

PHYSICS (PHY)

PHY 1024 - Exploring Majoring in Physics (1 Credits)

Students will be introduced to the exciting field of physics, especially current topics of interest in physics research. Students will be mentored on how to succeed in physics and the many opportunities available to physics majors.

PHY 2020 - Conceptual Physics (3 Credits)

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.

Attribute(s): GENA - Gen. Ed -Natural Sci., Gen. Ed -Natural Sci., SCIQ - Scientific Inquiry, Scientific Inquiry

PHY 2048 - General Physics I (3 Credits)

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(s): MAC 2311

Corequisite(s): PHY 2048L

Attribute(s): BIOE - Biology Elective, CRIT - GE Critical Think Competency, GE Critical Think Competency, GENA - Gen. Ed -Natural Sci., Gen. Ed - Natural Sci., SCIQ - Scientific Inquiry, Scientific Inquiry

PHY 2048L - General Physics I Laboratory (1 Credits)

Laboratory experience for PHY 2048 illustrating the practical applications of Newtonian mechanics.

Prerequisite(s): MAC 2311

Corequisite(s): PHY 2048

Attribute(s): BIOE - Biology Elective, CRIT - GE Critical Think Competency, GE Critical Think Competency, GENL - Gen. Ed -Science Lab, Gen. Ed - Science Lab, SCIQ - Scientific Inquiry, Scientific Inquiry

PHY 2049 - General Physics II (3 Credits)

Second semester of a calculus-based two semester sequence of general physics (mechanics, wave motion, sound, thermodynamics, geometrical and physical optics, electricity and magnetism) for science, mathematics, and engineering students

Prerequisite(s): MAC 2312 and (PHY 2048C or (PHY 2048 and PHY 2048L))

Corequisite(s): PHY 2049L

Attribute(s): BIOE - Biology Elective, CRIT - GE Critical Think Competency, GE Critical Think Competency, GENA - Gen. Ed -Natural Sci., Gen. Ed - Natural Sci., SCIQ - Scientific Inquiry, Scientific Inquiry

PHY 2049L - General Physics II Laboratory (1 Credits)

Laboratory experience for PHY 2049 illustrating the practical applications of electricity, magnetism and optics.

Prerequisite(s): MAC 2312 and (PHY 2048C or (PHY 2048 and PHY 2048L))

Corequisite(s): PHY 2049

Attribute(s): BIOE - Biology Elective, CRIT - GE Critical Think Competency, GE Critical Think Competency, GENL - Gen. Ed -Science Lab, Gen. Ed - Science Lab, SCIQ - Scientific Inquiry, Scientific Inquiry

PHY 2053 - College Physics I (3 Credits)

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. The curriculum is inquiry based and fully integrated with laboratory and/or field experiences which emphasize active learning strategies.

Prerequisite(s): MAC 1147 or MAC 2311 or SAT Math Score with a score of 650 or MATH SECTION SCORE with a score of 670 or ACT Math with a score of 29 or Accuplacer Coll. Math Subscore with a score of 87

Corequisite(s): PHY 2053L

Attribute(s): BIOE - Biology Elective, CRIT - GE Critical Think Competency, GE Critical Think Competency, GENA - Gen. Ed -Natural Sci., Gen. Ed - Natural Sci., SCIQ - Scientific Inquiry, Scientific Inquiry

PHY 2053L - College Physics I Laboratory (1 Credits)

Laboratory experience for PHY 2053 illustrating the practical applications of Newtonian mechanics.

Prerequisite(s): MAC 1147 or MAC 2311 or SAT Math Score with a score of 650 or MATH SECTION SCORE with a score of 670 or ACT Math with a score of 29 or Accuplacer Coll. Math Subscore with a score of 87

Corequisite(s): PHY 2053

Attribute(s): BIOE - Biology Elective, CRIT - GE Critical Think Competency, GE Critical Think Competency, GENL - Gen. Ed -Science Lab, Gen. Ed - Science Lab, SCIQ - Scientific Inquiry, Scientific Inquiry

PHY 2054 - College Physics II (3 Credits)

Students continue their study of the nature of the physical world in this course. Principles of electricity and magnetism, light and modern physics will be investigated.

Prerequisite(s): PHY 2053C or (PHY 2053 and PHY 2053L)

Corequisite(s): PHY 2054L

Attribute(s): BIOE - Biology Elective, CRIT - GE Critical Think Competency, GE Critical Think Competency, GENA - Gen. Ed -Natural Sci., Gen. Ed - Natural Sci., SCIQ - Scientific Inquiry, Scientific Inquiry

PHY 2054L - College Physics II Laboratory (1 Credits)

Laboratory experience for PHY 2054 illustrating the practical applications of electricity, magnetism and optics.

