Department of Physical Sciences

Kingsborough Community College
City University of New York

Course Descriptions

CHEMISTRY

CHM 100 – PREVIEW OF GENERAL CHEMISTRY
(0 crs. 2 hrs. – 2 equated credits)
Lecture and workshop introduces chemical nomenclature, symbolism, structure of atoms and molecules, isotopes and atomic weight, simple chemical reactions and balancing chemical equations. Mathematics necessary for chemistry included. Critical reading of chemistry texts. Students receive intensive help with weak areas.
Pre/Co-requisite: MAT 900
Required of all students who wish to enroll in CHM1100 and do not meet the prerequisites.

CHM 1100 – GENERAL CHEMISTRY I
(4 crs. 6 hrs.)
General Chemistry I introduces: stoichiometry, thermochemistry, atomic structure, periodic properties, bonding (especially of carbon compounds), the gaseous, liquid and solid states, phase changes, electrolytes, and the properties of selected elements in relation to environmental problems. Course includes a laboratory component.
Pre-requisites: MAT 900 or a passing score on the COMPASS parts 1 and 2 or a passing grade in MAT M200; **and** either CHM 100 or passing the exemption exam for CHM 100. Contact department for exemption exam information.
Required Core: Life and Physical Sciences
Flexible Core: Scientific World (Group E)

CHM 1200 – GENERAL CHEMISTRY II
(4 crs. 6 hrs.)
Study of chemical kinetics, equilibrium, acids, bases, salts, weak electrolytes and pH, solubility, entropy and free energy, electrochemistry, transition metal chemistry, nuclear chemistry and selected topics in organic chemistry. Laboratory experiments include classical and modern chemistry methods. Course includes a laboratory component.
Pre-requisites: CHM 1100
Required Core: Life and Physical Sciences
Flexible Core: Scientific World (Group E)

CHM 3100 – ORGANIC CHEMISTRY I
(5 crs. 9 hrs.)
Modern concepts of organic chemistry includes: structure and bonding reaction mechanism, stereochemistry, nomenclature and synthesis; relationship between structure and reactivity of the functional groups representing the principal classes or organic compounds. Laboratory covers fundamental operations of organic chemistry including determination of physical properties, experimental reactions and procedures, basis instrumentation and analysis. Course includes a laboratory component.
Pre-requisite: CHM 1200

CHM 3200 – ORGANIC CHEMISTRY II
(5 crs. 9 hrs.)
Continued study of structure and reactivity of organic compounds including structure and bonding, nomenclature, synthesis, stereochemistry and reaction mechanism of the important functional groups of organic compounds, Laboratory covers basic processes of organic chemistry, advanced instrumental methods, study of functional groups and derivatives and qualitative organic analysis. Selected students may be introduced to research methods. Course includes a laboratory component.
Pre-requisite: CHM 3100

CHM 81XX – INDEPENDENT STUDY
(1-3 crs. 1-3 hrs.)
Independent study of chemistry is developed individually between student and faculty member and must be approved by the department.

CHM 82XX – INDEPENDENT STUDY
(1-3 crs. 1-3 hrs.)
This course is of a topical and pilot nature and is designated to meet the immediate needs and interests of various student populations.

ENGINEERING SCIENCE

EGR 2100 – ENGINEERING DESIGN
(3 crs. 5 hrs.)
For a beginning engineering students, hands-on investigations and an appreciation of the importance of engineering in our society. In the laboratory, students will investigate problems relevant to the study of engineering including mechanical, robotic and bridge design. Computers will be utilized for all relevant laboratory sessions. Lecture discussions will include preparation for the labs and discussions of approaches engineers have used to solve difficult problems. Course includes a laboratory component.
Pre-requisite: Passing scores on the CUNY Reading and Writing exams and MAT 900
Co-requisite: MAT 1400

EGR 2200 – INTRODUCTION TO ELECTRICAL ENGINEERING
(3 crs. 4 crs.)
First course in electrical engineering, includes: circuit elements and their voltage-current relations; Kirchoff's law; elementary circuit analysis; continuous and discrete signals; differential and difference equations; first order systems. Course includes a laboratory component. **Required for Engineering Science Majors.**
Pre-requisites: MAT 2100, PHY 1400
Co-requisite: MAT 5500

