

PHYSICS, ASTRONOMY & METEOROLOGY

EPS 510 Physical Oceanography 3 SH

This course is a detailed, scientific introduction to physical oceanography. It will consider the physical properties of seawater, important thermodynamic and dynamic processes influencing the oceans, the distribution of currents and oceanic circulation, the formation of water types and masses, as well as ocean waves and coastal processes. Instruments and platforms used to study the ocean will be discussed. *Pre/Corequisite:* PHY 510 or written permission of the instructor.

EPS 530 Planetary Physics 3 SH

This course surveys the structure of planetary bodies in the solar system and the processes that modify them. Among the topics to be covered will be the origin and evolution of the solar system, gravitational interactions between bodies, methods of planetary exploration, dynamics of planetary atmospheres, surface modification and interior structures and compositions. *Prerequisite:* PHY 510 or written permission of the instructor.

EPS 540 Physical Geology 3 SH

This course is an introduction to physical geology. It will develop the basic concepts of physical geology, including examination of the materials composing the Earth as well as understanding the processes, which operate beneath and upon its surface. The physical geology of the other planets in the solar system is briefly introduced. *Pre/Corequisite:* PHY 510 or written permission of the instructor.

EPS 592 Independent Thesis Research in Earth & Planetary Sciences 6 SH

This course is designed for students fulfilling the thesis requirements for the M.A. in Earth and Planetary Sciences degree. Students will submit a thesis proposal; perform independent, original research; write a thesis; and present results in an oral presentation. Individual conferences with the thesis adviser will occur approximately weekly. Credit will be granted upon submission of one copy of an approved final draft of the thesis and thesis abstract. *Pre/Corequisite:* PHY 510, PHY 520 and PHY 590, or written permission from the research thesis adviser and Graduate Program Committee.

EPS 521 Meteorology & Weather Systems 3 SH

This course introduces the student to Newton's Second Law of Motion in a rotating frame of reference and its application to the momentum equations that govern the dynamics of large-scale atmospheric motions. Applications include the geostrophic approximation, circulation and vorticity, quasi-geostrophic analysis and atmospheric waves. *Prerequisite:* PHY 510 or written permission of the instructor.

PHY 510 Thermodynamics 3 SH

This course will develop the basic concepts of classical thermodynamics and apply them to the Earth's atmosphere and oceans, the Earth's lithosphere, mantle and core as well as other planetary environments in the solar system. Equal parts are devoted to theoretical and practical applications. *Prerequisite:* A year of calculus-based general physics.

PHY 520 Scientific Methods 3 SH

This course introduces the application of a variety of physical and mathematical concepts to understanding and establishing scientific research in several disciplines, including: (1) Instrumentation and data acquisition, (2) Numerical modeling and (3) Astronomical instruments and observational techniques. This course will consider at least two of these categories in a modular fashion. *Prerequisite:* A year of calculus-based general physics.

PHY 550 Special Topics in Earth & Planetary Science 2-3 SH

This course is taught as a one-week course in the summer. Each summer features a special topic in one of the disciplines relevant to the field of earth and planetary sciences. The content will rotate between astronomy, meteorology, physical oceanography and physical geology. Faculty or an instructor with expertise in the discipline will teach the course. The instructor will choose the specific topic within each discipline. The basic week-long course is two credits. Students who register for three credits will be given an assignment or project beyond the week-long in-class period. All students will be expected to have read assigned reading prior to the start of the summer course.

PHY 590 Seminar in Earth and Planetary Sciences 3 SH

Each student will perform detailed investigations of three separate major scientific or environmental issues related to earth and planetary sciences. While the instructor(s) will determine a general theme, the specific topic to be investigated by each student will be chosen by the student — subject to the approval of the instructor. Students will then present to the class material from each of these three research topics: via an abstract, an oral presentation and a short paper. *Prerequisite:* A year of calculus-based general physics.

PHY 598 Faculty Developed Course

This experimental course is offered by the physics, astronomy and meteorology department as a means of determining its value to the total department program or in response to a particular request of a group from students. Any semester.

PHY 599 Student Developed Study

This vehicle is designed to provide the student with an opportunity to develop his/her own learning experience. A student will design a project and secure a faculty sponsor. May be utilized more than one time. *Prerequisite:* Written permission of faculty sponsor and department. Registration through the Division of Graduate Studies is required.