PHYSICS

Not all courses are offered every semester. Refer to the schedule of courses for each term's specific offerings.
More Info (https://one.uf.edu/soc/)

Unless otherwise indicated in the course description, all courses at the University of Florida are taught in English, with the exception of specific foreign language courses.

Department Information

The Department of Physics is making strides toward becoming one of the premier physics departments in the United States. With active groups in astrophysics, biological physics, condensed matter/materials physics, and elementary particle physics, undergraduate and graduate students participate in cutting-edge research that prepares them for successful careers in a wide variety of fields.
Website (https://www.phys.ufl.edu/wp/)

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Curriculum

- Combination Degrees
- Physics
- Physics Minor

Courses

IDH 3931 Interdisciplinary Junior Honors 1-3 Credits
Grading Scheme: Letter Grade
Special topics restricted to those in the university-wide honors program.
Prerequisite: Honors program member.
Attributes: Satisfies 6000 Words of Writing Requirement

ISC 2400L Cross-Disciplinary Laboratory 1 3 Credits
Grading Scheme: Letter Grade
First course in a two-semester inquiry-based laboratory focusing on major themes and concepts in biology, chemistry and physics with an emphasis on their integrated applications in modern, quantitative research. Satisfies course requirements for BSC 2010L, CHM 2045L and PHY 2053L.
Prerequisite: high school algebra or equivalent. Degree-seeking students only.

ISC 2401L Cross-Disciplinary Laboratory 2 3 Credits
Grading Scheme: Letter Grade
Second course in a two-semester inquiry-based laboratory focusing on major themes and concepts in biology, chemistry and physics with an emphasis on their integrated applications in modern, quantitative research. Satisfies course requirements for BSC 2011L, CHM 2046L and PHY 2054L.
Prerequisite: ISC 2400L and MAC 1147 or equivalent;
Corequisite: BSC 2010 and CHM 2045 or CHM 2047 or CHM 2095.

ISC 3523C Research Methods 3 Credits
Grading Scheme: Letter Grade
The tools scientists use to solve scientific problems, including use of experiments to answer scientific questions, design of experiments to reduce systematic and random errors, use of statistics to interpret experimental results and deal with sampling errors, mathematical modeling of scientific phenomena and oral presentation of scientific work.
Prerequisite: UFTeach Step 1 and one year of college biology, chemistry or physics.

PHY 1033C Discovering Physics 3 Credits
Grading Scheme: Letter Grade
A description of the fundamental concepts of physics which shape a scientist's view of the laws of nature. A laboratory experience is included, which emphasizes the importance of measurement for the testing of scientific hypotheses. This course affords students the ability to critically examine and evaluate the principles of the scientific method, model construction, and use the scientific method to explain natural experiences and phenomena. (P)
Attributes: General Education - Physical Science

PHY 2004 Applied Physics 1 3 Credits
Grading Scheme: Letter Grade
Emphasizes the practical applications of basic physics to a wide range of professions including architecture, agricultural sciences, building construction, and forest resources. Mechanics of motion, forces, energy, momentum, wave motion, and heat. (P) This course affords students the ability to critically examine and evaluate the principles of the scientific method, model construction, and use the scientific method to explain natural experiences and phenomena.
Prerequisite: algebra and trigonometry.
Attributes: General Education - Physical Science

PHY 2004L Laboratory for Physics 2004 1 Credit
Grading Scheme: Letter Grade
Laboratory experience illustrating the practical applications of basic physics, including the mechanics of motion, forces, energy, momentum, wave motion and heat. This course affords students the ability to critically examine and evaluate the principles of the scientific method, model construction, and use the scientific method to explain natural experiences and phenomena.
Corequisite: PHY 2004.
Attributes: General Education - Physical Science

PHY 2005 Applied Physics 2 3 Credits
Grading Scheme: Letter Grade
Continuation of the sequence. Electric and magnetic fields. Geometrical, wave and applied optics. Modern and nuclear physics. This course affords students the ability to critically examine and evaluate the principles of the scientific method, model construction, and use the scientific method to explain natural experiences and phenomena.
Prerequisite: PHY 2004.
Attributes: General Education - Physical Science

PHY 2005L Applied Physics 2 Lab 1 Credit
Grading Scheme: Letter Grade
Laboratory experience illustrating the practical applications of electric and magnetic fields geometrical, wave and applied optics; and modern and nuclear physics. (P) corequisite: PHY 2005.This course affords students the ability to critically examine and evaluate the principles of the scientific method, model construction, and use the scientific method to explain natural experiences and phenomena.
Corequisite: PHY 2005.
Attributes: General Education - Physical Science

