

PHYSICS (PHYS)

PHYS-COMP WRITTEN COMPREHENSIVES (0 Credits)

PHYS-103 GENERAL PHYSICS I (3 Credits)

An introductory course in physics for students of science and engineering. Topics include: vectors, statics, dynamics, rotation, conservation laws, vibrations and thermodynamics. Students without calculus admitted with permission of instructor.

Corequisite(s): TAKE MATH-151

PHYS-104 GENERAL PHYSICS II (3 Credits)

Topics include: electricity and magnetism, circuit analysis, electromagnetic waves, optics and modern physics. Students without calculus admitted with permission of instructor.

Prerequisite(s): Take PHYS-103 MATH-151

PHYS-110 PHYSICS FOR MEDICAL TECHNICIAN (4 Credits)

A one-semester general physics course which emphasizes the principles of physics that are most important to a medical technician. The course topics include optics, forces, motion, energy, heat, fluids, electricity and radioactivity.

PHYS-201 THEORETICAL MECHANICS (3 Credits)

Vector algebra and calculus. Kinematics of a point. Dynamics of a system of points. Kinematics of rigid bodies. Impulse, momentum, work and energy.

Prerequisite(s): Take PHYS-103 PHYS-104

PHYS-203 MODERN PHYSICS (3 Credits)

A study of transition from classical to modern physics. Topics treated are relativity, electromagnetic radiation, discoveries of electron and nucleus, Bohr Theory of atomic structure and introductory quantum mechanics. (formerly Atomic Physics).

Prerequisite(s): Take PHYS-103 PHYS-104

PHYS-252 ENGINEERING MECHANICS (3 Credits)

The study of statics and dynamics with engineering applications. Deformation, strain and stresses in solids of one, two, and three dimensions. Introduction to the mechanics of continuous media, the kinematics and dynamics of fluids; viscous flow, turbulence. Bernoulli's theorem and the Navier-Stokes equation.

Prerequisite(s): Take PHYS-103 PHYS-104

PHYS-301 ELECTRICITY & MAGNETISM I (3 Credits)

Topics covered include vector analysis, selected topics in vector calculus, the electrostatic field of force, Gauss' law and the application of these principles to the solution of problems involving various geometries is considered. The electrostatic field in dielectric media, boundary value problems in dielectric media and electrostatic energy and the application of energy concepts are studied. Electric current and circuit analysis are included. Other topics include the magnetic field of steady currents, electromagnetic induction, magnetic properties of matter, magnetic energy, slowly varying currents, Maxwell's Equations and the applications of Maxwell's Equations.

Corequisite(s): Take MATH-251 MATH-252 PHYS-103 PHYS-104

PHYS-302 ELECTRICITY & MAGNETISM II (3 Credits)

Corequisite(s): Take PHYS-301

PHYS-304 THERMODYNAMICS (3 Credits)

Temperature, thermodynamic systems, work, the First Law, heat, ideal gases, the Second Law, reversibility and irreversibility, the Carnot cycle, entropy, Boltzmann statistics, equipartition of energy. Introductory statistical mechanics.

Corequisite(s): PHYS-103 AND PHYS-104

PHYS-309 EXPERIMENTAL PHYSICS I (3 Credits)

This course introduces the student to the experimental techniques associated with the intermediate level physics courses. Choice of experiments will depend upon the student's background and interest.

Corequisite(s): PHYS-103, PHYS-104, PHYL-103, PHYL-104

PHYS-312 INTERN. IN APPLIED PHYSICS (3 Credits)

This course is a practicum designed to give qualified juniors an opportunity to spend a summer in a structured industrial or research setting so that they can immerse themselves in a project involving applied physics. Open to second-semester junior physics majors and with special permission students with a physics minor.

PHYS-403 ELECTRONICS (3 Credits)

This course is designed for the student who desires a basic training in electronics. The course seeks to acquaint the student with the physical principles which govern the use of electronic devices and to allow the student to use these components in the design of circuits.

PHYS-404 SOLID STATE (3 Credits)

Crystal Structures and solids. Lattice vibrations. Thermal properties of solids,

Corequisite(s): Take PHYS-203

PHYS-406 INTRODUCTORY QUANTUM MECHANICS (3 Credits)

De Broglie waves and wave packets, the Schroedinger equation, applications to one-dimensional problems, the hydrogen atom, perturbation theory, angular momentum and electron spin.

Prerequisite(s): Take PHYS-203

PHYS-407 TOPICS IN BIOPHYSICS (3 Credits)

A study of the principles and experimental techniques of physics as they apply to biological systems. Special emphasis will be given to the interactions as they occur on the molecular level.

PHYS-408 OPTICS (3 Credits)

Study of wave motion, Huygen's principle, dispersion. Some facts concerning the spectrum, interference, diffraction, double refraction, plane polarized light, the electromagnetic theory of light, velocity of light, the origin of spectra.

PHYS-409 EXPERIMENTAL PHYSICS II (3 Credits)

This course is a continuation of Physics 309. Experiments of a more sophisticated nature are available. The experiments are related to lecture courses at the senior level.

PHYS-410 SPECIAL PROBLEMS IN PHYSICS (3 Credits)

Designed to allow qualified seniors to undertake independent study or experimentation in some subject in physics under the direct supervision of one of the department staff. Modern computer methods will be employed wherever possible so that the student may become acquainted with the programming, etc.

PHYS-451 APPLIED PROB.COMPUTATIONAL PHY (3 Credits)

Problem solving in a wide range of engineering and physics applications, including electricity and magnetism, solid and fluid mechanics, optics, thermal physics, atomic and nuclear physics. Emphasis is placed on numerical methods, approximation techniques and advanced computer skills for solutions of problems arising in realistic engineering situations.

Prerequisite(s): Take CS-127 or ENGR-220

PHYS-452 Applied Methods in Computational Physics (3 Credits)

Practice in the numerical solution of differential equations and systems of such equations. Finite difference and finite element methods are used on applications drawn from several areas of physics and engineering.

Prerequisite(s): Take PHYS-451

PHYS-490 SENIOR COMPREHENSIVES (0 Credits)

This is an oral comprehensive required of all physics seniors.