah Meyers (*smeyers@mit.edu*), Education Program Manager at the MIT Environmental Solutions Initiative (ESI) or visit the ESI education website (*https://environmentalsolutions.mit.edu/environment-sustainability-minor*).