CHEMISTRY (CHM)

CHM-1200 Principles of Chemistry (3 semester hours)
This one-term course for non-majors covers the basics of general, inorganic, and organic chemistry as they relate to health sciences. Topics covered include atomic structure, chemical bonding, radioactivity, behavior of gases and solutions, acid and bases, hydrocarbons, functional groups, and important biological molecules.
Co/prerequisite(s): MTH-1100 or MTH-1310 or MTH-2210; CHM-1200Z.

CHM-1200Z Principles of Chemistry Laboratory (1 semester hours)
Laboratory activities provide integration of experimental techniques and applications of concepts learned in CHM-1200. Lab reports are required.
Co/prerequisite(s): CHM-1200.

Additional fee required

CHM-1310 General Chemistry I (3 semester hours)
Fundamental principles of chemistry are covered in this course. Topics include atoms and molecules, nomenclature, stoichiometry, atomic structure and the periodic table, chemical bonding and geometry, and an introduction to equilibrium.
Co/prerequisite(s): MTH-1100, MTH-1310 or MTH-2210; CHM-1310Z.

CHM-1310Z General Chemistry I Laboratory (1 semester hours)
This course introduces students to basic principles of experimental general chemistry: aqueous reaction chemistry, mass composition, solid state chemistry, ionic and covalent compounds and their reactions, stoichiometric reactions, and molecular structure. Compounds will be analyzed and characterized. Lab reports are required.
Co/prerequisite(s): CHM-1310.

Additional fee required

CHM-1320 General Chemistry II (3 semester hours)
This course is a continuation of General Chemistry I. Topics include chemical equilibria, acid-base equilibria, solubility, reaction rates, electrochemistry, thermochemistry, and spontaneity of reactions.
Prerequisite(s): CHM-1310 with a grade of "C" or better; CHM-1310Z with a grade of "C" or better.

Co/prerequisite(s): CHM-1320Z.

CHM-1320Z General Chemistry II Laboratory (1 semester hours)
The course introduces students to fundamental concepts, such as acid-base chemistry (pH and titrations), thermodynamics, electrochemistry, and crystallography. Includes characterization of compounds. Lab reports are required.
Co/prerequisite(s): CHM-1320.

Additional fee required

CHM-1810-9 Selected Topics in Chemistry (Variable semester hours)
This course will address a specific area of study in chemistry not already covered by other course offerings. Prerequisites vary by topic.

CHM-2410 Organic Chemistry I (3 semester hours)
This course addresses the fundamental principles of organic chemistry, including nomenclature, molecular structure, stereochemistry, and substitution reactions. Emphasis on chemical bonding and mechanistic studies.
Prerequisite(s): CHM-1320 with a grade of "C" or better; CHM-1320Z with a grade of "C" or better.

Co/prerequisite(s): CHM-2410Z.

CHM-2410Z Organic Chemistry I Laboratory (1 semester hours)
Laboratory activities will provide integration of experimental techniques, such as extraction, chromatography, isolation of natural compounds, and applications of concepts learned in CHM-2410. Lab reports will be required.
Co/prerequisite(s): CHM-2410.

Additional fee required

CHM-2420 Organic Chemistry II (3 semester hours)
This course is a continuation of Organic Chemistry I. Topics include properties and reactions of aromatics, amines, and carbonyl compounds with emphasis on product synthesis and strategies. Introduction to spectroscopy.
Prerequisite(s): CHM-2410 with a grade of "C" or better; CHM-2410Z with a grade of "C" or better

Co/prerequisite(s): CHM-2420Z.

CHM-2420Z Organic Chemistry II Laboratory (1 semester hours)
Laboratory activities will provide integration of experimental techniques and applications of concepts learned in CHM-2420. Introduction to spectroscopy and characterization of compounds. Lab reports will be required.
Co/prerequisite(s): CHM-2420.

Additional fee required

CHM-2450 Analytical Chemistry (3 semester hours)
This course is a review of chemical equilibria, gravimetric analysis, acids, bases, and volumetric analysis, statistics in chemical analysis, molecular and atomic spectroscopy, and electroanalytical methods of analysis.
Prerequisite(s): CHM-1320 with a grade of "C" or better; CHM-1320Z.

Co/prerequisite(s): CHM-2450Z.

CHM-2450Z Analytical Chemistry Laboratory (1 semester hours)
Laboratory emphasizes the experimental techniques (e.g., elemental analyses, spectroscopy) discussed in lecture. Lab reports will be required.
Co/prerequisite(s): CHM-2450.

Additional fee required

CHM-2810-9 Selected Topics in Chemistry (Variable semester hours)
This course will address a specific area of study in chemistry not already covered by other course offerings. Prerequisites vary by topic.

