

CHEMISTRY (CHEMISTRY)

CHEMISTRY 1010 Introduction to College Life for Chemistry Majors 1 Credit

This course is designed to provide a student with some of the academic and social skills that are necessary to successfully complete their academic career specially in the area of Chemistry. Topics include important study skills necessary to maintain success in college-level study, student rights responsibilities, campus diversity issues, academic policies, academic advising and registration, time management, and campus and Chemistry Departmental resources for students.

Components: Discussion, Class

CHEMISTRY 1020 Introductory Chemistry 2 Credits

A one semester course for students who do not have a sufficiently strong chemistry background to succeed in Chemistry 1450. Topics will include measurements, atomic and molecular structure, periodicity, stoichiometry, states of matter, intermolecular forces, and solutions.

Components: Discussion, Class

Prereqs/Coreqs: P. math placement score of 15 or higher

CHEMISTRY 1050 Survey of General Chemistry 5 Credits

A one-semester survey of chemistry including organic and inorganic compounds. A course to partially satisfy the laboratory science requirement, and for students who need only one semester of chemistry for their major.

Components: Discussion, Laboratory, Class

GE: Natural Science

CHEMISTRY 1110 Introduction to Chemistry Research 1 Credit

Through a series of faculty presentations and informal receptions, students will learn about research projects that are currently being conducted on our campus by UWP chemistry faculty. Students will also learn how best to approach an undergraduate research experience: strategies for seeking a faculty mentor, how to negotiate the research process itself, the role that ethics play in science, and so on. Students will also carry out critical analyses of research papers, draft proposals, and attend workshops. As second-semester freshmen, they will receive timely advice on how best to organize their activities in order to complete their degrees on schedule, with the most successful learning outcomes.

Components: Discussion, Class

CHEMISTRY 1140 General Chemistry I 4 Credits

First semester of a two-semester sequence. Basic theory and concepts; atomic structure, periodic laws, stoichiometry, gas laws, thermochemistry, solutions, the chemical bond, oxidation-reduction.

Components: Class, Laboratory

GE: Natural Science

Prereqs/Coreqs: P. a "C-" or better MATH 1530 or MATH 1920 (formerly 1630) or MATH 1730 or MATH 1830 or math proficiency level of 20 or higher

CHEMISTRY 1150 General Chemistry I with Math Development 5 Credits

Basic theory and concepts of Chemistry with additional focus on mathematical and analytical techniques. Investigates atomic structure, periodic laws, stoichiometry, gas laws, thermochemistry, solutions, chemical bonding, oxidation-reduction. Additional emphasis on algebraic and graphing methods for scientists.

Components: Laboratory, Class

GE: Natural Science

Prereqs/Coreqs: P. Previous completion with a 'C-' or better in Math 1530 or concurrent enrollment in MATH 1530 or math proficiency level of 15 or higher

CHEMISTRY 1240 General Chemistry II 4 Credits

Second semester of a two-semester sequence. Kinetics, chemical equilibrium, electrochemistry, thermodynamics, organic, descriptive and nuclear chemistry.

Components: Class, Laboratory

GE: Natural Science

Prereqs/Coreqs: P. 'C-' or better in CHEMISTRY 1140 or 'C-' or better in CHEMISTRY 1450 or ('C-' or better in CHEMISTRY 1150 and 'C-' or better in MATH 1530)

CHEMISTRY 1450 Chemistry for Engineers 5 Credits

A one semester course for engineering students with a strong background in high school chemistry and mathematics. Topics include measurements, atomic theory, stoichiometry, molecular structure, thermochemistry, states of matter, intermolecular forces, solutions, kinetics, equilibrium, thermodynamics, electrochemistry, solid state, material science and organic chemistry.

Components: Laboratory, Class

GE: Natural Science

Prereqs/Coreqs: P. an "A" or B" in high school chemistry or a "C" or better in CHEMISTRY 1020 and previous completion or concurrent enrollment in MATH 2530 or higher

CHEMISTRY 2000 Undergraduate Research 1-3 Credits

Training in research methods, use of scientific literature and evaluation of data. A student may register for one to three credits in a given semester.

Components: Independent Study

Prereqs/Coreqs: P. a "C-" or better in one semester of general chemistry

CHEMISTRY 2150 Quantitative Analysis 4 Credits

Theories and principles of gravimetric and volumetric analysis, equilibrium and stoichiometry of solubility, neutralization, oxidation-reduction, complexometry; introduction to absorption spectrophotometry, flame photometry, ion exchange, and statistical treatment of data.

Components: Class, Laboratory

Prereqs/Coreqs: P. a "C-" or better in CHEMISTRY 1240

CHEMISTRY 2730 Inorganic Chemistry 4 Credits

An introductory course with an emphasis on coordination chemistry, solid state chemistry, descriptive chemistry of the common representative and transition elements, metallurgy.

