

# PHYSICS (PHYS)

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## **PHYS 5500. Earth Science. (3 Credits)**

Exploration of basic concepts and processes in the earth sciences. Content areas include astronomy, geology and meteorology. Strategies of teaching earth science in the middle and high schools will be explored, also.

## **PHYS 5501. Foundations of Physical Science. (3 Credits)**

Foundations of Physical Science is the study of basic principles of physical science and their relation to the teaching of science in the elementary school.

## **PHYS 5530. Introductory Physical Science 1. (3 Credits)**

This course is designed to prepare students to learn introductory physical science in the secondary school. This course updates and enlarges the student's knowledge in physical science and familiarizes him/her with the materials and methods utilized in I.P.S.

## **PHYS 5531. Introductory Physical Science. (3 Credits)**

This course is designed to prepare students to learn introductory physical science in the secondary school. This course updates and enlarges the student's knowledge in physical science and familiarizes him/her with the materials and methods utilized in I.P.S.

## **PHYS 5547. Introduction to Oceanography. (3 Credits)**

This course emphasizes physical, chemical, geologic and biologic characteristics of the oceans and the interaction between hydrosphere, atmosphere and biosphere.

## **PHYS 5548. Introduction to Astronomy. (3 Credits)**

This course will emphasize topics related to the theory and consideration of planets, the solar system, stars, galaxy and universe, including the study of constellations, historical overview, astronomy and laws of planetary motion.

## **PHYS 5549. Weather and Climate. (3 Credits)**

This course emphasizes an introduction to the study of the profiles and dynamics of air masses and an overview of system to climatic effects and global distribution of climates.

## **PHYS 5551. Mathematics of Physics I. (3 Credits)**

This course will emphasize algebra of vectors, vector calculus, divergence, gradient, curl, line integrals, surface integrals, divergence of theorem of Gauss, Stokes' theorem, conservative fields, orthogonal curvilinear coordinates, matrices and eigenvalue problems.

## **PHYS 5552. Mathematics of Physics II. (3 Credits)**

This course will emphasize derivation and solution of partial differential equations of physics, wave equation and Laplace's equation, Schroedinger's equation, power series solution of ordinary differential equations, and special functions of mathematics physics, Fourier series, Sturm-Liouville system, complex analysis and integration will be considered, also.

## **PHYS 5564. Science Concepts. (3 Credits)**

Focus on the understanding and application of scientific processes and major concepts relevant to the teaching of middle childhood science.

## **PHYS 5645. Physics for Secondary School Teachers. (3 Credits)**

This course is designed to both refresh and enlarge the high school teacher's knowledge of general physics.

## **PHYS 5646. Modern Physics For Secondary Teachers I. (3 Credits)**

This course is designed to provide students an introduction to special relativity, quantum mechanics and atomic structure. Prerequisite: General Physics.

## **PHYS 5647. Modern Physics for Secondary Teachers II. (3 Credits)**

This course is designed to provide students an introduction to x-ray spectra, molecular structure, solid-state physics, nuclear structure and nuclear reactions. Prerequisite: PHYS 5646.

## **PHYS 5660. Classical Mechanics I. (3 Credits)**

This course will emphasize elements of Newtonian mechanics, motion of particles in various dimensions, motion of system of particles, rigid bodies, gravitational and coordinate systems.

## **PHYS 5661. Classical Mechanics II. (3 Credits)**

This course will emphasize mechanics of continuous media, Lagrange's equations, tensor algebra, inertia and stress tensors, rotation of a rigid body and theory of small vibrations. Prerequisite: Consent of instructor.

## **PHYS 5670. Electricity and Magnetism I. (3 Credits)**

This course will emphasize electrostatics, steady currents and the magnetic properties of matter.

## **PHYS 5671. Electricity and Magnetism II. (3 Credits)**

This course will emphasize the development of field theory leading to Maxwell's equations, plane waves and solutions of Maxwell's equations. Prerequisite: Consent of instructor.

## **PHYS 5681. Introduction to Quantum Mechanics. (3 Credits)**

This course will emphasize Schroedinger's theory of quantum mechanics; solutions of Schroedinger's equation; perturbation theory; one-electron atoms; magnetic moments, spin and relativistic effects; identical particles and multi-electron atoms.

## **PHYS 5685. Seminar in the Teaching of Physics. (3 Credits)**

This course will emphasize methods of teaching physics stressing the planning of curricula and laboratory programs.