

# PHYSICS (PHYS)

## 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 Take PHYL-103

## 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

**Corequisite(s):** PHYL-104

## 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-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.

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

## PHYS-302 ELECTRICITY & MAGNETISM II (3 Credits)

**Prerequisite(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.

**Prerequisite(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.

**Prerequisite(s):** PHYS-103, PHYS-104, PHYL-103, PHYL-104

## PHYS-312 INTERNSHIP 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,

**Prerequisite(s):** Take PHYS-203

## PHYS-406 INTRODUCTORY QUANTUM MECHANICS (3 Credits)

De Broglie waves and wave packets, the Schrodinger 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-451 APPLIED PROBLEMS COMPUTATIONAL PHYSICS (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-490 SENIOR COMPREHENSIVES (0 Credits)

This is an oral comprehensive required of all physics seniors.