

PHYSICS (PHYS)

PHYS 1101. General Physics Laboratory I. 1 Hour.

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PHYS 1102. General Physics Laboratory II. 1 Hour.

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PHYS 1105. Class Phy & Thermodynamics Lab. 1 Hour.

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PHYS 1301. General Phy-Mechanics & Heat. 3 Hours.

A modern treatment is made of the laws and principles of mechanics and heat. Derivations are carefully done using a non-calculus approach and considerable problem work is required. The laboratory work consists of quantitative experiments.

Prerequisite: MATH 1410 or MATH 1316 or MATH 1420 with a grade of C or better.

PHYS 1302. Gen Phy-Snd,Lght, Elec, & Mag. 3 Hours.

The course is a continuation of PHYS 1301, covering the subjects of sound, light, electricity and magnetism. The same emphasis is placed on derivations and problem solving as in PHYS 1301. The laboratory work consists of quantitative experiments.

Prerequisite: PHYS 1301, MATH 1316.

PHYS 1305. Classical Physics & Thermdynmc. 3 Hours.

This is an elementary course covering the fundamentals of motion, forces and heat.

PHYS 1401. Physics Boot Camp. 4 Hours.

This course reviews the essential survival-level skills of problem analysis required for the first two years of the pre-engineering and physics curricula. It provides familiarity with the core problem-solving tools required for the first two years of work in these majors. A weekly problem recitation session is integrated.

Prerequisite: Departmental approval.

PHYS 1403. Stars & Galaxies. 4 Hours.

The study of the universe beyond the solar system. Topics include the nature of stars, stellar evolution, galaxies, quasars, cosmology, the universe as a whole, and theories about the origin and fate of the universe. Along the way, students will be introduced to tools astronomers use to determine such properties as temperatures, compositions, motions, masses, and evolution of astronomical objects.

PHYS 1404. Solar System Astronomy. 4 Hours.

The study of the solar system as well as other planetary systems. Topics include the nature of science, apparent motions in the sky, the historical development of the laws governing the solar system, the structure and membership of solar system objects, the formation of the solar system, and extrasolar planets and our understanding of other solar systems.

PHYS 1411. Introduction To Physics I. 4 Hours.

A thorough introduction to the more general topics in mechanics. Considerable attention is given to the solution of problems with the emphasis placed on fundamental concepts. A laboratory/problem session is an integral part of the course. Writing Enhanced. Prerequisites MATH 1420 with a C or better.

PHYS 1422. Introduction To Physics II. 4 Hours.

An introduction to the general topics of electricity and magnetism, and basic electrical circuits. The emphasis continues to be on problem solving with the laboratory/problem session an integral part of the course. Writing enhanced.

Prerequisite: PHYS 1411 and MATH 1430 with a C or better.

PHYS 2426. Heat, Waves & Modern Physics. 4 Hours.

An introduction to topics in heat and wave motion including sound and light. The quantitative description of phenomena is emphasized. The laboratory continues as an integral part of the course. Writing enhanced.

Prerequisite: PHYS 1411 and MATH 1420.

PHYS 3111. Modern Physics Laboratory I. 1 Hour.

Modern Physics Lab. Writing Enhanced.

Prerequisite: Grade of C or better in PHYS 1422.

PHYS 3115. Electronic & Circuit Anlys Lab. 1 Hour.

Writing Enhanced.

Prerequisite: Minimum grade of C in PHYS 1422.

PHYS 3117. Astronomy Laboratory. 1 Hour.

Writing Enhanced.

PHYS 3360. Statics And Dynamics. 3 Hours.

Study of equilibrium, kinematics and dynamics of particles and rigid bodies using concepts of force, mass, and energy, and momentum. Vectors, calculus and differential equations are used.

Prerequisite: PHYS 1411 and MATH 2440.

PHYS 3370. Intro To Theoretical Physics. 3 Hours.

This course covers the relationship of theoretical physics and mathematics. It will help the students apply mathematics to problems in physics with emphasis on the theoretical aspects of classical mechanics, electromagnetism, wave mechanics, and computational physics.

Prerequisite: PHYS 1422 and MATH 2440 with a grade of C or better.

PHYS 3391. Modern Physics I. 3 Hours.