PHY 2020 Introduction to Principles of Physics 3 Credits
Grading Scheme: Letter Grade
This course offers a comprehensive survey of physics, covering a wide range of topics including motion, Newton's laws, energy, sound, heat, electricity, magnetism, and optics. Emphasizing a conceptual understanding of physics, the course integrates critical thinking skills and real-world applications.
Prerequisite: high school algebra and trigonometry or the equivalent.
Attributes: General Education - Physical Science

PHY 2030 Humans, Science, the Universe 3 Credits
Grading Scheme: Letter Grade
What is the universe and what is humanity’s place in it? This is one of the fundamental questions that people have always asked, and we are still asking it. This course will explore humanity’s view of terrestrial and celestial phenomena from ancient to modern times, and in parallel offer basic explanations for how science views these phenomena today. Topics include the solar system and how various civilizations and eras have conceived of its structure, light and relativity, and modern concepts of cosmology. This course affords students the ability to critically examine and evaluate the principles of the scientific method, model construction, and use the scientific method to explain natural experiences and phenomena.
Attributes: Quest 2, General Education - Physical Science

PHY 2032 Energy and Society 3 Credits
Grading Scheme: Letter Grade
Addresses the question of how the world's energy needs will be met based on available resources, technology, environmental concerns, economics, personal choices, and nation and international policy. Develops quantitative reasoning skills necessary to make informed decisions. Compares energy use, resources, and policy in different countries. This course affords students the ability to critically examine and evaluate the principles of the scientific method, model construction, and use the scientific method to explain natural experiences and phenomena.
Prerequisite: Any Quest 1 course with a minimum grade of C.
Attributes: Quest 2, General Education - International, General Education - Physical Science

PHY 2048 Physics with Calculus 1 3 Credits
Grading Scheme: Letter Grade
This calculus-based course serves as the first in a two-part series, covering topics like kinematics, dynamics, energy, momentum, rotational motion, fluid dynamics, oscillatory motion, and waves. Designed for science and engineering majors, the course integrates critical thinking, analytical skills, and real-world applications.
Prerequisite: high-school physics, PHY 2020 or the equivalent, and MAC 2311.
Corequisite: MAC 2312.
Attributes: General Education - Physical Science

PHY 2048L Laboratory for PHY 2048 1 Credit
Grading Scheme: Letter Grade
Lab for Physics with Calculus 1. This course affords students the ability to critically examine and evaluate the principles of the scientific method, model construction, and use the scientific method to explain natural experiences and phenomena.
Prerequisite: Degree-seeking students only.
Corequisite: PHY 2048 or the equivalent.
Attributes: General Education - Physical Science

PHY 2049 Physics with Calculus 2 3 Credits
Grading Scheme: Letter Grade
The second of a two-semester sequence of Physics for scientists and engineers. Content includes Coulombs law, electric fields and potentials, capacitance, currents and circuits, Amperes law, Faradays law, inductance, Maxwells equations, electromagnetic waves, ray optics, interference and diffraction. This course affords students the ability to critically examine and evaluate the principles of the scientific method, model construction, and use the scientific method to explain natural experiences and phenomena.
Prerequisite: PHY 2048 and MAC 2312;
Corequisite: MAC 2313.
Attributes: General Education - Physical Science

PHY 2049L Laboratory for PHY 2049 1 Credit
Grading Scheme: Letter Grade
Laboratory experience for PHY 2049 illustrating the practical applications of Coulomb's law, electric fields and potentials, capacitance, currents and circuits, Ampere's law, Faraday's law, inductance, Maxwell's equations, electromagnetic waves, ray optics, interference and diffraction. (P) This course affords students the ability to critically examine and evaluate the principles of the scientific method, model construction, and use the scientific method to explain natural experiences and phenomena.
Prerequisite: Degree-seeking students only.
Corequisite: PHY 2049 or the equivalent.
Attributes: General Education - Physical Science

PHY 2053 Physics 1 4 Credits
Grading Scheme: Letter Grade
This course is the first in a two-part series intended for non-physics majors, offering an algebra and trigonometry approach to topics such as kinematics, dynamics, energy, momentum, rotational motion, fluid dynamics, oscillatory motion, and waves. The course fosters analytical and critical thinking skills to promote a scientific understanding of the real world.
Prerequisite: high school algebra and trigonometry, or the equivalent. Degree-seeking students only.
Attributes: General Education - Physical Science

