

PHYSICS (PHYS)

PHYS 1101 General Physics I Lab

Laboratory#based course to accompany PHYS 1301. Laboratory experiments reinforce PHYS 1301 principle of physics, and place importance on scientific communication and collaboration, as well as measurement methods, data collection, basic error analysis, and preparation of laboratory report. Carries no credit towards a major or minor in physics.

Corequisites: PHYS 1301.

TCCN: PHYS 1101

PHYS 1102 General Physics II Lab

Laboratory#based course to accompany PHYS 1302. Laboratory experiments reinforce PHYS 1302 principle of physics, and place importance on scientific communication & collaboration, as well as measurement methods, data collection, basic error analysis, and preparation of laboratory report. Carries no credit toward a major or minor in physics. Must be taken concurrently with PHYS 1302.

Prerequisites: PHYS 1301 and PHYS 1101.

TCCN: PHYS 1102

PHYS 1170 Survey of Physical Science Lab

Laboratory course to accompany PHYS 1370. Laboratory exercises reinforce PHYS 1370 lecture material and place importance on scientific communication and collaboration as well as measurement methods. Some mention is made of uncertainty and basic error analysis. Must be taken concurrently with PHYS 1370. Carries no credit towards a major or minor in physics.

TCCN: PHYS 1115

PHYS 1301 General Physics I

Fundamental principles of physics, is the first of a two semester sequence in General Physics, using algebra and trigonometry; the principles and applications of classical mechanics and thermodynamics. Topics include: kinematics, dynamics, gravitation, energy, momentum, simple harmonic motion, fluid and heat; with emphasis on problem solving. Carries no credit toward a major or minor in physics. Must be taken concurrently with PHYS 1101.

Prerequisites: MATH 1316 or MATH 2412.

PHYS 1302 General Physics II

Fundamental principles of physics, is the continuation of PHYS 1301, using algebra and trigonometry; the principles and applications of electricity and magnetism. Topics include: electrostatics, circuits, electromagnetism, waves, optics, and modern physics; with emphasis on problem solving. Carries no credit toward a major or minor in physics. Must be taken concurrently with PHYS 1102. Prerequisites: PHYS 1301 and PHYS 1101.

Prerequisites: PHYS 1301 and PHYS 1101.

TCCN: PHYS 1302

PHYS 1370 Survey of Physical Science

An introductory survey of physical science. Topics include physics (motion, forces, waves and thermodynamics), chemistry (periodic table, reactions), earth science (geology, weather, biosphere and environment) and astronomy (astronomical history, planetary astronomy, stellar astronomy and cosmology). Designed to fulfill laboratory science core curriculum requirements. Must be taken concurrently with PHYS 1170. Carries no credit towards a major or minor in physics.

TCCN: PHYS 1315

PHYS 2125 University Physics I Lab

Laboratory course to accompany PHYS 2325. Laboratory experiments reinforce theoretical principles from PHYS 2325 and place importance on scientific communication and collaboration, as well as measurement methods, data collection, uncertainty and error analysis, and preparation of laboratory reports. Must be taken concurrently with PHYS 2325.

TCCN: PHYS 2125

PHYS 2126 University Physics II Lab

Laboratory course to accompany PHYS 2326. Laboratory experiments reinforce theoretical principles from PHYS 2326 and place importance on scientific communication and collaboration, as well as measurement methods, data collection, uncertainty and error analysis, and preparation of laboratory reports. Must be taken concurrently with PHYS 2326.

TCCN: PHYS 2126

PHYS 2325 University Physics I

A calculus#based treatment of the fundamental principles and applications of classical mechanics and thermodynamics for science and engineering majors. This course is the first of a two#semester sequence in University Physics. Topics include one#, two#, and three#dimensional motion, forces and Newton's laws, momentum conservation, energy conservation, gravitation, rotational dynamics, angular momentum, fluid mechanics, waves, simple harmonic motion, and thermodynamics. Must be taken concurrently with PHYS 2125.

