PHYSICS (PHY)

PHY 101 College Physics I (0-4 credits)
This is the first half of an algebra-based physics course designed for students who wish to take physics but may not have the calculus background required for PHY 111/112. The first half covers Newtonian mechanics, fluis mechanics, oscillations, and mechanical waves and sound. The second half covers electricity, magnetism, thermodynamics, optics, and selected topics in modern physics.
Course Rotation: Fall

PHY 102 College Physics II (0-4 credits)
This is the second half of an algebra-based physics course designed for students who wish to take physics but may not have the calculus background required for PHY 111/112. The first half covers Newtonian mechanics, fluids mechanics, oscillations, and mechanical waves and sound. The second half covers electricity, magnetism, thermodynamics, optics, and selected topics in modern physics.
Course Rotation: Spring

PHY 105 Circuit Theory and Electronics (0-2 credits)

PHY 106 Physics for Telecommunications (4 credits)

PHY 109 Digital Electronics Systems (0-4 credits)
An introduction to the logical principles and devices that make modern computers and other electronic systems possible. The course will cover switching devices, switching algebra, logic design, minimization techniques, reliability design, synchronous sequential circuits, and sequential machines. Laboratory exercises will supplement lecture material.
Course Rotation: Fall, Spring, and Summer.

Prerequisites: An introductory computer course.

PHY 111 General Physics I (0-4 credits)
Basic calculus-level course in physics treating mechanics and thermodynamics. Laboratory illustrates the physical principles discussed. There will be a mandatory recitation hour to accompany the three-hour lecture (not applicable during Summer terms when course is offered on the NYC campus).
Course Rotation: NYC and PLV: Fall, Spring, and Summer.

PHY 111A General Physics I (Lecture) (3 credits)
Basic calculus-level course in physics treating mechanics and thermodynamics.
Prerequisites: MAT 131. Open only to students enrolled at other colleges requiring lecture only. Consult the Physics department for registration procedure.

PHY 111B General Physics I (Laboratory) (1 credits)
Prerequisites: Open only to students enrolled at other colleges requiring lab only. Consult the Physics department for registration procedure.

PHY 111D Physics Discussion Group (0 credits)

PHY 111R General Physics I Recitation (0 credits)
One-hour recitation course for students registered into PHY 111, General Physics I.
Course Rotation: NY and PL: Fall, Spring, and Summer.

PHY 112 General Physics II (0-4 credits)
A continuation of Physics I including wave motion, electromagnetism, optics, and an introduction to modern physics. Laboratory illustrates the physical principles discussed. There will be a mandatory recitation hour to accompany the three-hour lecture.
Course Rotation: NYC: Spring and Summer. PLV: Fall, Spring, and Summer.

PHY 112A General Physics II (Lecture) (3 credits)
A continuation of Physics I including wave motion, electromagnetism, optics, and an introduction to modern physics. Laboratory illustrates the physical principles discussed.
Prerequisites: Open only to students enrolled at other colleges requiring Lecture only. Consult the Physics department for registration procedure.

PHY 112B General Physics II (Laboratory) (1 credits)
Laboratory illustrates the physical principles discussed.
Prerequisites: Open only to students enrolled at other colleges requiring Lab only. Consult the Physics department for registration procedure.

PHY 112D Physics II Discussion Group (0 credits)
This is a peer lead homework help group for students taking PHY 112.
Course Rotation: NY:PLV;Fall:Spring.

PHY 112R General Physics II Recitation (0 credits)
One-hour recitation course for students registered into PHY 112, General Physics II.
Course Rotation: NY and PL: Fall, Spring, and Summer.

PHY 120 Physics of Movement (0-3 credits)
Dancers employ the rules of physics in movement; this course is designed to establish scientific connections for the dancer that will make learning physics applicable to their everyday activities in the studio. By combining the laws of physics with the beauty of dance students will achieve a complete understanding of the scientific attributes behind physical activity and movement giving them a unique insight that will prepare them as professional dancers, teachers, and artists.
Course Rotation: : Fall>

PHY 199M Topics: Electrical Circuits II (0-3 credits)

PHY 199N Topic: Technology (3 credits)

PHY 199S Special Topics in Physics : Optics (3 credits)

PHY 200 Mechanics (4 credits)

PHY 201 Electrical Circuits (0-3 credits)
Elementary electrical concepts. Resistive networks-mesh and node analysis. Dependent sources. Network theorems. Energy storage elements. Simple RC and RL circuits. Sinusoidal excitation and phasors. Alternating current steady-state analysis and power. Polyphase circuits. Computer-aided solutions.
Course Rotation: PLV: Fall - Odd years.