PHY 2053L Laboratory for PHY 2053 1 Credit
Grading Scheme: Letter Grade
Laboratory experience for PHY 2053 illustrating the practical applications of the structure and properties of matter; kinematics, dynamics and statics; momentum and energy; rotation, elasticity; vibration; fluids; temperature and expansion, heat transfer, thermal behavior of gases; wave motion and sound. (P) This course affords students the ability to critically examine and evaluate the principles of the scientific method, model construction, and use the scientific method to explain natural experiences and phenomena.
Corequisite: PHY 2053 or the equivalent. Degree-seeking students only.
Attributes: General Education - Physical Science

PHY 2054 Physics 2 4 Credits
Grading Scheme: Letter Grade
Second semester of introductory physics de-emphasizing calculus. Electric charge, field, and circuits; electromagnetism, applied electricity; geometrical optics, wave optics, applied optics; electrons and photons; atoms and nuclei. This course affords students the ability to critically examine and evaluate the principles of the scientific method, model construction, and use the scientific method to explain natural experiences and phenomena.
Prerequisite: PHY 2053 or the equivalent. Degree-seeking students only.
Attributes: General Education - Physical Science

PHY 2054L Laboratory for PHY 2054 1 Credit
Grading Scheme: Letter Grade
Laboratory experience for PHY 2054 illustrating the practical applications of electric charge, fields and circuits; electromagnetism, applied electricity; geometrical optics, wave optics, applied optics; electrons and photons; atoms and nuclei. (P) This course affords students the ability to critically examine and evaluate the principles of the scientific method, model construction, and use the scientific method to explain natural experiences and phenomena.
Corequisite: PHY 2054 or the equivalent. Degree-seeking students only.
Attributes: General Education - Physical Science

PHY 2060 Enriched Physics with Calculus 1 3 Credits
Grading Scheme: Letter Grade
First of the enriched sequence for physics majors and others wishing a deeper understanding of mechanics, kinematics, conservation laws, harmonic motion, central forces and special relativity. This course affords students the ability to critically examine and evaluate the principles of the scientific method, model construction, and use the scientific method to explain natural experiences and phenomena.
Prerequisite: Degree-seeking students only;
Corequisite: MAC 2312 or the equivalent.
Attributes: General Education - Physical Science

PHY 2061 Enriched Physics with Calculus 2 3 Credits
Grading Scheme: Letter Grade
Second course of the enriched sequence. Electricity and magnetism, including electrostatics, Gauss' law, potentials, vector analysis, Laplace's equation, conductors and insulators, circuits, magnetism, Maxwell's equations and EM fields in matter. This course affords students the ability to critically examine and evaluate the principles of the scientific method, model construction, and use the scientific method to explain natural experiences and phenomena.
Prerequisite: PHY 2060 or instructor permission;
Corequisite: MAC 2313 or the equivalent.
Attributes: General Education - Physical Science

PHY 3063 Enriched Modern Physics 3 Credits
Grading Scheme: Letter Grade
Theory of relativity and introduction to quantum theory. Course includes wave mechanics, quantum theory of solids, nuclear and particle physics and cosmology.
Prerequisite: PHY 2061 or instructor permission, and MAP 2302 or the equivalent.

PHY 3101 Introduction to Modern Physics 3 Credits
Grading Scheme: Letter Grade
Modern and atomic physics, relativity, wave phenomena and the basis of quantum physics.
Prerequisite: PHY 2049 or the equivalent.

PHY 3221 Mechanics 1 3 Credits
Grading Scheme: Letter Grade
First part of PHY 3221/4222 sequence in classical mechanics emphasizing matrices, vector calculus, Newtonian mechanics, frames of reference, conservation laws and harmonic oscillation.
Prerequisite: PHY 2049 or the equivalent;
Corequisite: MAP 2302 or the equivalent.

PHY 3323 Electromagnetism 1 3 Credits
Grading Scheme: Letter Grade
First part of the PHY 3323/4324 sequence in electromagnetism. Course covers static electric and magnetic fields, electric circuits, Maxwell's equations, radiation and propagation of electromagnetic waves.
Prerequisite: (PHY 2049 or PHY 2061, or the equivalent) or (MAP 2302 or the equivalent).

PHY 3513 Thermal Physics 1 3 Credits
Grading Scheme: Letter Grade
First part of the PHY 3513/4523 sequence that includes treatment of classical thermodynamics, including fundamental postulates, entropy and equations of states; thermodynamic equilibrium and potentials; Maxwell relations and phase transitions.
Prerequisite: PHY 2049 or PHY 2061.

PHY 3840L Building Scientific Equipment 2 Credits
Grading Scheme: Letter Grade
Hands-on experience in the mechanical fabrication of research apparatus. Topics include shop drawings, properties of materials, metal cutting (lathe and milling-machine operation) and metal joining.
Prerequisite: PHY 2061 or PHY 3101, or the equivalent.