Components: Class, Laboratory

Prereqs/Coreqs: P. a "C-" or better in CHEMISTRY 1240

CHEMISTRY 3110 Environmental Chemistry Lab 1 Credit

Laboratory complementary to CHEM 3130 in which students gain experience in the laboratory techniques and methods associated with structure, composition, and chemical reactions of the three spheres of the environment.

Components: Laboratory

Prereqs/Coreqs: P. CHEMISTRY 3130 or concurrent enrollment

CHEMISTRY 3130 Environmental Chemistry 3 Credits

A study of structure, composition, and chemical reactions of the three major spheres of the environment: atmosphere, hydrosphere, and lithosphere. Additional inquiries into the human impact on the environment and environmental toxicology are also addressed.

Components: Class

Prereqs/Coreqs: P. a "C-" or better in CHEMISTRY 1240 or CHEMISTRY 1450

CHEMISTRY 3270 Forensic Chemistry 2 Credits

An in-depth examination of forensic applications of chemical analysis: presumptive and confirmatory drug identification, microscopic techniques in trace evidence analysis, quality assurance, quality control (QA-QC) issues for the crime lab analyst, the toxicology of illicit compounds, and modern methods of DNA analysis related to criminalistics.

Components: Class

Prereqs/Coreqs: P. a "C-" or better in CHEMISTRY 2150 and CHEMISTRY 3540

CHEMISTRY 3510 Organic Chemistry I Lab 1 Credit

Laboratory complementary to CHEMISTRY 3540 which involves an introduction to basic organic laboratory techniques including gas chromatography and infrared spectroscopy.

Components: Laboratory

Prereqs/Coreqs: P. a "C-" or better in CHEMISTRY 3540 or concurrent enrollment in CHEMISTRY 3540

CHEMISTRY 3520 Organic Chemistry Lab Bootcamp 2 Credits

This course provides the synthetic organic chemistry laboratory experience needed for chemistry and science majors, and pre-professional majors in medicine, dentistry, pharmacy, and chiropractic. This accelerated schedule includes 85 hours of instruction and lab over a two-week period of time. The goal is to provide a laboratory experience for students who are taking organic chemistry lecture at small campuses via distance education but who do not have access to laboratory instruction. The course will also serve other students who have been unable to complete organic chemistry laboratory. CHEMISTRY 3520 includes reactions and techniques typically covered in both semesters of organic chemistry lecture. Students enrolled in CHEMISTRY 3520 are expected to demonstrate understanding of all reactions and techniques covered in the laboratory.

Components: Laboratory

Prereqs/Coreqs: P. a 'C' or better in CHEMISTRY 3540

CHEMISTRY 3540 Organic Chemistry I 4 Credits

An introduction to organic chemistry including a study of aliphatic and aromatic compounds and the functional groups, fundamentals of organic structural theory, chemical bonding, nomenclature, stereochemistry, infrared spectroscopy, structure/property relationships and analysis, as well as proteins, carbohydrates, and other natural compounds.

Components: Class

Prereqs/Coreqs: P. a "C-" or better in CHEMISTRY 1240 or "B-" or better in CHEMISTRY 1450

CHEMSTRY 3610 Organic Chemistry II Lab 1 Credit

Continuation of CHEMSTRY 3510. Complementary to CHEMSTRY 3630 involving preparations of greater difficulty and an introduction to organic qualitative analysis.

Components: Laboratory

Prereqs/Coreqs: P. a "C-" or better in CHEMSTRY 3510 and a "C-" or better in CHEMSTRY 3630 or concurrent enrollment in CHEMSTRY 3630

CHEMSTRY 3630 Organic Chemistry II 3 Credits

A second semester of organic chemistry providing an in-depth study of the preparation, reactions, and analysis of the functional groups with an emphasis on mechanisms, structure/property relationships, multistep synthesis, nuclear and mass spectrometry, and pericyclic reactions.

Components: Class

Prereqs/Coreqs: P. a "C-" or better in CHEMSTRY 3540

CHEMSTRY 3810 Chemical Synthesis and Characterization 1 Credit

For students desiring additional laboratory experience. In cooperation with the instructor, students will select experiments which require insights into the application and execution of more sophisticated techniques.

Components: Laboratory

Prereqs/Coreqs: P or C: CHEMSTRY 3610

CHEMSTRY 3900 Directed Studies 1-3 Credits

Supervised individual study of a topic selected by the student and approved by the staff. A student may register for one to three credits in a given semester and may accumulate a total of four credits.

Components: Independent Study

Prereqs/Coreqs: P. 12 credits of chemistry

CHEMSTRY 4000 Undergraduate Research 1-3 Credits

Training in research methods, use of scientific literature and evaluation of data; results presented in a written report. A student may register for one to three credits in a given semester and may accumulate a total of four credits.

Components: Independent Study

Prereqs/Coreqs: P. 18 credits in chemistry and department consent

CHEMSTRY 4060 Chemistry Seminar 1 Credit

This course will develop student's abilities to present scientific findings in both seminar and poster format.