PHY 202 Electrical Circuits II (0-3 credits)
This course presents a study of A.C. circuits including power relationships in the A.C. steady state, polyphase circuits complex frequency, poles and zeros, resonance, two port networks, inductance and transformers and Fourier series.
Course Rotation: PLV: Spring - Even years.

PHY 210 Analog/Digital Systems (0-4 credits)
This course begins with a comprehensive review of digital electronics. Basic analog devices are then introduced--the diode, bipolar transistor, and field effect transistor. Operational amplifiers are demonstrated--inverting, noninverting amplifiers, voltage followers, summers and subtractors, integrators and differentiators. Schmitt triggers and others. Amplifier circuits are analyzed. The use of transducers, basic energy conversion devices is explored. Lab exercises demonstrate lecture concepts.
Course Rotation: PLV: Spring - Odd years.

PHY 211A Optics-Lecture Only (3 credits)

PHY 215 Thermodynamics and Quantum Theory (0-4 credits)
Topics include: laws of thermodynamics, concepts of entropy and free energy, thermodynamic properties of solutions, phase equilibria, electrolytic solutions, chemical equilibrium and kinetic theory of gases.

PHY 215A Topics: Thermodynamics and Quantum Theory-Lecture only (3 credits)
Topics include laws of thermodynamics, concepts of entropy and free energy, thermodynamic properties of solutions, phase equilibria, electrolytic solutions, chemical equilibrium and kinetic theory of gases.
Course Rotation: Fall;PLV

PHY 230 Microprocessor Electronics (0-4 credits)

PHY 231 Electromagnetism I (0-4 credits)
s: An intermediate course in electromagnetism. Starting with an overview of vector calculus the course discusses Poisson's and LaPlace's equations, D.C. currents and magnetic fields. Laboratory exercises exemplify principles discussed.
Course Rotation: NYC: TBA. PLV: Fall - Odd years.

PHY 232 Electromagnetism II (3 credits)
This course is a continuation of Electro-magnetism I. Starting with Maxwell's equations, the course discusses electromagnetic waves, boundary phenomena, transmission lines, waveguides and radiating systems.
Course Rotation: PLV: Spring - Even years.

PHY 235 Mechanics (4 credits)
An intermediate-level course in mechanics including the kinematics and dynamics of particles and rigid bodies, central forces, harmonic oscillations and an introduction to Lagrange's equations and Hamilton's principle.
Course Rotation: PLV: Fall - Even years.

PHY 296 Topics in Physics (3 credits)
This course will treat one or more topics which are not part of the standard course offerings of the department. With permission, it may be taken more than once for credit.
Course Rotation: TBA.

PHY 296A Topic: Material Science (3 credits)

PHY 296B Topic: Thermodynamics and Quantum Mechanics (0-4 credits)

PHY 296C Topic: Vector Analysis (2 credits)

PHY 296D Topic in Physics: Special Relativity (2 credits)

PHY 296E Topic: Analog/ Digital Systems (0-4 credits)

PHY 296F Topic: Physics-Modern Physics (3 credits)
This course will cover the main features in the development of modern atomic and quantum physics. Topics taught will include the black body problem, the photoelectric effect, the Compton effect, the Bohr theory of the hydrogen atom, wave-particle duality, Schroedinger's equation, and special relativity.

PHY 296G Topics in Physics: Mathematical Physics (3 credits)
This is a course on mathematical methods designed for intermediate to advanced students of physics, chemistry, engineering, and mathematics. The course is particularly intended for those students with one year of calculus who wants to develop, in a short time, a basic competence in the above-mentioned fields. The topics include: Infinite series,Complex numbers, Linear equations and Matrices, Vector analysis, Fourier series, Partial differentiation and Partial Differential equations, Coordinate transformation and Tensor analysis, and Special functions.

