

CHEMISTRY COURSE DESCRIPTIONS

CH 1014 (4CR)

PRINCIPLES OF INORGANIC CHEMISTRY

A course designed for students who are neither Chemistry majors nor minors. A survey of fundamental concepts of atomic structure, chemical bonding, states of matter, stoichiometry, gas laws, solutions, and nomenclature of Inorganic Chemistry.

Two lectures, one recitation and one two-hour laboratory period per week.

CH 1024 (4CR)

PRINCIPLES OF ORGANIC CHEMISTRY

A course designed for students who are neither Chemistry majors nor minors. A survey of nomenclature, structure and properties of important classes of organic compounds.

Two lectures, one recitation and one two-hour laboratory period per week.

CH 1301 (1CR)

GENERAL CHEMISTRY I COLLOQUIUM

This course is taken concurrently with CH 1315. Facilitated discussions, discrete study groups, and collaborative problem solving provide more thorough discourse on classroom concepts and theory. Inquiry-based learning techniques apply conjecture, logical reasoning, and critical thinking to support understanding and application theory. Colloquium and core course content based on materials covered in national standardized tests and Educational

Testing Service (ETS) standards. One (1) 2-hour session per week.

CH 2034 (4CR)

PRINCIPLES OF BIOCHEMISTRY

A course designed for students who are neither Chemistry majors nor minors. A survey of the properties, functions and metabolism of carbohydrates, lipids, proteins and other compounds of importance in biological systems. Two lectures, one recitation and one two-hour laboratory period per week.

CH 1301 (1CR)

CHEMISTRY COLLOQUIUM

Facilitated discussions, discrete study groups, and collaborative problem solving provide more thorough discourse on classroom concepts and theory. Inquiry based learning techniques apply conjecture, logical reasoning, and critical thinking to support understanding and application of theory. Colloquium and core course content are based on materials covered in national standardized tests and in the Educational Testing Service(ETS).

One 2-hour session per week.

CH 1315 (5CR)**GENERAL CHEMISTRY I**

An introduction to the fundamental theories, laws and techniques of chemistry with emphasis on the contributions chemistry is making to modern life.

Three lectures and two (2) two-hour laboratory periods per week.

Prerequisites: High school chemistry and algebra or NP 1113; MT 1323 or permission of the department.

CH 1515 (5CR)**GENERAL CHEMISTRY II**

A continuation of Chemistry 1315. Three (3) lectures and two (2) two-hour laboratory periods per week.

Prerequisite: CH 1315.

CH 2114 (4CR)**ANALYTICAL CHEMISTRY**

Volumetric and gravimetric analysis with special attention given to calculations and interpretations of analytical results.

Two lectures and two (2) two-hour laboratory periods per week.

Prerequisite: CH 1515.

CH 3001 (1CR)**TEST PREPAREDNESS**

Test workshops, study and review for comprehensive Exit Exams. Test workshops include mock tests, with group review and discussion of results, including strategies for improvement. Heavy emphasis on GRE preparation. Other comprehensive tests (i.e. ETS) also addressed. Vocabulary building and root word analysis stressed. Inquiry-based learning techniques applied. Facilitated by Langston STEM faculty or KAPLAN professionals, with assistance of STEM advanced scholars. One two-hour session per week. Required course for sophomore STEM majors.

CH 3224 (4CR)**INSTRUMENTAL ANALYSIS**

Theory and application of instrumental methods to chemical analysis. Survey of optical and electrometric determinations, chromatographic separations, and basic instrumentation used in chemical analysis.

Two lectures and two (2) three-hour laboratory periods per week.

Prerequisites: CH 2114 and CH 3315.

CH 3315 (5CR)**ORGANIC CHEMISTRY I**

A comprehensive survey of the chemistry of carbon compounds by functional groups. The laboratory portion of this course includes organic synthesis and the use of various instruments used in the characterization and identification of organic compounds.

Three lectures and two two-hour laboratory periods per week.

Prerequisites: CH 1315 and CH 1515.

CH 3325 (5CR)**ORGANIC CHEMISTRY II**

A continuation of Chemistry 3315. Three (3) lectures and two (2) two-hour laboratory periods per week.

Prerequisite: CH 3315.

CH 3415 (5CR)**PHYSICAL CHEMISTRY I**

Properties of matter in the gaseous state, elementary thermodynamics and chemical equilibrium, kinetic theory, and chemical kinetics.

Three (3) lectures and four (4) laboratory hours per week.

Prerequisites: CH 1515, PH 1125, MT 3624 or concurrent enrollment.

CH 3425 (5CR)**PHYSICAL CHEMISTRY II**

Electrochemistry, quantum theory, symmetry, molecular and electronic structure, spectroscopy, and structure.

Three (3) lectures and four (4) laboratory hours per week.

Prerequisite: CH 3415

CH 3454 (4CR)**GENERAL RESEARCH LABORATORY TECHNIQUES**

The purpose of this course is to give chemistry teacher candidates at the middle-school through high school levels a practical experience preparing courses and course materials including theory, laboratory and laboratory safety, delivering instruction theory, laboratory and laboratory safety, and evaluating student progress.

CH 4002 (2CR)**METHODS OF TEACHING CHEMISTRY & RELATED SCIENCES**

A practical introduction to pedagogy specific to chemistry and related sciences. The purposes, problems, issues, strategies, and materials in the teaching of science at the middle and high school levels will be examined critically through classroom discussions, individual and group work, field experiences, class projects, and peer teaching. Includes literature review, curriculum, material selection, lesson preparation, laboratory and laboratory safety, lecture, and other instructional formats, practice in delivery, assessment and evaluation.

