

Physics and Geosciences

Directors of undergraduate studies: David Poland (dus.physics@yale.edu) (Physics); Pincelli Hull (pincelli.hull@yale.edu) (Earth and Planetary Sciences)

The major in Physics and Geosciences applies fundamental physical principles to the study of the Earth and other planetary bodies, synthesizing concepts and methods from both the Physics majors and the Earth and Planetary Sciences majors.

PREREQUISITES

The prerequisites for the major include MATH 1200 or its equivalent, PHYS 1700, PHYS 1710 or another introductory physics sequence, the physics laboratory course PHYS 2050L, and a course in ordinary differential equations chosen from ENAS 1940, MATH 2460, or PHYS 4000.

REQUIREMENTS OF THE MAJOR

Students are held to the requirements that were in place when they declared their major. However, with approval from the DUS, the following requirements, updated for the academic year 2025–2026, may be fulfilled by students who declared the major in a prior term.

Beyond the prerequisites, the major requires twelve and a half course credits (thirteen course credits if the EPS introductory course has an accompanying laboratory), including the senior project. At least four and a half of these course credits must be in Physics and at least six must be in Earth and Planetary Sciences. Students complete PHYS 2060L and a two- or three-term advanced physics sequence: either PHYS 4010 and PHYS 4020, or PHYS 4100, PHYS 4500, and PHYS 4300. They must also take basic quantum mechanics (PHYS 4390 or PHYS 4400) and one elective numbered PHYS 3000 or above. Relevant classes in related departments may be substituted with the permission of the DUS in Physics. Required courses in Earth and Planetary Sciences include one introductory course numbered EPS 1000–1400, with any accompanying laboratory; one elective numbered EPS 2000 or above; and four advanced electives from one of two EPS tracks: the Atmosphere, Ocean, and Climate track or the Solid Earth Science track. Relevant classes in related departments may be substituted with the permission of the DUS in Earth and Planetary Sciences. No elective course may count toward multiple requirements for the major.

Credit/D/Fail No course taken Credit/D/Fail may be counted toward the requirements of the major, including prerequisites.

Outside credit Courses taken at another institution or during an approved summer or term-time study abroad program may count toward the major requirements with DUS approval.

SENIOR REQUIREMENT

Students complete a two-term senior project on a topic that is appropriate for the combined major and acceptable to both the Physics and the Earth and Planetary Sciences departments. The project is undertaken in either PHYS 4710 and 4720 or EPS 4900 and EPS 4910. In addition, students must present an oral report on their project to each department.

ADVISING

Interested students should consult the directors of undergraduate studies (DUSs) in Physics and in Earth and Planetary Sciences.

SUMMARY OF MAJOR REQUIREMENTS

Prerequisites MATH 1200 or equivalent; PHYS 1700, PHYS 1710 or above; PHYS 2050L; 1 of ENAS 1940, MATH 2460, or PHYS 4000

Number of courses At least 12.5 course credits beyond prereqs, incl senior req

Specific courses required PHYS 2060L; PHYS 4010 and PHYS 4020, or PHYS 4100, PHYS 4500, and PHYS 4300; PHYS 4390 or PHYS 4400

Distribution of courses 1 elective numbered PHYS 3000 or above; 1 intro course in EPS 1000–1400, with lab, as specified; 1 elective course numbered EPS 2000 or above; 4 advanced courses in an EPS track, as specified

Substitution permitted Courses in related departments for PHYS elective and EPS electives with DUS permission

Senior requirement Senior project in PHYS 4710 and 4720 or EPS 4900 and EPS 4910, on topic acceptable to both depts; oral report on project to both depts or equivalent