Relativity is introduced, quantum theory of light, Compton effect, photoelectric effect, Bohr atom, particles as waves, quantum mechanics in one dimension, tunneling, and atomic structure are covered. PHYS 3111 must be taken concurrently.

Prerequisite: Minimum grade of C in MATH 2440 and PHYS 1422.

PHYS 3395. Electronics & Circuit Analysis. 3 Hours.

Active circuit analysis, analog and digital integrated circuits, selected discrete components, and application to certain digital and analog systems are studied. PHYS 315 must be taken concurrently.

Prerequisite: Grade of C or better in PHYS 1422.

PHYS 3397. Astronomy. 3 Hours.

A study is made of the solar system, sun, stars, and stellar systems, their motions, structure, energy sources and evolution, star clusters, interstellar matter, galaxies, and cosmology.

Prerequisite: PHYS 3117 must be taken concurrently.

PHYS 3398. Astronomy-Honors. 3 Hours.

PHYS 4110. Adv Undergrad Laboratory I. 1 Hour.

This laboratory course provides additional, in-depth laboratory experience for physics majors and minors and transfer students. It will emphasize measurement and data handling. Writing enhanced.

PHYS 4113. Light And Optics. 1 Hour.

Writing Enhanced.

PHYS 4331. Physics For Forensic Sciences. 3 Hours.

Forensic science makes use of a number of physical techniques. This course is designed to provide a student with an understanding of the physics used in forensic science that enhances the standard introductory physics course. Topics covered include interior and exterior ballistics, optics, stress and strain, elementary fluid mechanics.

PHYS 4333. Light And Optics. 3 Hours.

The wave theory of light is emphasized. The phenomena of interference, diffraction and polarization are treated both theoretically and in selected laboratory experiments. The theory and applications of lasers are discussed and investigated in the laboratory.

Prerequisite: PHYS 1422 with a C or better.

PHYS 4366. Intro Quantum Mechanics. 3 Hours.

This course includes introductory quantum mechanics, application of quantum theory to the harmonic oscillator, potential barriers, the hydrogen atom, theory of atomic spectra, the free electron, and elementary band theory of solids.

Prerequisite: PHYS 3391, MATH 3376 and MATH 3391 with a grade of C or better.

PHYS 4367. Intro To Solid State Physics. 3 Hours.

This course introduces the concepts of crystal structure, crystal diffraction, reciprocal lattices, crystal binding, phonons, free electron Fermi gas, semiconductors, energy bands, Fermi surfaces, point defects, and optical properties of crystals.

Prerequisite: Minimum grade of C in PHYS 3391.

PHYS 4368. Electricity And Magnetism. 3 Hours.

Properties of dielectrics and magnetic materials, electromagnetic fields, and Maxwell's equations are studied.

Prerequisite: Minimum grade of C in MATH 3376 and PHYS 1422.

PHYS 4370. Classical Mechanics. 3 Hours.

The dynamics of rigid bodies, vibrating systems and normal coordinates, and other selected topics of advanced mechanics are stressed. Lagrangian and Hamiltonian concepts are introduced.

Prerequisite: MATH 3376.

PHYS 4371. Thermodynamics & Statistical Mech. 3 Hours.

Basic concepts of classical thermodynamics, including the first and second laws, properties of gases, entropy, thermodynamic functions, and introductory statistical mechanics are studied.

Prerequisite: PHYS 3391 and MATH 3376.

PHYS 4395. Undergraduate Research. 3 Hours.

This course consists of special projects or topics in experimental or theoretical physics for individual physics students. Each student pursues an approved project of interest to him, or he may participate in one of the organized research programs conducted by the physics faculty. The projects are supervised by the physics faculty, but each student is expected to demonstrate individual initiative in planning and conducting the research program or topic. Writing enhanced. The course may be repeated for an additional three semester hours credit with consent of Department Chair. This course should be taken in addition to hours required for physics major or minor and may be taken for Academic Distinction Credit. See Academic Distinction Program in this catalog.

Prerequisite: Consent of Department Chair.

PHYS 4396. Selected Topics In Physics. 3 Hours.

May be repeated for additional credit.

Prerequisite: Consent of the instructor.

PHYS 4398. Senior Thesis. 3 Hours.

This is a directed elective for senior students majoring in physics seeking additional experience in a sophisticated research project. This research will be conducted under the supervision of a member of the physics faculty and the results will be presented in the form of a thesis. Writing enhanced.