CHM-3510 Physical Chemistry I (3 semester hours)
This course will focus on the study of chemical systems using physics principles. The first part of this course will cover the fundamentals of thermodynamics. Modern techniques in physical chemistry will be applied to different chemical systems experimentally and through computer simulations. The course covers the following topics: properties of gases, the laws of thermodynamics, work and heat, internal energy, enthalpy changes, heat capacity, entropy and entropy changes, phase stability and their phase transition, phase diagrams, simple mixtures, chemical equilibrium and a brief introduction to statistical thermodynamics.
Prerequisite(s): CHM-2420; CHM-2420Z; PHY-2240; PHY-2240Z; MTH-2220 with a grade of "C" or better.

Co/prerequisite(s): CHM-3510Z.

CHM-3510Z Physical Chemistry I Laboratory (1 semester hours)
This course emphasizes the experimental techniques and theories discussed in physical chemistry I. Students will apply the concepts taught on lecture through lab exercises, simulations and experiments. Subjects covered in addition to those in the lecture are electronics and the use of computers in lab instrumentation, software manipulation for data simulation and data analysis.
Co/prerequisite(s): CHM-3510.

Additional fee required

CHM-3520 Physical Chemistry II (3 semester hours)
This course is a continuation on the study of chemical systems with the application of physics principles. The focus on this course is on the structural and quantum mechanical properties of atomic and molecular systems. The course covers the following topics: introduction to quantum mechanics, motion at the atomic level, approximation techniques, atomic structure and atomic spectra, molecular structure, molecular symmetry and electronic transitions.
Prerequisite(s): Previous completion of CHM-2420; Previous completion of CHM-2420Z; Previous completion of PHY-2240; Previous completion of PHY-2240Z; Previous completion of MTH-2220 with a grade of "C" or better.

CHM-3555 Biochemistry (4 semester hours)
This course explores the four classes of macromolecules and the related chemical processes of living cells. Topics include the structure, chemical and physical properties, and biological functions metabolism of amino acids and proteins, carbohydrates, lipids and nucleic acids, with a particular emphasis on enzymology. Research methods and primary literature will be discussed.
Prerequisite(s): CHM-2410 with a grade of "C" or better; CHM-2410Z with a grade of "C" or better.

CHM-3570 Inorganic Chemistry of Materials (4 semester hours)
This course addresses the basic principles of inorganic chemistry. Topics include descriptive inorganic chemistry, structure and bonding, transition metal coordination chemistry, reaction mechanisms, solid state chemistry, electron transfer processes and aqueous reaction chemistry.
Prerequisite(s): CHM-1320 with a grade of "C" or better; CHM-1320Z with a grade of "C" or better.

CHM-3650 Instrumental Methods of Analysis (3 semester hours)
This course addresses the fundamentals of instrumental and classical methods of analysis. Introduction to biological and chemical sample preparation, separation techniques, volumetric, electrochemical, and spectroscopic methods.
Prerequisite(s): CHM-2450; CHM-2450Z.

Co/prerequisite(s): CHM-3650Z.

CHM-3650Z Instrumental Methods of Analysis Laboratory (1 semester hours)
Basic principles of instrumental analysis, including infrared spectroscopy, elemental analysis, potentiometry, and X-ray diffraction.
Co/prerequisite(s): CHM-3650.

Additional fee required

CHM-3790 ACCA Affiliated Course (2 semester hours)
In-depth lecture series offered by the Associated Colleges of the Chicago Area (ACCA) in areas of contemporary applications to chemistry. Permission of the Department Chair required.

CHM-3810-9 Selected Topics in Chemistry (Variable semester hours)
This course will address a specific area of study in chemistry not already covered by other course offerings. Prerequisites vary by topic.

CHM-3820/BIO-3820 Secondary Methods in Science (4 semester hours)
This course presents techniques that are effective for teaching in the biology content area at the secondary level. Topics include lesson planning, science education standards, assessment, curriculum design, inquiry-based lessons, and alternative teaching strategies. This is usually the last course the student takes prior to student teaching and includes a simultaneous practicum in addition to regular classroom hours. Placement applications for the practicum are due to the School of Education placement coordinator the January before the academic year of the practicum or for transfer students upon acceptance into the School of Education.
Prerequisite(s): Maintaining a constant GPA of 3.00, passing an FBI national fingerprint screening that encompasses passing a criminal background/sex offender check, passing a TB test, EDU-2100; EDU-2260; EDU-3620; EDU-3720.

CHM-4500 Chemical Research Methods (1 semester hours)
This course will reinforce skills needed to conduct research in the field of chemistry. A focus will be placed on the development and implementation of a research project, scientific writing, presentation methods in the chemical sciences, and the review of chemical literature.
Prerequisite(s): Previous completion of CHM-3650 with a grade of "C" or better.

CHM-4810-9 Selected Topics in Chemistry (Variable semester hours)
This course will address a specific area of study in chemistry not already covered by other course offerings. Prerequisites vary by topic.