PHYSICS

Course Search
Not all courses are offered every semester. Refer to the schedule of courses for each term’s specific offerings.
More Info

Courses
IDH 3931 Interdisciplinary Junior Honors 1-3 Credits
Special topics restricted to those in the university-wide honors program. (WR) WR6

ISC 2400L Cross-Disciplinary Laboratory 1 3 Credits
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.
Prereq: high school algebra or equivalent

ISC 2401L Cross-Disciplinary Laboratory 2 3 Credits
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.
Prereq: ISC 2400L and MAC 1147 or equivalent
Coreq: BSC 2010 and CHM 2045 or CHM 2047 or CHM 2095

ISC 3523C Research Methods 3 Credits
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.
Prereq: UF Teach Step 1 and one year of college biology, chemistry or physics

MET 1010 Introduction to Weather and Climate 3 Credits
A course for non-science students interested in understanding the phenomena of daily weather. Several principles of physics are introduced. (P)
Prereq: high school algebra
Coreq: BSC 2010 and CHM 2045 or CHM 2047 or CHM 2095

PHY 1033C Discovering Physics 3 Credits
The fundamental concepts of physics that shape a scientist’s view of the laws of nature. A laboratory experience is included to emphasize the importance of measurement for the testing of scientific hypotheses. (P)
General Education - Physical Science

PHY 2004 Applied Physics 1 3 Credits
Emphasizes the practical applications of basic physics to a range of professions, including architecture, agricultural sciences, building construction and forest resources. Mechanics of motion, forces, energy, momentum, wave motion and heat. (P)
Prereq: algebra and trigonometry
General Education - Physical Science

PHY 2004L Laboratory for Applied Physics 1 1 Credit
Laboratory experience illustrating the practical applications of basic physics, including the mechanics of motion, forces, energy, momentum, wave motion and heat. (P)
Coreq: PHY 2004
General Education - Physical Science

PHY 2005 Applied Physics 2 3 Credits
Continuation of the applied physics sequence. Electric and magnetic fields; geometrical, wave and applied optics; and modern and nuclear physics. (P)
Prereq: PHY 2004
General Education - Physical Science

PHY 2005L Laboratory for Applied Physics 2 1 Credit
Laboratory experience illustrating the practical applications of electric and magnetic fields geometrical, wave and applied optics; and modern and nuclear physics. (P)
Coreq: PHY 2005
General Education - Physical Science

PHY 2020 Introduction to Principles of Physics 3 Credits
Fundamental principles of physics in mechanics, electricity and modern physics as applied to conservation laws. An in-depth analysis of selected topics with lecture demonstration, films and other teaching aids. (P)
Prereq: high school algebra and trigonometry or the equivalent

PHY 2048 Physics with Calculus 1 3 Credits
The first of a two-semester sequence of physics for scientists and engineers. The course covers Newtonian mechanics and includes motion, vectors, Newton’s laws, work and conservation of energy, systems of particles, collisions, equilibrium, oscillations and waves. (P)
Prereq: high school physics, PHY 2020 or the equivalent, and MAC 2311
Coreq: MAC 2312
General Education - Physical Science

PHY 2048L Laboratory for Physics with Calculus 1 1 Credit
Laboratory experience forPHY 2048 illustrating the practical applications of Newtonian mechanics. (P)
Prereq: Degree-seeking students only
Coreq: PHY 2048 or the equivalent
General Education - Physical Science

PHY 2049 Physics with Calculus 2 3 Credits
The second of a two-semester sequence of physics for scientists and engineers. Content includes 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)
Prereq: PHY 2048 and MAC 2312
Coreq: MAC 2313
General Education - Physical Science

PHY 2049L Laboratory for Physics with Calculus 2 1 Credit
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)
Prereq: Degree-seeking students only
Coreq: PHY 2049 or the equivalent
General Education - Physical Science
PHY 2053 Physics 1  
First semester of introductory physics de-emphasizing calculus.  
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)  
Prereq: high school algebra and trigonometry, or the equivalent  
General Education - Physical Science  

PHY 2054 Physics 2  
Second semester of introductory physics de-emphasizing calculus.  
Electric charge, fields and circuits; electromagnetism, applied electricity;  
geometrical optics, wave optics, applied optics; electrons and photons;  
atoms and nuclei. (P)  
Prereq: PHY 2053 or the equivalent  
General Education - Physical Science  

PHY 2060 Enriched Physics with Calculus 1  
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. (P)  
Prereq: Degree-seeking students only  
Coreq: MAC 2312 or the equivalent  
General Education - Physical Science  

PHY 2061 Enriched Physics with Calculus 2  
Second course of the enriched sequence studying electricity and  
magnetism, including electrostatics, Gauss's Law, potentials, vector  
analysis, Laplace's equation, conductors and insulators, circuits,  
magnetism, Maxwell's equations and E and M fields in matter. (P)  
Prereq: PHY 2060 or instructor permission  
Coreq: MAC 2313 or the equivalent  
General Education - Physical Science  

