PHYSICS - PHY

PHY 104 Seminar for Physics and Pre-engineering Majors 0 Credits
A key aspect of science is the communication of ideas. The seminar is one method of sharing scientific ideas and results. This course gathers Physics and Pre-engineering majors to learn about advances in their respective fields, about related careers, and about the research performed by the department faculty.
Prerequisite: None. Corequisite: None.
Offered: every fall & spring.

PHY 129 Introduction to Astronomy 3 Credits
Understanding modern astronomy by using ideas from basic physics. Mathematics minimized. Naming and viewing stars and constellations is included.
Fulfills College Core: Field 6 (Natural Sciences)
Offered: once a year.

PHY 130 Introductory Geology 3 Credits
For science and non-science majors alike, this course covers the fundamental concepts of physical geology, including the rock cycle; erosion; tectonic processes including earthquakes and volcanism; the importance of water from oceans to rivers to glaciers; and society’s dependence on energy and mineral resources from the Earth. Our planet is an interacting system of matter and energy, giving us mountains, lowlands, oceans, rivers, earthquakes, volcanoes, and the resources we need for human prosperity.
Offered: occasionally.

PHY 131 Earthquakes: Seismology and Society 3 Credits
The science behind earthquakes: causes, locations, frequency and measurement; affects on geography, human structures and society.
Fulfills College Core: Field 6 (Natural Sciences), Global Awareness
Offered: once a year.

PHY 201 College Physics I 3 Credits
College Physics for biological-science students. Mechanics of rigid bodies, mechanics of fluids, thermal energy and thermodynamics.
Prerequisite: MAT 110 or MAT 111. Corequisite: PHY 201L.
Fulfills College Core: Field 6 (Natural Sciences)
Offered: every fall.

PHY 201L College Physics I Laboratory 1 Credit
Laboratory for College Physics I for biological-science students.
Prerequisite: MAT 110 or MAT 111. Corequisite: PHY 201.
Offered: every fall.

PHY 202 College Physics II 3 Credits
College Physics for biological-science students. Electricity and magnetism, geometrical and physical optics.
Prerequisite: minimum grade of C- in PHY 201 and 201L. Corequisite: PHY 202L.
Offered: spring.

PHY 202L College Physics II Laboratory 1 Credit
Laboratory for College Physics II for biological-science students.
Prerequisite: min grade of C- in PHY 201 and 201L Corequisite: PHY 202.
Offered: spring.

PHY 223 General Physics for Physical Science Majors I 3 Credits
Prerequisite: MAT 110 or MAT 111. Corequisite: PHY 223L.
Fulfills College Core: Field 6 (Natural Sciences)
Offered: every fall.

PHY 223L General Physics for Physical Science Majors I Laboratory 1 Credit
Laboratory for calculus-based general physics I.
Prerequisite: MAT 110 or MAT 111 Corequisite: PHY 223.
Offered: every fall.

PHY 224 General Physics for Physical Science Majors II 3 Credits
Calculus-based general physics. Electricity and magnetism, geometrical and physical optics.
Prerequisite: minimum grade of C- in PHY 223 and PHY 223L Corequisite: PHY 224L.
Offered: every spring.

PHY 224L General Physics for Physical Science Majors I Laboratory 1 Credit
Laboratory for calculus-based general physics II.
Prerequisites: min grade of C- in PHY 223 and PHY 223L Corequisite: PHY 224.
Offered: every spring.

PHY 225 General Physics for Physical Science Majors III 3 Credits
Prerequisite: MAT 211 & minimum grade of C- in PHY 224. Corequisite: PHY 225L.
Offered: every fall.

PHY 225L General Physics for Physical Science Majors III Laboratory 1 Credit
Laboratory for calculus-based general physics III.
Corequisite: PHY 225.
Offered: every fall.

PHY 226 Basic Electronics 3 Credits
Circuit analysis, power supplies, semiconductor physics, operational amplifiers, digital electronics. Integrated circuit techniques. Includes laboratory work each week.
Prerequisite: minimum grade of C- in PHY 224. Corequisite: PHY 226L.
Offered: spring.

