2025-2026 Physics Course Offerings
(Tentative Schedule)

Course Number	Units	Course Title	Prerequisites and Corequisites (Course Description)	FALL	WINTER	SPRING	SUMMER
PHYS 006	4	The Violent Universe	Prerequisite(s): none. An introduction to violent phenomena that power the universe, specifically phenomena that illustrate basic astrophysical principles. Topics include impacts in our planetary system: explosions of stars, bursts of star formation, galaxy collisions, black holes, quasars, cosmic jets, and the "Big Bang."		X		
PHYS 007	4	Space Time, Relativity, and Cosmology	Prerequisite(s): none. A non-mathematical presentation on gravity, understanding of the universe, and how present theories originated. Topics include the ancient Greeks, Galileo, Newton, the speed of light, Einstein's special and general relativity, the lifetimes of stars, supernovas, gravity waves, the Big Bang, cosmic inflation, and the multiverse			X	
PHYS 010	4	How Things Work	Prerequisite(s): none. Surveys the physical basis of modern technology emphasizing electronics and electrical devices. Topics include electro- and magneto-statics and dynamics (xerographic copiers, magnetic levitation, electrical power distribution); communication (radio, TV, computers, tape recorders, CD players); and imaging (cameras, DVD players, x rays, magnetic resonance imaging).	X			
PHYS 017	4	Linear Algebra For Physics	Prerequisite(s): MATH 010B with a grade of C- or better, MATH 046 with a grade of C- or better. This course covers the essential mathematics for quantum mechanics at the upper-division level. It applies linear algebra to finite and infinite dimensional vector spaces. Topics include: matrices, linear equations, bases, eigenvectors and eigenvalues, functions as infinite-dimensional vectors, differential operators as matrices, Fourier transforms, and eigenfunctions of common differential operators.			X	
PHYS 018	4	Energy and the Environment	Prerequisite(s): none. Covers the physics of energy (thermal, kinetic, potential, chemical, nuclear), its storage and use, primary sources of energy (fossil fuel, nuclear, wind, solar) and their relative effects on the environment. Particular emphasis on determining individual carbon footprints, physical models of global climate change and identifying pathways toward a sustainable infrastructure.		X		
PHYS 020	4	Exploring the Universe: An Adventure in Astronomy	Prerequisite(s): none. An astronomy course for non-science students. The excitement of an evolving and sometimes violent universe of stars and galaxies is explored in a descriptive manner. Here, the union of modern and ancient observations with astrophysical laws will provide a sophisticated but by no means complete picture of the universe. Special topics such as Astrology and Extraterrestrial Life will be discussed.			X	
PHYS 037	4	The Origins	Prerequisite(s): none Explores the most fundamental questions in cosmology, physics, and chemical sciences through their origins. Topics include the origin of the Universe, origin of matter, first generation of stars and galaxies, origin of chemical elements, chemistry of life, and astrobiology	X			
PHYS 039	3	Adventures in Physics	Prerequisite(s): restricted to major(s) Physics; or consent of instructor. Covers professional development including career options for physics majors and provides pathways to undergraduate research opportunities. Includes aspects of physics relevant to current social and political issues.	X			
PHYS 050	4	Introduction to Applied Data Science: A Multi-Disciplinary Approach	Prerequisite(s): none. Introduces students from different disciplines (physical, biological, engineering, finance, economy, humanities) to data science techniques and applications. Provides background knowledge in data science and prepares for a career in this field. Provides basic knowledge to continue on to more advanced topics in data science and apply it to practical problems.			X	
PHYS 002A	4	General Physics	Prerequisite(s): concurrent enrollment in PHYS 02LA; MATH 007A with a grade of C- or better or MATH 009A with a grade of C- or better or MATH 09HA with a grade of C- or better. Covers topics in classical mechanics including Newton's laws of motion in one and two dimensions; gravity; work, energy, and conservation of energy; momentum and collisions; rotational motion; and orbital motion. First part of the course covers the principles of physics underlying the biological and life sciences. Credit is awarded for one of the following PHYS 002A, PHYS 02HA, PHYS 040A, PHYS 040HA, or PHYS 041A.	X		X	X
