

PHYS: Courses in Physics

Department of Natural Science

PHYS 101 Elements of Physics I 4 Cr

A survey course designed primarily for non-science majors. This course satisfies the CORE requirement for science. Topics include classical mechanics and states of matter. Three one-hour lectures and one two-hour laboratory per week. Prerequisite: Proficiency in elementary algebra. Fall semester, if sufficient demand.

PHYS 102 Elements of Physics II 4 Cr

A continuation of PHYS 101, covering topics in heat, light, sound, and modern physics. This course satisfies the CORE requirement for science. Three one-hour lectures and one two-hour laboratory per week. Prerequisite: Proficiency in elementary algebra. Note: PHYS 101 is not a prerequisite for this course. Spring semester, if sufficient demand.

PHYS 201 Physics I: Mechanics, Wave Motion, & Sound 4 Cr

An introductory calculus-based physics course, with emphasis on the principles of physics, for health science majors. Topics include classical mechanics, oscillatory (wave) motion, sound, and the behavior of solids and fluids. Three (3) hours lecture and one two-hour laboratory per week. Prerequisites: MA 122 or MA 131. Students must pass prerequisites with a grade of "C" or better to enroll in PHYS 201. Fall semester.

PHYS 202 Physics II: Thermodynamics, Electricity and Magnetism, Optics, and Modern Physics 4 Cr

A continuation of PHYS 201. Topics include thermal physics, electrical and magnetic phenomena, simple electrical circuits, optics, and quantum physics. Three (3) hours lecture and one two-hour laboratory per week. Prerequisite: PHYS 201. Students must pass prerequisites with a grade of "C" or better to enroll in PHYS 202. Spring semester.

PHYS 205 Engineering Physics I: Mechanics 4 Cr

For mathematics and engineering majors. Statics, kinematics, and dynamics of particles and rigid bodies, work and energy, conservation of energy and momentum (linear and angular), harmonic motion. Three (3) hours lecture and one two-hour laboratory per week. Prerequisite: MA 122 or MA 131 required, high school physics recommended. Students must pass prerequisites with a grade of "C" or better to enroll in PHYS 205. Fall semester.

PHYS 206 Engineering Physics II: Electricity and Magnetism 4 Cr

Electrostatics and Gauss' Law, dielectrics, DC circuits, electromotive force, magnetic field and magnetic properties of matter. Three (3) hours lecture and one two-hour laboratory per week. Prerequisite: PHYS 205 required, high school physics recommended. Students must pass PHYS 205 with a grade of "C" or better to enroll in PHYS 206. Spring semester.

PHYS/ENGR 305 Electronics and Circuit Analysis I 4 Cr

An introductory survey of the behavior of electrical circuits. Review of current, voltage, and passive circuit elements (resistors, capacitors, and inductors). Kirchhoff's Laws, network theorems, and basic network analysis. General characteristics of amplifiers and electronic instrumentation. Introduction to operational amplifiers and active elements (transistors). Laplace transform analysis of transient (switching) response, and complex phasor analysis of sinusoidal steady-state response. Three (3) hours lecture and one

two-hour laboratory per week, in which students build and test circuits and learn how to use typical circuit simulation software (PSPICE). Prerequisites: Grades of "C" or better in PHYS 202 or PHYS 206, and MA 122 or MA 233. Fall semester.

PHYS/ENGR 306 Electronics and Circuit Analysis II 4 Cr

A continuation of PHYS/ENGR 305. Systematic node-voltage and mesh-current methods of circuit analysis. Network transfer functions and frequency spectra. Mutual inductance and transformers. Diode circuits and the behavior of single-transistor amplifiers using field-effect or bipolar-junction transistors. Analysis and design of digital logic circuits. Principles of operation and interfacing of typical laboratory instruments. Three (3) hours lecture and one two-hour laboratory per week. Prerequisite: Grade of "C" or better in PHYS/ENGR 305. Offered spring semesters if warranted by sufficient demand.

PHYS/ENGR 308 Thermodynamics 3 Cr

A practical introduction to thermodynamics for engineering students. Fundamental state variables are defined (e.g., temperature, pressure, energy, enthalpy, entropy, etc.), and the three laws of thermodynamics are extensively discussed and illustrated. Applications include power systems, gas turbines, and refrigerators. Three (3) hours lecture per week. Prerequisites: Grades of "C" or better in PHYS 205-206 and MA 334. Spring semester.

PHYS 321 Optics and Electromagnetic Radiation 3 Cr

A survey of geometrical and physical optics, including the behavior of electromagnetic radiation across the spectrum. Topics include the dual wave/particle nature of radiation, lenses and ray-tracing, analysis of simple optical instruments (microscopes, telescopes), interference and diffraction phenomena, lasers and holography. Two (2) 75-minute periods per week, one of which may be used for laboratory exercises. Prerequisite: PHYS 206. Offered fall semesters if warranted by sufficient demand.

PHYS 322 Modern Physics 3 Cr

An introduction to the highlights of twentieth-century physics: quantum mechanics, special and general relativity, and selected topics in atomic and nuclear physics. Students pursuing a Physics minor (but not a Physics for Secondary Education minor) are required to co-enroll in PHYS 322L. Three (3) hours lecture per week. Prerequisite: PHYS 202 or PHYS 206. Offered spring semesters if warranted by sufficient demand.

PHYS 322L Mathematical Methods of Modern Physics 1 Cr

A computational laboratory section which meets once per week, required of students pursuing a Physics minor. (Students pursuing a Physics for Secondary Education minor need enroll in PHYS 322 only). This laboratory section explores in more mathematical detail such topics as solutions of Schrodinger's equation, relativistic transformations, Monte Carlo simulations, and chaotic dynamics. One two-hour laboratory per week. Prerequisites: PHYS 206 and co-enrollment in PHYS 322. Offered spring semesters if warranted by sufficient demand.