PHYSICS (PHYS)

PHYS 107. Introductory Physics I. (4 Credits)
An introduction into the concepts and methods of scientific inquiry illustrated using elements of classical mechanics complemented with laboratory experiments. Topics include translational and rotational motions of particles and rigid bodies, analyzed using simple algebra-based Newtonian kinematics, dynamics and statics, and conservation of energy and momentum. Pre- or Co-requisite: MATH 102 or equivalent 4 credits (3 lecture hours, 2 laboratory hours) This course satisfies the Liberal Arts and Sciences requirement and the SUNY General Education Requirement for Natural Science

PHYS 108. Introductory Physics II. (4 Credits)
An introduction into the concepts and methods of scientific inquiry illustrated using fundamentals of thermal physics and classical electromagnetism complemented with laboratory experiments. It includes a survey of thermodynamic variables and laws applied to ideal-gas processes and phase changes in matter. Also, it discusses electromagnetic interactions and fields exemplified using charge statics and dynamics, simple elements of electric circuits, and an excursion into the nature of light. Prerequisite: PHYS 107 or permission of instructor 4 credits (3 lecture hours, 2 laboratory hours) This course satisfies the Liberal Arts and Sciences requirement and the SUNY General Education Requirement for Natural Science

PHYS 127. General Physics I. (4 Credits)
The first of two general-level survey courses in Physics, with an emphasis on analysis using algebra and trigonometry. Topics include: physical units and dimensions, vectors, kinematics, Newton's laws, potential and kinetic energy, circular motion, linear and angular momentum, and rigid body motion. Pre- or Co-requisite: MATH 103 or equivalent 4 credits (3 lecture hours, 2 laboratory hours), fall semester This course satisfies the Liberal Arts and Sciences requirement and the SUNY General Education Requirement for Natural Science

PHYS 128. General Physics II. (4 Credits)
The second of two general-level survey courses in Physics, with an emphasis on analysis using algebra and trigonometry. Topics include: concepts of heat, work, internal energy, heat transfer, and the first and second laws of thermodynamics. Simple harmonic motion, wave motion, harmonic waves, and superposition. Topics in electromagnetism. Properties of light include reflection, refraction, interference, diffraction, polarization, the electromagnetic spectrum, and optical instruments. Prerequisite: PHYS 127 or permission of instructor 4 credits (3 lecture hours, 2 laboratory hours), spring semester This course satisfies the Liberal Arts and Sciences requirement and the SUNY General Education Requirement for Natural Science

PHYS 154. Univ Physics I (Mechanics). (4 Credits)
This course is a calculus-based introductory survey of classical mechanics. It presents translational, rotational and vibrational motion of particles and rigid bodies based on Newtonian kinematics and dynamics, and on the laws of energy and momentum conservation. Pre- or Co-requisite: MATH 161 or equivalent 4 credits (3 lecture hours, 2 laboratory hours), spring semester This course satisfies the Liberal Arts and Sciences requirement and the SUNY General Education Requirement for Natural Science

PHYS 155. Univ Physics II(Elec & Magnet). (4 Credits)
This course is a calculus-based introduction into the classical theories of electricity and magnetism with applications to electrical components and circuits. It surveys concepts such as the intertwined nature of electric and magnetic fields, classical laws and models culminating with Maxwell's equations of electromagnetism, and devices including capacitors, resistors and inductors combined into simple dc and ac-circuits. Prerequisite: PHYS 154 Pre- or Co-requisite: MATH 162 or equivalent 4 credits (3 lecture hours, 2 laboratory hours), fall semester This course satisfies the Liberal Arts and Sciences requirement and the SUNY General Education Requirement for Natural Science

PHYS 158. Univ Physics II(Elec & Magnet). (4 Credits)
Theoretical basis of electricity and magnetism with applications to circuits and electrical instruments. Coulomb's law, the electric field, potential, Gauss' law, electromotive force, capacitance, Kirchhoff's laws, the magnetic field, Ampere's law, induced fields, magnetic properties of matter, mutual and self-inductance, AC circuits. Finishes with an overview of Maxwell's equations and electromagnetic waves. Prerequisite: PHYS 157 Pre- or Co-requisite: MATH 162 4 credits (3 lecture hours, 3 laboratory hours), fall semester This course satisfies the Liberal Arts and Sciences requirement and the SUNY General Education Requirement for Natural Science

PHYS 168. Univ Physics II(Elec & Magnet). (4 Credits)
Theoretical basis of electricity and magnetism with applications to circuits and electrical instruments. Coulomb's law, the electric field, potential, Gauss' law, electromotive force, capacitance, Kirchhoff's laws, the magnetic field, Ampere's law, induced fields, magnetic properties of matter, mutual and self-inductance, AC circuits. Finishes with an overview of Maxwell's equations and electromagnetic waves. Prerequisite: PHYS 157 or 167 Pre- or Co-requisite: MATH 162 4 credits (3 lecture hours, 3 laboratory hours), fall semester This course satisfies the Liberal Arts and Sciences requirement and the SUNY General Education Requirement for Natural Science

PHYS 254. Univ PhysicsIII(Sound, Thermo). (4 Credits)
This course is an introduction into the theory and applications of acoustics and classical thermodynamics. The sound part is an illustration of mechanical wave characterization, production, propagation and detection. The topics of thermodynamics include a classical interpretation of the thermal properties of matter at macroscopic and microscopic scales, a survey of thermal processes and the laws of thermodynamics, and their applications to simple heat machines. Prerequisite: PHYS 154, 155 Pre- or Co-requisite: MATH 261 or equivalent 4 credits (3 lecture hours, 2 laboratory hours), spring semester This course satisfies the Liberal Arts and Sciences requirement and the SUNY General Education Requirement for Natural Science

PHYS 255. Physics IV (Modern & Optics). (4 Credits)
This course is an introductory exploration of increasingly explanatory theories of light and matter, from classical optics to modern physics and cosmology. The discussion of optics includes concepts and applications of ray optics (reflection, refraction and image formation) and wave optics (interference, diffraction and polarization). The survey of modern physics includes elements of relativity and quantum mechanics applied to the study of matter in atomic, nuclear, molecular and solid state physics. Prerequisite: PHYS 154, 155 Pre- or Co-requisite: MATH 262 or equivalent 4 credits (3 lecture hours, 2 laboratory hours), spring semester This course satisfies the Liberal Arts and Sciences requirement and the SUNY General Education Requirement for Natural Science