PHYS 02LA	1	General Physics Laboratory	Prerequisite(s): concurrent enrollment in PHYS 002A; MATH 007A with a grade of C- or better or MATH 009A with a grade of C- or better or MATH 09HA with a grade of C- or better. Illustrates the experimental foundations of physics presented in PHYS 002A. Covers the basic principles of classical mechanics. Credit is awarded for one of the following PHYS 02LA or PHYS 02HLA.	X		X	X
PHYS 002B	4	General Physics	Prerequisite(s): concurrent enrollment in PHYS 02LB; MATH 007B, may be taken concurrently or MATH 009B, may be taken concurrently or MATH 09HB, may be taken concurrently; PHYS 002A with a grade of C- or better or PHYS 02HA with a grade of C- or better; PHYS 02LA with a grade of C- or better or PHYS 02HLA with a grade of C- or better. Second part of the introductory course that covers the principles of physics underlying the biological and life sciences. Topics include fluids and fluid flow; thermodynamics; mechanical oscillations; sound and light waves; geometrical optics; reflection; refraction; lens; microscopy; interference; and diffraction. Credit is awarded for one of the following PHYS 002B, PHYS 02HB, PHYS 040B, PHYS 040HB, or PHYS 041B.	X	X		X
PHYS 02LB	1	General Physics Laboratory	Prerequisite(s): concurrent enrollment in PHYS 002B; MATH 007B, may be taken concurrently or MATH 009B, may be taken concurrently or MATH 09HB, may be taken concurrently; PHYS 002A with a grade of C- or better or PHYS 02HA with a grade of C- or better; PHYS 02LA with a grade of C- or better or PHYS 02HLA with a grade of C- or better. Illustrates the experimental foundations of physics presented in PHYS 002B. Topics include fluids and fluid flow; thermodynamics; mechanical oscillations; sound and light waves; geometrical optics; reflection; refraction; lens; microscopy; interference; and diffraction. Credit is awarded for one of the following PHYS 02LB or PHYS 02HLB.	X	X		X
PHYS 002C	4	General Physics	Prerequisite(s): concurrent enrollment in PHYS 02LC; PHYS 002B with a grade of C- or better or PHYS 02HB with a grade of C- or better; PHYS 02LB with a grade of C- or better or PHYS 02HLB with a grade of C- or better. Third part of an introductory course covering the principles of physics underlying the biological and life sciences. Topics include electromagnetism, quantum physics, and Coulomb's Law. Covers electric field, electrical potential, resistors, capacitors, simple circuits, magnetic forces and Faraday's Law. Also addresses basic quantum physics of light, atoms, and radioactivity. Credit is awarded for one of the following PHYS 002C, PHYS 02HC, PHYS 040C, PHYS 040HC, or PHYS 041C.		X	X	X

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PHYS 02LC	1	General Physics Laboratory	Prerequisite(s): concurrent enrollment in PHYS 002C; PHYS 002B with a grade of C- or better or PHYS 02HB with a grade of C- or better; PHYS 02LB with a grade of C- or better or PHYS 02HLB with a grade of C- or better. Illustrates the experimental foundations of physics presented in PHYS 002C. Topics include electromagnetism, quantum physics, and Coulomb's Law. Covers electric field, electrical potential, resistors, capacitors, simple circuits, magnetic forces, Faraday's Law. Also addresses basic quantum physics of light, atoms, and radioactivity. Credit is awarded for one of the following PHYS 02LC or PHYS 02HLC.		X	X	X
PHYS 040A	5	General Physics	Prerequisite(s): MATH 007A with a grade of C- or better or MATH 009A with a grade of C- or better or MATH 09HA with a grade of C- or better; MATH 007B with a grade of C- or better, may be taken concurrently or MATH 009B with a grade of C- or better, may be taken concurrently or MATH 09HB with a grade of C- or better, may be taken concurrently. Explores topics in classical mechanics with gravity including Newton's laws of motion; gravity; friction; circular motion; work, energy, and conservation of energy; collisions; rigid-body motion; torque; and angular momentum. Provides laboratory exercises illustrating experimental foundations of physical principles and selected applications. For engineering and physical science majors. Credit is awarded for one of the following PHYS 040A, PHYS 002A, PHYS 02HA, PHYS 040HA, or PHYS 041A.	X	X		X