EGR 2300 – INTRODUCTION TO ENGINEERING THERMODYNAMICS
(3 crs. 4 hrs.)
First course in engineering thermodynamics, topics include: Zeroth Law and absolute temperature; work, heat, First Law and applications; Second Law, Carnot theorems, entropy, thermodynamic state variables and functions, reversibility, irreversibility, and the ability functions; Ideal gas mixtures, mixtures of vapors and gas, humidity calculations. Course includes a laboratory component. **Required for Engineering Science Majors.**
Pre-requisites: CHM 1200, PHY 1400
Co-requisite: CS 1200

EARTH AND PLANETARY SCIENCE

EPS 3100 – METEOROLOGY
(4 crs. 6 hrs.)
Fundamental physical and chemical structure of the atmosphere including weather, climate, meteorological instrumentation, and air pollution. Course includes a laboratory component.
Pre-requisites: Passing scores on the CUNY Reading and Writing exams; a passing score on the COMPASS parts 1 and 2 or a passing grade in MAT M200; or department permission
Required Core: Life and Physical Sciences
Flexible Core: Scientific World (Group E)

EPS 3200 – OCEANOGRAPHY
(4 crs. 6 hrs.)
Factors that have a major influence on the physical and chemical structure of the oceans includes tides, waves, currents, oceanographic instrumentation and coastal oceanography. Course includes a laboratory component.
Pre-requisites: Passing scores on the CUNY Reading and Writing exams; a passing score on the COMPASS parts 1 and 2 or a passing grade in MAT M200; or department permission
Required Core: Life and Physical Sciences
Flexible Core: Scientific World (Group E)

EPS 3300 – PHYSICAL GEOLOGY
(4 crs. 6 hrs.)
Study of the nature of the Earth and its processes includes: mineral and rock classification; analysis of the agents of weathering and erosion; dynamics of the Earth's crust as manifest in mountain building, volcanoes and earthquakes; recent data concerning the geology of other planets; field and laboratory techniques of the geologist. Course includes a laboratory component.
Pre-requisites: Passing scores on the CUNY Reading and Writing exams; a passing score on the COMPASS parts 1 and 2 or a passing grade in MAT M200; or department permission
Required Core: Life and Physical Sciences
Flexible Core: Scientific World (Group E)

EPS 3500 – INTRODUCTION TO ASTRONOMY
(4 crs. 6 hrs.)
Concepts and methods of astronomical science, the early theories of the universe, astronomical instruments, the solar systems and its members, stars, galaxies, recently discovered objects, and study of modern cosmological ideas. Course includes a laboratory component.
Pre-requisites: Passing scores on the CUNY Reading and Writing exams; a passing score on the COMPASS parts 1 and 2 or a passing grade in MAT M200; or department permission
Required Core: Life and Physical Sciences
Flexible Core: Scientific World (Group E)

EPS 3800 – INTRODUCTION TO ASTRONOMY
(4 crs. 6 hrs.)
Concepts and methods of astronomical science, the early theories of the universe, astronomical instruments, the solar systems and its members, stars, galaxies, recently discovered objects, and study of modern cosmological ideas. Course includes a laboratory component.
Pre-requisites: Passing scores on the CUNY Reading and Writing exams; a passing score on the COMPASS parts 1 and 2 or a passing grade in MAT M200; or department permission
Required Core: Life and Physical Sciences
Flexible Core: Scientific World (Group E)

PHYSICS

PHY 100 – PREVIEW OF GENERAL PHYSICS
(0 crs. 2 hrs. – 2 equated crs.)
Topics covered include: measurements mathematical background, vectors, motion in a straight line, motion in a straight line, motion in a plane, forces, work, energy, power, momentum, impulse and angular motion in a plane.
Pre/Co-requisites: MAT 900

PHY 1100 – GENERAL PHYSICS I
(4 crs. 6 hrs.)
First term of a non-calculus two-semester lecture and laboratory course in a classical and modern physics. Includes study of mechanics, heat, hydrostatics and hydrodynamics, harmonic motion and waves. Physical principles are demonstrated and students receive hands-on laboratory experience. Course includes a laboratory component. **Recommended for students in liberal arts, pre-medical, pre-dental, pre-pharmacy, pre-optometry and allied health.**
Pre-requisite: MAT 1400