Lecture 1 hour; laboratory 2 hours.

Prerequisite: Organic Chemistry II CH 3325 and admittance into Teacher Education program.

CH 4006 (3–6CR)**INTERNSHIP IN PHYSICAL SCIENCE**

Practical work experience in a chemical or related industry. Duration and credits vary 3–6 semester hours.

Prerequisites: Junior standing

CH 4133 (3CR)**INORGANIC CHEMISTRY**

Atomic structure, periodic relationships, chemical bonding, nomenclature, aqueous and nonaqueous chemistry, complex–ions and other important classes of inorganic compounds.

Three one–hour lectures per week.

Prerequisite: CH 3415.

CH 4233 (3CR)**ADVANCED ORGANIC CHEMISTRY**

Concepts of valence and molecular structure, electronic interpretation of organic reactions, stereochemistry.

Prerequisites: CH 3325 and CH 3415.

CH 4514 (4CR)**BIOCHEMISTRY**

Biological principles of cellular constituents. An introduction to chemical processes in living systems. Introduction to the study of carbohydrates, lipids, and proteins.

Two (2) lectures and two (2) two–hour labs per week.

Prerequisites: CH 2114 and CH 3325.

CH 4601 (1CR)

CHEMISTRY SEMINAR

The one-hour seminar course is designed to familiarize the chemistry student with discussing, analyzing and presenting chemical research topics. Each student will be required to complete a scientific paper that is either literature research-based or practical research-based in the area of chemistry. Three topics obtained from current literature are acceptable for literature assignments. The student will be required to present papers orally in a scientific seminar format and public setting, utilizing multimedia tools, overhead transparencies, slide projections, poster presentations, etc. The student project must relate the concepts of chemistry to contemporary, historical, technological and societal issues. In addition, the student will be required to research career opportunities in science and technology through literature research, brochures, internet and scientific periodicals.

CH 4612 (2CR)

INTRODUCTION TO CHEMICAL RESEARCH

This course will emphasize individualized research projects that are conducted to develop the student's high level technical and safety skills in the use of the scientific equipment and apparatus and in the use of the scientific literature in the solution of scientific problems. Students will conduct inquiry based open-ended investigation in chemistry with faculty supervision. The project must emphasize 1) the location of research resources; 2) the analysis, synthesis, theory and utility of chemical compounds and reactions; 3) laboratory and store room safety procedures, and 4) laboratory skills in research and instrumentation. The interpretation of findings, communication of results and judgments based on evidence must be demonstrated.

Work assignments may be for no less than 16 weeks for at least 10 hours per week, or for no less than 8 weeks for at least 20 hours per week.

Prerequisites: 21 hours of chemistry and consent of Department of Chemistry.

CH 4622 (2CR)

INTRODUCTION TO CHEMICAL RESEARCH

A continuation of CH 4612. Prerequisite: CH 4612.

COURSES

NATURAL SCIENCES (PHYSICAL) (NP/NS)

NP 0123 (0CR)

PHYSICAL SCIENCE: AN INTRODUCTION (INCLUDES LABORATORY)

A course designed for students who have a deficiency in physical science. A complex course in the basic principles and processes of physical science, with laboratory experiences.

NP 1113 (3CR)

NATURAL SCIENCE (PHYSICAL)

A survey of the physical sciences in which the student gains scientific information, laboratory experience and knowledge of science as a human enterprise. Emphasis is placed on problem analysis.

NP 3113 (3CR)

EARTH SCIENCE

The aim of the course is to present, as simply and clearly as possible, the essential laws and facts of a basic course in earth science. Because this science is so extensive and because it includes many of the essentials of physics, chemistry, geology, and astronomy, the course is more descriptive than quantitative.

COURSES

PHYSICS (PH)

PH 1101 (1CR)

PHYSICS I COLLOQUIUM

This course is to be taken concurrently with PH 1115. Facilitated discussions, discrete study groups, and collaborative problem solving provide more thorough discourse on classroom concepts and theory. Inquiry based learning techniques apply conjecture, logical reasoning, and critical thinking to support understanding and application of theory. Colloquium and core course content are based on materials covered in national standardized tests and in the Educational Testing Service (ETS).

One 2-hour session per week.

PH 1115 (5CR)

COLLEGE PHYSICS I

A five-hour course fulfilling the needs of students in electronics and technology. There will be three hours of lecture and four hours laboratory each week. Includes topics in properties of matter, mechanics, heat and sound.

Prerequisites: MT 1323 and MT 1613 or may be taken concurrently or with consent of instructor.

PH 1125 (5CR)

COLLEGE PHYSICS II

A five-hour continuation of Physics 1115. Includes topics of electricity, light, and modern physics.

PH 2015 (5CR)

COLLEGE PHYSICS: MECHANICS, HEAT, AND SOUND

A course designed for pre-engineering, mathematics, chemistry, biology, and other majors needing a rigorous background in physics. Topics in mechanics, heat, and sound will be included.

Three (3) lectures and two (2) two hour laboratory periods per week.

Prerequisite: MT 2145; may be taken concurrently.

PH 2025 (5CR)

COLLEGE PHYSICS: ELECTRICITY, MAGNETISM, AND LIGHT

A continuation of Physics 2015. Topics in electricity, magnetism, and light are included as well as an introduction to modern physics.

Three lectures and two two-hour laboratory periods per week.

Prerequisites: PH 2015; MT 3624 or consent of instructor.