PHY 4222 Mechanics 2 3 Credits
Grading Scheme: Letter Grade
Second part of the sequence in classical mechanics studying rigid body mechanics; motion in a non-inertial frame, Lagrangian and Hamiltonian dynamics; elements of fluid mechanics; and relativity theory.
Prerequisite: PHY 3221 and differential equations.

PHY 4324 Electromagnetism 2 3 Credits
Grading Scheme: Letter Grade
The second in the PHY 3323/4324 electromagnetism sequence studying static electric and magnetic fields, electric circuits, Maxwell's equations, radiation and propagation of electromagnetic waves.
Prerequisite: PHY 3323 and differential equations.

PHY 4424 Optics 1 3 Credits
Grading Scheme: Letter Grade
The phenomena of reflection, refraction, dispersion, interference, diffraction and polarization of light.
Prerequisite: PHY 3323 or instructor permission.

PHY 4523 Statistical Physics 3 Credits
Grading Scheme: Letter Grade
Second of the PHY 3513/4523 sequence. Introduction to statistical physics and continued study of classical thermodynamics, including fundamental postulates, entropy and equations of states; thermodynamic equilibrium and potentials; Maxwell relations and phase transitions.
Prerequisite: PHY 3513 and PHY 4604; differential equations.

PHY 4550 Cryogenics 3 Credits
Grading Scheme: Letter Grade
History of cryogenics, air separation, liquefaction of permanent gases and natural gases, and superconducting devices and electronics.
Prerequisite: PHY 3101 or the equivalent;
Corequisite: PHY 3513 or the equivalent.

PHY 4604 Introductory Quantum Mechanics 1 3 Credits
Grading Scheme: Letter Grade
First of the PHY 4604/4605 sequence. Basic concepts of quantum mechanics with applications in atomic and nuclear physics and condensed matter.
Prerequisite: (PHY 3101 or PHY 3063) and MAP 2302 or equivalent.

PHY 4605 Introductory Quantum Mechanics 2 3 Credits
Grading Scheme: Letter Grade
Second of the PHY 4604/4605 quantum mechanics sequence with applications in atomic and nuclear physics and condensed matter.
Prerequisite: PHY 4604.

PHY 4802L Laboratory Physics 1 3 Credits
Grading Scheme: Letter Grade
Electronics in the laboratory.
Corequisite: PHY 3323 or the equivalent.

PHY 4803L Laboratory Physics 2 3 Credits
Grading Scheme: Letter Grade
Current laboratory techniques.
Prerequisite: PHY 4604 and PHY 4802L.

PHY 4905 Individual Work 1-4 Credits
Grading Scheme: Letter Grade
Qualified undergraduate students study selected topics in physics.
Prerequisite: 12 credits of physics and instructor permission.

PHY 4911 Undergraduate Research in Physics 0-3 Credits
Grading Scheme: Letter Grade
Course provides firsthand, supervised research in Physics. Projects may involve inquiry, design, investigation, scholarship, discovery or application in Physics.

PHZ 3113 Introduction to Theoretical Physics 3 Credits
Grading Scheme: Letter Grade
This course expands and systematizes the treatment of standard problems previously encountered in elementary physics. Mathematical techniques are developed to study problems in thermodynamics, statistical physics, the motion of coupled oscillators and electrodynamics.
Prerequisite: MAC 2313 and PHY 2061, or instructor permission.

PHZ 4390 Introduction to Elementary Particle Physics 3 Credits
Grading Scheme: Letter Grade
History and phenomenology of particle physics, physics of the Standard Model and beyond, and particle accelerators and detectors.
Prerequisite: PHY 3101 or PHY 3063;
Corequisite: PHY 4604.

PHZ 4404 Introduction to Solid State Physics 3 Credits
Grading Scheme: Letter Grade
Atomic binding, crystalline structure, diffraction and reciprocal lattice, lattice vibration, phonons, electrons in solids, energy bands, semiconductors.
Prerequisite: PHY 4604;
Corequisite: PHY 4523.

PHZ 4710 Introduction to Biological Physics 3 Credits
Grading Scheme: Letter Grade
The physics of biological systems, including physics of proteins and nucleic acids, biomolecular motors and diffusional signaling and sensing. Important experimental tools such as magnetic resonance and synchrotron x-ray crystallography are also discussed. (WR)
Prerequisite: one year of introductory physics (PHY 2053/PHY 2054, PHY 2048/PHY 2049, or the equivalent) and one year of calculus (MAC 2311/MAC 2312, or the equivalent).
Attributes: Satisfies 2000 Words of Writing Requirement