PHY 296H Topic: Introduction to Special Relativity (3 credits)
An introductory course on the special theory of relativity. The topics include: Physical Basis for Special Relativity; Relativistic Kinematics (Relativistic observers and reference frames, Lorentz Transformation, time dilation, length contraction and relativistic Doppler effect); Relativistic Dynamics (relativistic mass and momentum, Newton's 2nn law of relativity and relativistic energy); Special Relativity and Theory of Electromagnetism (electric and magnetic fields and their relativistic transformation, relativistic current densities, and invariance of the Maxwell's equations).

PHY 298 Topics in Physics (3 credits)

PHY 311 Optics (0-4 credits)
A lecture and laboratory course in geometrical, physical and quantum optics. Topics will include refraction, reflection and absorption of light; interference; diffraction, polarization and scattering of light; compton scattering, optical spectra and resonance.
Course Rotation: PLV: Fall - Even years.

PHY 320 Biophysics (3 credits)
This course provides a link between physics and biology which is not currently present in the courses offered. This course will provide the basis to build a minor in Health Physics which is a subject of high demand in the health professions and will serve as an additional elective for Biology majors.
Course Rotation: NY: Spring

PHY 321 Biomedical Physics (3 credits)
This is a one semester course providing instruction in medical physics. The aim of this course is to relate some of the concepts in physics to living systems. The concepts of physics will be applied to the human body and the applications of physics to biology and medicine will be explored. The syllabus covers topics of basic measurement and analysis techniques such as CT scan, endoscopy, MRI and fMRI imaging.
Course Rotation: FALL;NY

PHY 335 Quantum Mechanics (4 credits)
The course will review the Bohr theory of the hydrogen atom, introduce the Schroedinger equation and apply it to the atomic systems. The methods of quantum mechanics will be demonstrated in one dimensional potentials and hydrogen-like systems. The interpretation of the mathematical formalism in terms of physical observables will be emphasized. The time-dependent Schroedinger equation and the Heisenberg matrix methods will be introduced.
Course Rotation: PLV: Fall - Odd years.

Prerequisites: PHY 213 and PHY 235 or permission of Department.

PHY 352 Thermal Physics (3 credits)
The course presents entropy in classical thermodynamic systems undergoing thermal, mechanical, and chemical interactions. Engines and refrigerators are reviewed. Boltzmann and quantum statistical distributions are introduced and applied to ideal gasses, electron energies in solids, and black body radiation.
Course Rotation: PLV: Spring - Odd years.

Prerequisites: PHY 215 or Permission of Department Chair.

PHY 361 The Solid State (3 credits)

PHY 363 Materials Science (3 credits)
A course in the physical and chemical science of modern materials - metals, semiconductors, ceramics, polymers, glasses, alloys, etc. Various bonding mechanisms and structures are studied as well as chemical, thermal, electrical and mechanical characteristics.
Course Rotation: PLV: Spring - Odd years.

Prerequisites: PHY 112 and PHY 215 or permission of the department Chairperson.

PHY 373 Device Physics (3 credits)
This course offers a selection of advanced topics in quantum mechanics and its application to advanced materials. The quantum mechanics of electrons in electromagnetic fields, of molecules, and of radiation are introduced; followed by the quantum mechanics, statistical mechanics and transport properties of semiconductors.
Course Rotation: PLV: Spring - Even years.

PHY 390 Physics Seminar I (1 credits)
Students will make presentations for group discussion on current advances and research in physics. Required of all physics majors in junior year. A full year course.
Course Rotation: PLV: Fall.

Prerequisites: Junior standing or permission of Department Chair.

PHY 395 Independent Study in Physics (1-9 credits)
With the approval of the appropriate faculty member, the deapartment chairperson, and the academic dean, students may select a topic for guided research that is not included in the regular course offerings. The student meets regularly with the faculty member to review progress. A research project or paper must also be submitted.
Course Rotation: TBA.

PHY 395A Independent Study in Physics (A) (1-9 credits)

PHY 395B Independent Study in Physics (B) (1-9 credits)

PHY 395C Independent Study in Physics (C) (1-9 credits)

PHY 480 Research in Physics (3 credits)
Students will pursue after individual selection and invitation by faculty, supervised research projects in experimental or theoretical physics or astronomy. Each student will submit a written report and give an oral presentation of the research.
Course Rotation: TBA.

PHY 490 Physics Seinar II (1 credits)
Students will make presentations for group discussion on current advances and research in physics. Required of all physics majors in senior year. A full-year course.
Course Rotation: PLV: Fall.