PHY 1200 – GENERAL PHYSICS II
(4 crs. 6 hrs.)
Second term of General Physics. Includes sound, electricity, magnetism and optics. Course includes a laboratory component.
Prerequisite: PHY 1100

PHY 1300 – GENERAL PHYSICS II
(4 crs. 6 hrs.)
First term of calculus lecture and laboratory course in classical and modern physics. Includes the study of mechanics, h eat, hydrostatics and hydrodynamics, harmonic motion and waves. Physical principles demonstrated and "hands-on" laboratory experience. **Recommended for science, engineering, pre-medical and allied health students who desire a more comprehensive treatment than given in PHY 1100.**
Pre/Co-requisite: MAT 1500
Required Core: Life and Physical Sciences
Flexible Core: Scientific World (Group E)

PHY 4200 – IDEAS OF MODERN PHYSICS
(3 crs. 3 hrs.)
The origin, ideas and scientific developments of modern physics including a brief description of Classical Physics; the Theory of Special and General Relativity; and Quantum Mechanics.
Pre-requisite: Passing scores on the CUNY Reading and Writing Exams; and a passing score on the COMPASS parts 1 and 2 or a passing grade in MAT M200.

PHY 81XX – INDEPENDENT STUDY
(1-3 crs. 3 1-3 hrs.)
Independent study of physics is developed individually between student and faculty member and must be approved by the department.

SCIENCE

SCI 2500 – APPLIED PHYSICAL SCIENCES FOR ALLIED HEALTH CAREERS
(3 crs. 5 hrs.)
Lecture and laboratory course on chemistry and physics topics with direct bearing on health services. Includes: mechanics, electricity, optics, atomic energy, radioactivity, atomic structure, chemical bonding, chemical equations, behavior of gases, respiration and oxygen therapy, properties of liquids and solutions including hydrostatics and hydrodynamics, acids and bases, plus an introduction to organic and biochemistry and drug calculations.
For Nursing Majors only.
Pre-requisite: Passing scores on the CUNY Reading and Writing Exams; and a passing score on the COMPASS parts 1 and 2 or a passing grade in MAT M200.

SCI 3700 – DEVELOPMENTS IN THE PHYSICAL SCIENCES AND THE ENVIRONMENT
(4 crs. 5 hrs.)
Basic concepts in the physical sciences and their applications in today's technologically advance world are presented. The impact that modern technology has on our physical environment is examined. Selected topics include: pollution, ozone layer depletion, global climate change, pesticides and chemicals in food, energy sources (renewable and non-renewable), and medical and military applications of technology. Students will engage in science through application of the methods of science (e.g. empirical, experimental and the scientific method). Students will develop the ability to formulate strong, logical, science-based arguments, evaluate and discuss environmental issues, and test hypothesis to improve problem solving skills.

SCI 5100 – CHEMISTRY AND ENVIRONMENT
(3 crs. 3 hrs.)
An investigation of important topics that involve the state of the environment from a scientific perspective. This course will cover topics that include global warming, stratospheric ozone depletion, acid rain, the carbon and nitrogen cycles, chemical and industrial pollution, the impact of fossil fuels, nuclear energy, and treatment.

SCI 5100LB – CHEMISTRY AND ENVIRONMENT
(3 crs. 3 hrs.)
The gathering, analysis, interpretation, and presentation of scientific data. The measure of selected physical, chemical and geological properties that influence the structure and function of ecological systems. Selected standard techniques used to observe, sample and describe natural systems.

SCI 7000 – THE SCIENCE OF NUTRITION
(4 crs. 5 hrs.) (3 hrs. lecture and 2 hrs. laboratory per week)
Learn and measure the physical and chemical properties that influence the structure and function of chemical properties that influence the structure and function of nutritional systems. Gain experience with practical applications of nutritional science. Practice the gathering, analysis, interpretation, and presentation of scientific data. Learn standard techniques used to observe, sample and describe natural systems.
Pre-requisites: Passing scores on the CUNY Reading and Writing exams.