Prerequisite(s): PHY 2053C or (PHY 2053 and PHY 2053L)

Corequisite(s): PHY 2054

Attribute(s): BIOE - Biology Elective, CRIT - GE Critical Think Competency, GE Critical Think Competency, GENL - Gen. Ed -Science Lab, Gen. Ed - Science Lab, SCIQ - Scientific Inquiry, Scientific Inquiry

PHY 3101 - Intro. to Modern Physics (3 Credits)

The topics we cover in this course include special relativity, interaction of radiation with matter, particle-wave duality, atomic and x-ray spectra, Bohr model of atom, Schrodinger wave equation, and introduction to solid state Physics.

Prerequisite(s): PHY 2049C or (PHY 2049 and PHY 2049L)

PHY 3221 - Intermediate Mechanics (4 Credits)

Classical Mechanics, Laws of Newton, Particles, LaGrangian, and Hamiltonian formalisms.

Prerequisite(s): PHY 2048C or (PHY 2048 and PHY 2048L)

PHY 3323 - Electricity and Magnetism I (3 Credits)

Investigation of static properties of electric and magnetic fields. Electrostatic fields and potentials, dielectrics, classical conductivity, RC circuits, Fourier and finite element methods are discussed.

Prerequisite(s): (PHY 2049C) or (PHY 2049 and PHY 2049L)

PHY 3513 - Thermal-Statistical Physics (3 Credits)

The topics we cover in this course include Thermodynamics, Kinetic Theory, and elements of Statistical Mechanics.

Prerequisite(s): PHY 2049C or (PHY 2049 and PHY 2049L)

PHY 3940 - Internship in Physics (1-4 Credits)

An internship provides the student with an opportunity to work on a project in a laboratory or classroom setting. If this work is completed off-campus the student must work with a qualified supervisor at the site as well as a faculty mentor. Goals and objectives will be planned by the student, faculty mentor, and the off-campus supervisor when applicable.

Prerequisite(s): PHY 2049C or (PHY 2049 and PHY 2049L)

Attribute(s): WBLI - Work based learning indicator

PHY 4151C - Computational Physics (4 Credits)

The topics we cover in this course include computer applications in Physics, numerical modeling and simulations of Physics processes using linear Algebra, and differential equations and Monte Carlo methods.

Prerequisite(s): PHY 2049C or (PHY 2049 and PHY 2049L)

PHY 4604 - Introduction to Quantum Theory (3 Credits)

The topics we cover in this course include Quantum Mechanics and its applications to particles, nuclei, atoms, molecules, and condensed matter.

Prerequisite(s): PHY 2049C or (PHY 2049 and PHY 2049L)

PHY 4821L - Advanced Physics Laboratory (2 Credits)

Advanced laboratory topics are treated. Modern physics laboratory equipment is used and the student is introduced to current laboratory practice.

Prerequisite(s): PHY 2049C or (PHY 2049 and PHY 2049L)

PHY 4905 - Directed Independent Study (1-3 Credits)

Individual Study under the direction of a faculty mentor. Topic will be selected based on mutual agreement between the student and the faculty member.

Prerequisite(s): PHY 2048C or (PHY 2048 and PHY 2048L)

PHY 4910 - Directed Independent Research (1-3 Credits)

Individual research under the direction of a faculty mentor. Topic will be selected based on mutual agreement between the student and the faculty member.

Prerequisite(s): PHY 2048C or (PHY 2048 and PHY 2048L)

PHY 4911 - Senior Project in Physics (3 Credits)

Students develop and work on a research project under the supervision of a faculty mentor. Students are encouraged to take primary responsibility for projects.

Prerequisite(s): PHY 3101

PHY 4930 - Special Topics in Physics (3 Credits)

Special sessions exploring the current issues in physics. Topics may vary and are selected on the basis of what is new or currently relevant in the field.

Prerequisite(s): PHY 2048C or (PHY 2048 and PHY 2048L)

PHY 4949 - Senior Capstone in Physics (3 Credits)

Students research an approved physics topic using current scientific literature and present their results. Physics content knowledge from earlier courses is reviewed and proficiency is evaluated.

Prerequisite(s): PHY 3101

PHY 4950 - Senior Project Presentation (1 Credits)

Students create a research report following the guidelines outlined by their faculty mentor. Students will present the research project at a venue determined by their faculty mentor.

Prerequisite(s): PHY 4911