PHY 226L Basic Electronics Laboratory 1 Credit
Laboratory for basic electronics course.
Corequisite: PHY 226.
Offered: every spring.

PHY 330 Electrodynamics I 3 Credits
Static and time-varying classical electric and magnetic fields in free-space and matter. Prior completion of or concurrent registration for PHY 335 is strongly encouraged.
Prerequisite: PHY 224.
Offered: fall of odd-numbered years.

PHY 331 Electrodynamics II 3 Credits
Primary topic: electromagnetic waves in free-space and matter, beginning with the Maxwell equations. Additional topics: radiation and special relativity.
Prerequisite: PHY 330.
Offered: spring of even-numbered years.

PHY 332 Statistical and Thermal Physics 3 Credits
Develops statistical concepts and methods used to relate macroscopic to microscopic descriptions of many particle systems.
Prerequisite: PHY 225.
Offered: spring of odd-numbered years.
PHY 335 Mathematical Analysis for Physicists 4 Credits
Theory and applications of infinite series, Fourier series, Green’s functions, Fourier integrals, vector calculus, linear algebra, partial differential equations, and complex variable.
Prerequisite: MAT 222 or permission of instructor.
Offered: fall of odd-numbered years.

PHY 350 Modern Physics Laboratory 1 Credit
This course covers the basic principles of 20th century modern physics. The topics include blackbody radiation, particle/wave duality, x-ray diffraction, Bohr’s model of the atom, quantum tunneling, and the Schrodinger equation.
Prerequisite: PHY 225.
Fulfills College Core: Advanced Writing-Intensive
Offered: every fall.

PHY 351 Advanced Laboratory 1 Credit
This course emphasizes advanced experiments and experimental technique. Topics include, but are not restricted to, dosimetry, radiation detection, gamma-ray spectroscopy, Rutherford scattering, atomic spectroscopy, thin-film deposition, and magnetic resonance.
Prerequisite: PHY 225.
Fulfills College Core: Oral Communication
Offered: every spring.

PHY 443 Classical Mechanics 3 Credits
One, two, and three dimensional motion of a particle, non-inertial systems, classical scattering, rigid-body motion. Lagrange and Hamilton equations, calculus of variations, oscillations.
Prerequisite: PHY 224 & MAT 222.
Offered: fall of even-numbered years.

PHY 445 Special Topics in Physics 1 Credit
This course will cover model formation and development using archival journal articles in physics. The subject material will rotate by semester among topics such as astrophysics, quantum theory, and thermodynamics. Students will be expected to read and critique journal articles, lead discussions on journal articles, and trace the development of an area of physics through assigned readings.
Prerequisite: permission of instructor. Restriction: must be physics major or minor with senior standing.
Offered: spring of odd-numbered years.

PHY 446 Quantum Mechanics I 4 Credits
Corequisite: PHY 225 & MAT 222.
Offered: fall of even-numbered years.

PHY 447 Quantum Mechanics II 3 Credits
Application of Schrodinger’s equation, Hamiltonian mechanics, angular momentum, intrinsic spin, parity, and time-dependent quantum mechanics. PHY 446 is highly recommended.
Offered: spring of odd-numbered years.

PHY 449 Nuclear Physics Lab 1 Credit
Introduction to experimental nuclear physics. Experiments study nuclear instrumentation, characteristics of radiation and nuclear spectra.
Prerequisite: PHY 446.
Fulfills College Core: Advanced Writing-Intensive
Offered: occasionally.

PHY 498 Senior Project 1-3 Credits
A one-semester research project done under the supervision of a faculty member. Prerequisite: permission of department chair. Restriction: senior standing in physics.
Offered: spring.

PHY 499 Independent Study 1-3 Credits
An independent study with a faculty member of the Physics Department. Independent studies require an application and approval by the associate dean.
Prerequisite: permission of the instructor, department chair, & associate dean. Restriction: permission of the chair.
Offered: fall & spring.