Prerequisites: MATH 2413 or equivalent.

TCCN: PHYS 2325

PHYS 2326 University Physics II

A calculus#based treatment of the fundamental principles and applications of electricity and magnetism for science and engineering majors. This course is a continuation of PHYS 2325. Topics include electrostatics, circuits, electromagnetism, electromagnetic waves, optics, and modern physics. Must be taken concurrently with PHYS 2126.

Prerequisites: MATH 2414 or equivalent (or concurrent enrollment therein) and PHYS 2325 and PHYS 2125.

TCCN: PHYS 2326

PHYS 3305 Optics and Wave Theory

A detailed study of optics. Topics include thin and thick lenses, the lensmaker's equation, apertures, optical machines, interference, Fresnel and Fraunhofer diffraction and polarization, the Cornu Spiral. Electromagnetic waves, geometric optics, physical optics, optical instruments, lasers and holography.

Prerequisites: PHYS 2326/PHYS 2126, MATH 2415.

PHYS 3310 Modern Physics

An introduction to the foundations of modern physics. Topics include special and general relativity, kinetic theory of matter, electromagnetic quantization, light and energy, wave-matter duality of light, the Schrodinger Equation, nuclear physics and elementary particle theory. Prerequisites: PHYS 2326/PHYS 2126; Corequisites: MATH 2415.

PHYS 3315 Classical Mechanics

Topics include kinematics of particles and particle systems in one to three dimensions, rigid body rotation, gravitation, Lagrangian and Hamiltonian dynamics, periodic motion, and small oscillations. Prerequisites: PHYS 2326/PHYS 2126 and MATH 3330.

PHYS 3320 Electromagnetic Field Theory

A mathematical treatment of the fundamentals of classical electromagnetic theory. Topics include electrodynamics, vector calculus, theory of dielectrics, magnetostatic fields, electromagnetic induction, magnetic fields of currents, and Maxwell's equations. Prerequisites: PHYS 2326/2126 and MATH 3330.

PHYS 3325 Thermodynamics

A mathematical treatment of the fundamentals of thermal physics. Topics include the concepts of temperature, equation of state, first and second laws of thermodynamics, entropy, change of phase, and thermodynamic functions. Prerequisites: PHYS 2326/2126 and MATH 2415.

PHYS 4199 Special Topics in Physics

Selected topics in physics are covered, depending on student interest. Credit will be given more than once if the topic varies. Prerequisites: Permission of instructor.

PHYS 4299 Special Topics in Physics

Selected topics in physics are covered, depending on student interest. Credit will be given more than once if the topic varies. Prerequisites: Permission of instructor.

PHYS 4305 Quantum Mechanics

A mathematical treatment of quantized physical phenomena. Topics include the wave theory of matter, the principles of superposition, probability, expectation values, coordinate representation, momentum representation, indeterminacy, Hermitian operators, angular momentum, and spin. Quantum solutions for simple barriers, potential wells, harmonic oscillator, and the hydrogen atom are presented. Prerequisites: PHYS 3310 and MATH 3330.

PHYS 4310 Advanced Modern Physics

Continuation of PHYS 3310. Topics include atomic, molecular, nuclear, statistical, solid state, laser and elementary particle physics. Prerequisites: PHYS 3310 and MATH 3330.

PHYS 4315 Mathematical Methods of Physic

A course presenting mathematical techniques used in physics and engineering. The course will survey, at a brief introductory level and from a physics perspective, numerous mathematical techniques from areas such as infinite series, integral transformation, applications of complex variables, matrices and tensors, special functions, partial differential equations, Green's functions, perturbation theory, integral equations, calculus of variations, and groups and group representations. Prerequisites: PHYS 2326/2126 and MATH 3330.

PHYS 4399 Special Topics in Physics

Selected topics in physics are covered, depending on student interest. Credit will be given more than once if the topic varies. Prerequisites: Permission of instructor.