

# PHYSICS (PHYS)

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## **PHYS 800 – Advanced Physical Science 3 credit hours**

An inquiry-oriented course involving the study of selected areas of physics, such as motion, electricity, light, and heat. This course will allow the student to learn science content by working with concrete materials as well as acquaint the student with teaching strategies and materials. Students will be required to complete a project for the course.

## **PHYS 801 – Earth Science 3 credit hours**

The basic laws of physics, chemistry and geology are investigated and applied to earth science, meteorology and astronomy. Student interaction is used to sharpen the ability to observe, reason and communicate.

## **PHYS 805 – Introduction to Engineering 3 credit hours**

Introduce students to the engineering profession, how to prepare for an exciting career, the design process, engineering communication, and ethics. Also, students will be introduced to the basic principles, engineering fundamentals, and physical laws that will be encountered repeatedly during the study of engineering disciplines. Moreover, to introduce students to engineering drawings, schematics that are important in conveying useful information to other engineers and machinists, and visualization of proposed products. Finally, introduce students to important mathematical, statistical, and economical concepts.

## **PHYS 809 – Meteorology 3 credit hours**

An investigation and application of the basic principles of physics and chemistry to the understanding of weather including a study of the atmosphere's origin, composition, circulation patterns, energy budget and its role in the hydro-logic cycle. Topics include: instruments for observation, precipitation process, wave cyclones, jet streams, weather forecasting, weather modification and applications of meteorology to air pollution, agriculture, and aviation.

## **PHYS 810 – Mathematical Techniques in the Physical Sciences 4 credit hours**

A formal development of selected topics from infinite series, power series, complex numbers and coordinate transformations, linear algebra, determinants and matrices, multiple integrals, vector analysis, Fourier series and transforms, probability, and statistics. Students should have completed at least two semesters of college calculus before enrolling in this course.

## **PHYS 811 – Astronomy 3 credit hours**

The basic principles of astronomy are studied and applied through research and observation to topics ranging from sunspots and meteors, to quasars, pulsars and black holes.

## **PHYS 813 – Intro to A&D Electronics 4 credit hours**

An introduction to the analysis and design of analog and digital electronic circuits. Basic analysis and design are covered. Laboratory activities are designed to support the lectures. Applications to computers, television, radio, and automobiles are discussed. Students should have completed one semester of college level general physics with Ohm's law and simple circuits AND two semesters of general calculus before enrolling in this course.

Additional Course Fee Required

## **PHYS 817P – Quantum Mechanics 3 credit hours**

A formal development of the principles of quantum mechanics. The mathematics of Hamiltonian Mechanics are presented as a bridge from Classical Physics to Quantum Physics. Topics are selected to extend the treatment given in Modern Physics II.

Prerequisite: PHYS 411 or permission of instructor

## **PHYS 825 – Classical Mechanics 3 credit hours**

The Newtonian, Lagrangian, and Hamiltonian formulation of the laws of motion, including the dynamics of rigid bodies.

Department Consent Required

## **PHYS 830P – Optics 4 credit hours**

Geometric and wave optics including optical instruments.

Prerequisite: PHYS 276 and PHYS 276L and MATH 202

## **PHYS 840P – Heat and Thermodynamics 4 credit hours**

The study of temperature, heat, and work, the laws of thermodynamics, heat engines, Maxwell's relations and an introduction to statistical thermodynamics.

Department Consent Required

## **PHYS 846P – Modern Physics 4 credit hours**

An advanced study of selected topics in electricity and modern physics including introductory concepts in atomic and nuclear physics. Research or design of educational projects will be used to aid in explaining these areas. Students should have completed two semesters of either algebra-based physics or calculus-based physics with labs.

Department Consent Required