PHYS 040B	5	General Physics	Prerequisite(s): MATH 009C with a grade of C- or better, may be taken concurrently or MATH 09HC with a grade of C- or better, may be taken concurrently; PHYS 040A with a grade of C- or better or PHYS 040HA with a grade of C- or better. Topics include fluids; mechanical oscillations; sound waves and light waves; ray optics; temperature; heat; kinetic theory of gases; the laws of thermodynamics; and heat engines. Provides laboratory exercises illustrating the experimental foundations of physical principles and selected applications. For engineering and physical science majors. Credit is awarded for one of the following PHYS 040B, PHYS 002B, PHYS 02HB, PHYS 040HB, or PHYS 041B.		X		X
PHYS 040C	5	General Physics	Prerequisite(s): MATH 009C with a grade of C- or better or MATH 09HC with a grade of C- or better; PHYS 040B with a grade of C- or better or PHYS 040HB with a grade of C- or better. Covers electromagnetism and a brief introduction to applications-based quantum physics. Topics include electric force, fields, potential; Gauss' law; magnetic fields; Ampere's law; Faraday's law; electromagnetic waves; dc circuits; concept of photon, matter waves, energy levels, and radioactivity. Laboratory exercises illustrate experimental foundations and applications. For engineering and physical science majors. Credit is awarded for one of the following PHYS 040C, PHYS 002C, PHYS 02HC, PHYS 040HC, or PHYS 041C.	X		X	X
PHYS 041A	8	Introductory Physics For Physics Majors	Prerequisite(s): MATH 007A or MATH 009A or MATH 09HA with a grade of "C-" or better (MATH 007A or MATH 009A or MATH 09HA may be taken concurrently). Covers topics in classical mechanics, including Newton's laws of motion in one and two dimensions; work, energy, and conservation of energy; momentum and collisions; rotational motion; and orbital motion. Credit is not awarded for PHYS 041A if it has already been awarded for PHYS 040A, PHYS 040HA, PHYS 002A, or PHYS 02HA	X			
PHYS 041B	8	Introductory Physics For Physics Majors	Prerequisite(s): MATH 007B or MATH 009B or MATH 09HB with a grade of "C-" or better (MATH 007B or MATH 009B or MATH 09HB may be taken concurrently); PHYS 002A with a grade of "B-" or better or PHYS 040A with a grade of "C-" or better or PHYS 041A with a grade of "C-" or better or consent of instructor. Covers relativity oscillations, mechanical waves, fluids, electrostatics, magnetism, and circuits. Credit is not awarded for PHYS 041B if it has already been awarded for PHYS 040C.		X		
PHYS 041C	8	Introductory Physics For Physics Majors	Prerequisite(s): MATH 009C with a grade of "C-" or better or MATH 09HC with a grade of "C-" or better (MATH 009C or MATH 09HC may be taken concurrently); PHYS 002B or PHYS 02HB with a grade of "B-" or better or PHYS 040C or PHYS 040HC with a grade of "C-" or better or PHYS 041B with a grade of "C-" or better or consent of instructor. Covers electromagnetism, geometric and wave optics, and modern physics. Credit is not awarded for PHYS 041C if it has already been awarded for both PHYS 040D and PHYS 040E.			X	
PHYS 111	4	Astrophysics and Stellar Astronomy	Prerequisite(s): MATH 010B, MATH 046, or equivalents; one of the following: PHYS 040D with a grade of C- or better, PHYS 041C with a grade of C- or better, PHYS 002C with a grade of B- or better. Covers stellar interiors, radiations, and evolution; the origin of the elements; particle and electromagnetic radiation; pulsars, quasars, and other unusual objects; and galactic structure and cosmology	X			
PHYS 112	4	Galaxies and Extragalactic Astronomy	Prerequisite(s): PHYS 111 with a grade of C- or better. Topics include the structure of the Milky Way, the observed properties of galaxies, active galactic nuclei and supermassive black holes, the intergalactic medium, the theory of galaxy formation and evolution, galaxy clusters, and the large scale structure of our universe.		X		
PHYS 130A	4	Classical Mechanics	Prerequisite(s): MATH 009C, MATH 010A (may be taken concurrently); one of the following: PHYS 002A or PHYS 02HA with a grade of B- or better, PHYS 040A or PHYS 040HA with a grade of C- or better, PHYS 041A with a grade of C- or better. Explores vector calculus, single particle motion, oscillations, Lagrangian and Hamiltonian dynamics, central-forces motion, and celestial mechanics.	X			