Components: Seminar

Prereqs/Coreqs: P. satisfied speech general education requirement and a chemistry major

CHEMSTRY 4110 Physical Chemistry Lab I 1 Credit

Experimental studies applying theoretical principles to practical problems and processes involving chemical and physical phenomena. Fundamentals of chemical measurement using chemical and physical sensors.

Components: Laboratory

Prereqs/Coreqs: P. a "C-" or better in CHEMSTRY 2150; C: "C-" or better in CHEMSTRY 4130

CHEMSTRY 4130 Physical Chemistry I 4 Credits

Atomic structure, thermodynamics and quantum mechanics, molecular structure, spectroscopy, intermolecular interactions, macromolecules, structure of liquids and solids.

Components: Class

Prereqs/Coreqs: P. a "C-" or better in PHYSICS 1450 or PHYSICS 2340, and MATH 2640

CHEMSTRY 4210 Physical Chemistry Lab II 1 Credit

Advanced experimental studies applying theoretical principles to chemical and physical phenomena.

Components: Laboratory

Prereqs/Coreqs: P. a "C-" or better in CHEMSTRY 4110; P or C: CHEMSTRY 4230

CHEMSTRY 4230 Physical Chemistry II 3 Credits

Statistical and quantum mechanics, transport processes, thermodynamics, spectroscopy, solutions, phase transitions, and kinetics.

Components: Class

Prereqs/Coreqs: P. a "C-" or better in CHEMSTRY 4130 and MATH 2740

CHEMSTRY 4240 Instrumental Analysis 4 Credits

Theory and laboratory experience in instrumental methods of analysis; common electrochemical and spectrochemical methods, chromatographic methods, electronics and other selected topics.

Components: Laboratory, Class

Prereqs/Coreqs: P. a "C-" or better in both CHEMSTRY 2150 and CHEMSTRY 4130

CHEMISTRY 4320 Polymer and Supramolecular Chemistry 2 Credits

An introduction to the preparation, characterization, and physical properties of macromolecular and supramolecular materials: synthetic polymers, biological macromolecules, metal/covalent-organic frameworks, selected supramolecular assemblies. Relationship of physical properties to structure and composition with material applications.

Components: Class

Prereqs/Coreqs: P. "C-" or better in CHEMISTRY 3540 and CHEMISTRY 4130

CHEMISTRY 4610 General Biochemistry Lab 1 Credit

Chemistry of biological compounds and biochemical techniques.

Components: Laboratory

Prereqs/Coreqs: C: CHEMISTRY 4630 or concurrent enrollment

CHEMISTRY 4630 General Biochemistry 3 Credits

Introduction to the chemistry of proteins, carbohydrates, lipids, and nucleic acids in biological systems including the basics of metabolism and enzyme kinetics.

Components: Class

Prereqs/Coreqs: P. a "C-" or better in CHEMISTRY 3540

CHEMISTRY 4660 Cooperative Field Experience 1-8 Credits

Enhancement of the educational experience through placement of a student with a cooperative agency, business, industry or institution. The nature of the assignment, type of experience, number of credits and evaluation procedure to be stipulated in a statement of agreement (learning contract) between the student and the department.

Components: Field Studies

CHEMISTRY 4680 Criminalistics Emphasis Internship 2 Credits

This 8-credit course involves working 360 hours with an accredited crime laboratory. The course is designed for the student to integrate the fundamental theory from the first three years of the Criminalistics Emphasis curriculum with the opportunity to work as an intern in a fully functioning crime laboratory as a bench scientist. Students will likely conduct research and development work during their time in the laboratory and are required to complete weekly reports, assignments, and presentations related to the experience.

Components: Field Studies

Prereqs/Coreqs: P. a "C-" or better in CHEMISTRY 2150 and CHEMISTRY 3630

CHEMISTRY 4730 Advanced Topics in Inorganic Chemistry 2 Credits

A survey of the theories of atomic and molecular structure and chemical bonding; advanced descriptive studies of the common elements.

Components: Class

Prereqs/Coreqs: P. a "C-" or better in CHEMISTRY 2730 and CHEMISTRY 4130

CHEMISTRY 4810 Advanced Topics in Organic Chemistry 2 Credits

Selected topics from among recent advances in mechanisms, structure-reactivity correlations, stereochemistry and conformational analysis, resonance and molecular orbital theory, spectra, natural products, heterocyclic systems and synthesis.

Components: Class

Prereqs/Coreqs: P. a "C-" or better in CHEMISTRY 3630 and CHEMISTRY 3610 and C: CHEMISTRY 4230

CHEMISTRY 4830 Biochemistry Topics 3 Credits

An in-depth study of metabolism and regulation and enzyme mechanisms as well as cell communication, transport mechanisms, and immunology, gene expression, and regulation.

Components: Class

Prereqs/Coreqs: P. a "C-" or better in CHEMISTRY 4630

CHEMISTRY 4910 Advanced Biochemistry Laboratory 1 Credit

Advanced experimental studies applying theoretical principles discussed in CHEMISTRY 4830 including protein binding, protein characterization, gene expression and gene regulation.

Components: Laboratory