

# Physics (PHYS)

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**PHYS 5040. Electronics. 4 Hours.**

A lecture-laboratory study of basic electrical circuits and techniques, including extensive use of the oscilloscope. Both continuous wave and pulse phenomena are treated.

**PHYS 5100. Optics. 4 Hours.**

An advanced course with emphasis on physical optics. Lens matrices, interference, polarization, dispersion, absorption, resonance, and quantum effects will be covered. The electromagnetic nature of light is emphasized. Students will be required to implement a project that involves applying theory to an experiment, performing the experiment, analyzing the results, and writing a paper reporting on the results.

**PHYS 5810. Mathematical Methods of Physics. 3 Hours.**

Special topics in mathematics as related to advance study in physics. Topics include vector analysis, differential equations, orthogonal functions, eigenvalue problems, matrix methods, and complex variables.

**PHYS 5820. Computational Physics. 3 Hours.**

Topics include formulation of equations describing physical systems and the use of computers to solve them, computer simulations of physical systems, the use of computers to acquire and analyze data, and graphical methods of displaying data.

**PHYS 6040. Experimental Physics. 4 Hours.**

A lecture-laboratory course devoted to techniques of research in experimental physics. Topics include treatment of data, vacuum techniques, magnetic devices, preparation and manipulation of beams of particles and radioactivity. A number of modern physics experiments are studied and performed.

**PHYS 6111. Theoretical Mechanics I. 3 Hours.**

Topics include Newtonian Mechanics, conservation laws, Lagrange's equations, and relativity.

**PHYS 6112. Theoretical Mechanics II. 3 Hours.**

Topics include Newtonian Mechanics, conservation laws, Lagrange's equations, and relativity.

**PHYS 6211. Electromagnetism I. 3 Hours.**

Topics include electrostatics, magnetostatics, time varying electric and magnetic fields, Maxwell's equations, and propagation of electromagnetic waves.

**PHYS 6212. Electromagnetism II. 3 Hours.**

Topics include electrostatics, magnetostatics, time varying electric and magnetic fields, Maxwell's equations, and propagation of electromagnetic waves.

**PHYS 6310. Statistical Physics. 3 Hours.**

A study of kinetic theory and statistical mechanics with a brief treatment of classical thermodynamics.

**PHYS 6411. Modern Physics I. 3 Hours.**

An introduction to 20th century physics with the emphasis on quantum mechanics and its applications to atomic and nuclear structure, and to solid state physics. Both wave and matrix formalisms are developed, along with their experimental implications.

**PHYS 6412. Modern Physics II. 3 Hours.**

An introduction to 20th century physics with the emphasis on quantum mechanics and its applications to atomic and nuclear structure, and to solid state physics. Both wave and matrix formalisms are developed, along with their experimental implications.

**PHYS 6800. Internship in Physics. 3-6 Hours.**

Active participation in research in physics or in a field of science closely allied with physics, such as biophysics. A daily log of activities, a report on the work done, and a research paper relating the work done to the field of physics are required.

**PHYS 6900. Special Topics in Physics. 1-6 Hours.**

Topics to be assigned by instructor; may be taken more than once if topics are different, up to a total of 6 credit hours.

**PHYS 6950. Directed Study in Physics. 1-6 Hours.**

Study in area or subject not normally found in established courses offered by the department; may also allow student to explore in more detail and/or depth an area or subject covered by the department in physics. Up to a maximum of 12 credit hours.