PHYS 130B	4	Classical Mechanics	Prerequisite(s): MATH 010A, MATH 010B (may be taken concurrently), PHYS 130A. Topics include dynamics of a system of particles, motion in non-inertial reference systems, dynamics of rigid bodies, coupled oscillations, and special theory of relativity.			X	
PHYS 132	4	Thermal Physics	Prerequisite(s): MATH 010B; MATH 046 (may be taken concurrently); PHYS 130B. Covers thermodynamics and an introduction to statistical mechanics. Topics include states of a model system; entropy and temperature; the Boltzmann distribution and Helmholtz free energy; thermal radiation and the Planck distribution; chemical potential; the ideal gas; Fermi and Bose gasses; and heat and work.			X	
PHYS 133	4	Advanced Statistical Physics	Prerequisite(s): PHYS 132 and PHYS 156B. Covers advanced topics in statistical mechanics, ensembles, and classical and quantum statistical mechanics. Explores the connection between statistical mechanics and thermodynamics.			X	
PHYS 135A	4	Electromagnetism	Prerequisite(s): MATH 010B; MATH 046; one of the following: PHYS 002B or PHYS 02HB with B- or better, PHYS 040C or PHYS 040HC with a C- or better, PHYS 041B with a C- or better. Topics include vector calculus; Coulomb's law and the electric field; Gauss' law; scalar potential; conductors in electrostatic fields; electrostatic energy; electric multipoles; boundary conditions; electrostatics in the presence of matter; and special methods in electrostatics.	X			
PHYS 135B	4	Electromagnetism	Prerequisite(s): PHYS 135A. Topics include electric currents and circuits, Ampere's law, the magnetic field, the integral form of Ampere's law, the vector potential, Faraday's law of induction, magnetic energy, magnetic multipoles, magnetism in the presence of matter, Maxwell's equations, and plane waves.		X		

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PHYS 136	4	Electromagnetic Waves	Prerequisite(s): PHYS 135B. Covers Maxwell's equations; propagation of electromagnetic waves in wave guides, coaxial lines, and optical fibers; reflection, refraction, and diffraction of waves; dispersion of waves in gases and plasmas; interference and coherence and their role in holography; electromagnetic radiation from charged particles, antennas, masers, and lasers; and relativistic electrodynamics.			X	
PHYS 139L	5	Electronics For Scientists	Prerequisite(s): One of the following: PHYS 002B or PHYS 02HB with B- or better, PHYS 040C or PHYS 040HC with a C- or better, PHYS 041B with a C- or better, or consent of instructor. Introduces basic analog and digital circuit designs that emphasize practical applications. Includes properties of diodes and transistors; operational amplifiers for use as amplifiers, oscillators, and function generators; properties and use of logic gates, counters, and timers; data storage and synchronization; multiplexer and decoder applications; microprocessor functions; and computer interfacing.	X		X	
PHYS 140L	4	Techniques of Observational Astronomy	Prerequisite(s): PHYS 002C with a grade of B- or better or PHYS 02HC with a grade of B- or better or PHYS 040E with a grade of C- or better or PHYS 041C with a grade of C or better; restricted to major(s) Physics; or consent of instructor. Covers modern techniques of observational astronomy including digital optical imaging, photometry, spectroscopy, radio observations, error propagation and statistical inference. Lab practicum includes calibrating digital images and spectra, computer programming for data analysis, quantifying uncertainties in astronomical measurements, and written communication of scientific results.	X			
PHYS 142W	5	Advanced Physics Laboratory	Prerequisite(s): ENGL 001B with a grade of C or better; PHYS 002C with a grade of B- or better or PHYS 02HC with a grade of B- or better or PHYS 040E with a grade of C- or better or PHYS 041C with a grade of C- or better; ENGL 007, may be taken concurrently; for concurrent enrollment in ENGL 007, review the course titles or topics in the current online Schedule of Classes to find the corresponding ENGL 007 writing workshop; restricted to class level standing of senior; or consent of instructor. A capstone experience consisting of experiments chosen from areas in contemporary physics. Includes writing instruction with an emphasis on technical communication. Fulfills the third quarter writing requirement for students who earn a grade of "C" or better for courses that the Academic Senate designates, and that the student's college permits, as alternatives to English 001C. Course is repeatable to a maximum of 10 units. Credit is awarded to a maximum of 10 units for either or both PHYS 142L or PHYS 142W.	X	X	X	
