

EAPS

COURSE 12 | EARTH, ATMOSPHERIC AND PLANETARY SCIENCES

CONTACT

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DESCRIPTION

Departmental programs apply physics, chemistry, and mathematics to the study of the Earth and planets in order to understand the processes that are active in the Earth's interior, oceans, and atmosphere, as well as the interiors and atmospheres of other planets. The department also uses the basic sciences to understand the past history of the Earth and planets. Students work to develop an understanding of the dynamics of systems as diverse as the global climate system, regional tectonics and deformation, petroleum and geothermal reservoirs, and the solar system.

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12 Earth, Atmospheric, and Planetary Sciences

INTRODUCTORY CLASSES

12.001 **Introduction to Geology**

Major minerals and rock types, rock-forming processes, and time scales. Temperatures, pressures, compositions, structure of the Earth, and measurement techniques. Geologic structures and relationships observable in the field. Sediment movement and landform development by moving water, wind, and ice. Crustal processes and planetary evolution in terms of global plate tectonics with an emphasis on ductile and brittle processes.

12.007 **Geobiology: History of Life on Earth**

Surveys the interactive Earth system: biology in geologic, environmental and climate change throughout Earth's history. Introduces the concept of "life as a geological agent" and examines the interaction between biology and the Earth system during the roughly 4 billion years since life first appeared. Topics include the origin of the solar system and the early Earth atmosphere; the origin and evolution of life and its influence on climate up through and including the modern age and the problem of global warming; the global carbon cycle; and astrobiology.

12.373 **Field Oceanography**

Provides an introduction to the biogeochemistry of the ocean, and the field techniques and methods used in its study. Emphasizes biogeochemistry and the interrelated nature of elemental cycling, but also examines physical transport and air-sea gas exchange. Covers multiple aspects related to field instrumentation and measurements, including nutrients, oxygen, the carbon system, temperature, and salinity. Presents microbial analyses, such as metagenomics. Includes an optional spring break field trip aboard a research vessel.

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COURSE 12-FRIENDLY UROP AREAS

Center for Global Change Science
Earth Resources Laboratory
Joint Program on the Science and Policy of Global Change
Kavli Institute for Astrophysics and Space Research (MKI)

GET INVOLVED WITH COURSE 12

Students for the Exploration and Development of Space (SEDS)
Food and Agriculture Club
Fossil Free MIT

SKILLS

Ability to design and conduct research
Data analysis, typically utilizing computer software
Strong technical writing and research proposal ability
Ability to work in interdisciplinary teams

POSSIBLE FUTURE POSITIONS

- **Environmental geologist:** Study the interaction between the geosphere, hydrosphere, atmosphere, biosphere, and human activities to solve problems associated with pollution, waste management, urbanization, and natural hazards.
- **Astronomer:** Solve problems in navigation, space flight, and satellite communications and develop instrumentation and techniques used to observe and collect astronomical data.
- **Planetary scientist:** Study the atmosphere, and physical objects beyond our atmosphere to improve our understanding of planets, satellites, and smaller bodies in the solar system.

CAREER INDUSTRY EXAMPLES

Oil and gas	Government
Research	Environmental preservation
Aerospace and defense	Astronomics

SAMPLE EMPLOYERS

Booz Allen Hamilton	Uplift Hampton Prep	Jet Propulsion Laboratory
Frontier Group	National Parks Service	Observatory of the Cote d'Azur
New Valence Robotics	NASA	Environmental Protection Agency