PHY 2064L The Physical Basis of Music  
Vibration and wave behavior as applied to musical instruments; and  
studies of the generation and reception of sound waves, musical intervals  
and scales, musical acoustics and musical electronics. (P)  
Prereq: high school algebra and trigonometry, or the equivalent  
General Education - Physical Science  

PHY 2065L Laboratory for Physics 1  
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)  
Coreq: PHY 2053 or the equivalent  
General Education - Physical Science  

PHY 2066L Laboratory for Physics 2  
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)  
Prereq: PHY 2054 or the equivalent  
General Education - Physical Science  

PHY 2068L Electromagnetism Laboratory  
Practical experience covering static electric and magnetic fields, electric  
circuits, Maxwell's equations, radiation and propagation of electromagnetic  
waves. (P)  
Prereq: PHY 2049 or the equivalent  

PHY 2069L Laboratory for Physics 3  
Laboratory experience for PHY 2060 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)  
Prereq: PHY 2060 or the equivalent  
General Education - Physical Science  

PHY 2070L Laboratory for Physics 4  
Laboratory experience for PHY 2061 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)  
Prereq: PHY 2061 or the equivalent  
General Education - Physical Science  

PHY 2071L Laboratory for Physics 5  
Laboratory experience for PHY 2062 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)  
Prereq: PHY 2062 or the equivalent  
General Education - Physical Science  

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

PHY 3101 Introduction to Modern Physics  
Modern and atomic physics, relativity, wave phenomena and the basis of  
quantum physics. (P)  
Prereq: PHY 2049 or the equivalent  
General Education - Physical Science  

PHY 3221 Mechanics 1  
First part of PHY 3221/4222 sequence in classical mechanics  
emphasizing matrices, vector calculus, Newtonian mechanics, frames  
of reference, conservation laws and harmonic oscillation. (P)  
Prereq: PHY 2049 or the equivalent  
Coreq: MAP 2302 or the equivalent  
General Education - Physical Science  

PHY 3323 Electromagnetism 1  
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. (P)  
Prereq: PHY 2049 and PHY 2061, or the equivalent  

PHY 3400 Light, Color and Holography  
Demonstrations and discussion of commonly observed phenomena  
of light, color and vision, such as rainbows, sunsets, the blue sky  
and perceptual illusions. A study of the principles of holography and  
applications. (P)  
General Education - Physical Science  

PHY 3513 Thermal Physics 1  
First part of the PHY 3513/4523 sequence that includes treatment of  
classical thermodynamics, including fundamental postulates, entropy  
equations and equations of states; thermodynamic equilibrium and  
Maxwell relations and phase transitions. (P)  
Prereq: PHY 2049 or the equivalent  

PHY 3840L Building Scientific Equipment  
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.  
Prereq: PHY 2061 or PHY 3101, or the equivalent  

PHY 4222 Mechanics 2  
Second part of the sequence in classical mechanics studying rigid body  
mechanics; motion in a noninertial frame, Lagrangian and Hamiltonian  
dynamics; elements of fluid mechanics; and relativity theory.  
Prereq: PHY 3221 and differential equations  

PHY 4324 Electromagnetism 2  
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.  
Prereq: PHY 3323 and differential equations  

PHY 4424 Optics 1  
The phenomena of reflection, refraction, dispersion, interference,  
diffraction and polarization of light.  
Prereq: PHY 3323 or instructor permission
PHY 4523 Statistical Physics 3 Credits
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.
Prereq: PHY 3513 and PHY 4604

PHY 4550 Cryogenics 3 Credits
History of cryogenics, air separation, liquefaction of permanent gases and natural gases, and superconducting devices and electronics.
Prereq: PHY 3101 or the equivalent
Coreq: PHY 3513 or the equivalent

PHY 4604 Introductory Quantum Mechanics 1 3 Credits
First of the PHY 4604/4605 sequence. Basic concepts of quantum mechanics with applications in atomic and nuclear physics and condensed matter. (P)
Prereq: PHY 3101 or PHY 3063
General Education - Physical Science

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

PHY 4802L Laboratory Physics 1 3 Credits
Electronics in the laboratory.
Coreq: PHY 3323 or the equivalent

PHY 4803L Laboratory Physics 2 3 Credits
Current laboratory techniques.
Prereq: PHY 4604 and PHY 4802L

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

PHY 4911 Undergraduate Research in Physics 3 Credits
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
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.
Prereq: MAC 2313 and PHY 2061, or instructor permission

PHZ 4390 Introduction to Elementary Particle Physics 3 Credits
History and phenomenology of particle physics, physics of the Standard Model and beyond, and particle accelerators and detectors.
Prereq: PHY 3101 or PHY 3063
Coreq: PHY 4604

PHZ 4404 Introduction to Solid State Physics 3 Credits
Atomic binding, crystalline structure, diffraction and reciprocal lattice, lattice vibration, phonons, electrons in solids, energy bands, semiconductors.

PHZ 4710 Introduction to Biological physics 3 Credits
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)
Prereq: one year of introductory physics (PHY 2053/2054, PHY 2048/2049, or the equivalent) and one year of calculus (MAC 2311/2312, or the equivalent)
WR2