PHYS 142L	4	Advanced Physics Laboratory	Prerequisite(s): PHYS 002C with a grade of B- or better or PHYS 02HC with a grade of B- or better or PHYS 040E with a grade of C- or better or PHYS 41C with a grade of C- or better; restricted to class level standing of senior; restricted to major(s) Physics; or consent of instructor. A capstone experience consisting of experiments chosen from areas in contemporary physics. Course is repeatable to a maximum of 8 units. Credit is awarded to a maximum of 10 units for either or both PHYS 142L and/or PHYS 142W.			X	
PHYS 150A	4	Introduction to Condensed Matter Physics	Prerequisite(s): One of the following: PHYS 002B with B- or better, PHYS 040E with a C- or better, PHYS 041C with a C- or better; or consent of instructor. Covers properties of systems composed of many atoms arranged in a periodic lattice. Topics include crystal structure, symmetry, and diffraction; crystal cohesion; lattice dynamics; thermal properties; metallic properties and the Fermi surface; band theory of metals and semiconductors; and collective excitations.	X			
PHYS 150B	4	Introduction to Condensed Matter Physics	Prerequisite(s): PHYS 150A. Covers properties of systems composed of many atoms arranged in a periodic lattice. Topics include superconductivity; magnetism; non-crystalline solids; defects in solids; surface and interface physics; and alloys.			X	
PHYS 156A	4	Quantum Mechanics	Prerequisite(s): MATH 010B, MATH 046, PHYS 130B; one of the following: PHYS 002C or PHYS 02HC with a grade of "B-" or better, PHYS 040E with a grade of "C-" or better, PHYS 041C with a grade of "C-" or better. Topics include wave-particle duality, the Schrodinger equation, superposition, the uncertainty principle, and one-dimensional harmonic oscillator.	X			
PHYS 156B	4	Quantum Mechanics	Prerequisite(s): PHYS 156A. Topics include the hydrogen atom, angular momentum and spin representations, many-electron systems, the Pauli exclusion principle, and perturbation theory.			X	
PHYS 156C	4	Quantum Mechanics	Prerequisite(s): PHYS 156B. Applications in quantum mechanics. Includes perturbation theory and other approximations, scattering, and an introduction to advanced topics such as relativistic quantum mechanics.			X	
PHYS 164	4	Introduction to Nuclear Physics	Prerequisite(s): One of the following: PHYS 002C or PHYS 02HC with a grade of "B-" or better, PHYS 040E with a grade of "C-" or better, PHYS 041C with a grade of "C-" or better. Addresses the basic nuclear properties, as well as the nuclear building blocks and structure. Explores radioactivity, nuclear interactions, the strong force, the confinement and chiral phase transitions, the quantum chromodynamics (QCD) vacuum, and matter at extreme temperatures and densities.			X	
PHYS 166	4	Cosmology	Prerequisite(s): PHYS 156A. Discusses current topics in astrophysics and cosmology from the perspective of elementary particle physics. Topics include the development and structure of the early universe, dark matter and dark energy, cosmic radiation, and particle physics in the stars.			X	
PHYS 177	4	Computational Methods For Physical Sciences	Prerequisite(s): CS 009A or CS 010A or CS 010B; PHYS 002C with a grade of B- or better or PHYS 02HC with a grade of B or better or PHYS 040E with a grade of C- or better or PHYS 041C with a grade of C- or better; or consent of instructor. Covers computer applications for solving problems in physical sciences. Addresses symbolic manipulation languages such as Mathematica, mathematical operations, plotting, and symbolic and numerical techniques in calculus. Includes numerical methods such as histogramming, the Monte-Carlo method for modeling experiments, statistical analysis, curve fitting, and numerical algorithms.			X	

PHYS for Non PHYS Majors	Lower Division Introduction to PHYS	Upper Division Requirement	Upper Division Electives