

Chemistry Courses

Chemistry

WCSAM	114	Science of Food and Drink	(4)
<p>Food and drink are central to living and this culinary course takes a chemistry approach to the study of how different foods and drinks are created. During this highly interactive course, students will learn fundamental principles in chemistry and then use them to create various foods and drink. Topics such as chemical composition, chemical bonding, chemical interactions, chemical properties and chemical reactivity will be explored using chemicals and biological organisms common in a kitchen. Concepts will be studied through experimentation using the kitchen as the laboratory environment. During the course, other important and sometimes controversial food science topics will be discussed. Additionally, examples and illustrations pulled from recent events will be given to heighten the general awareness of other chemicals present in society and the benefits and risks associated with their use. (WCore: WCSAM)</p>			
WCSAM	400	Science Capstone	(2)
<p>This capstone seminar provides students with an opportunity to extend their learning through designing and conducting an interdisciplinary science capstone project in small teams. Students will learn how to develop and complete collaborative STEM (science, technology, engineering, and mathematics) research projects, and present their work both on campus and in the local community. This course is designed to complement senior projects within students' majors, and satisfies the WCore Capstone requirement. (WCore: WCSAM, SC)</p>			
CHEM	103	Introduction to Chemistry and Lab	(4)
<p>A general introductory course dealing with the basic fundamentals of chemistry, specifically for pre-nursing students. Emphasis is placed on atomic structure, states of matter, the periodic table and chemical bonding, chemical symbols, nomenclature and chemical equations, types of chemical reactions, calculations from chemical equations, the characteristics of gases, and the chemistry of solutions and colloids.</p>			
CHEM	111 & 112	Principles of Chemistry I and II and Lab	(4/4)
<p>A course in inorganic chemistry designed for students majoring in chemistry, biology, pre-professional programs in the sciences, and other science fields. Emphasis is placed on a detailed analysis of the fundamental principles of chemistry on both a theoretical and descriptive level.</p>			
CHEM	111R	Chemistry 111: Recitation	(0)
<p>An add on to the Chemistry 111 course aimed at bolstering students' math, problem-solving and deductive reasoning skills.</p>			
CHEM	201	Organic and Biochemistry	(4)
<p>A descriptive introduction to organic chemistry and biochemistry with a biological/pharmacological emphasis. The course involves a brief introduction to organic structures, nomenclature and functional groups followed by a detailed discussion of proteins, lipids, carbohydrates, nucleic acids, energy transfer and metabolism.</p>			
CHEM	300	Special Topics in Chemistry	(2-4)
<p>Topics of interest and importance to students majoring in chemistry, biology, and physics will be offered as needed. Special Topics may be used as elective hours in the Chemistry majors or minors.</p>			
CHEM	303	Organic Chemistry I and Lab	(4)
<p>This course develops foundational knowledge with particular focus on the basic principles to study the physical and chemical properties of all carbon compounds particularly emphasizing alkanes, alkenes and alkynes. It includes detailed study of nomenclature, stereochemistry, spectrometry, synthesis and reactivity, highlighting the each of the typical mechanisms. Scaffolded writing assignments introduce scientific and technical writing as it applies to manuscript preparation.</p>			
CHEM	301	Organic Chemistry II and Lab	(4)

This course further develops concepts in organic chemistry with particular focus on oxygen containing, nitrogen containing and aromatic compounds. It includes detailed study of the physical and chemical properties of carbon compounds addressing nomenclature, stereochemistry, spectroscopy, spectrometry, synthesis and reactivity with particular focus on reaction mechanisms. Manuscript writing further develops scientific and technical writing skills. The class is designed for chemistry, biology and pre-professional science majors.

CHEM 306 Quantitative Analysis and Lab (4)

A study of the theory and practice of quantitative analytical chemistry. Topics include kinetics, chemical equilibrium, acid-base chemistry, complex formation, ionic strength effects, and oxidation-reduction reactions. The lab involves an in-depth study of gravimetric and volumetric methods, as well as a range of instrumental analyses with a focus on quality assurance/quality control. Students will gain experience with multiple modes of scientific communication, and will learn to apply statistics to data collected in the lab, with statistical tests covered including one-sample t-test, two sample t-test, paired t-test, linear regression, and ANOVA. The course includes a multi-week community based lab and science global learning outreach component which requires attendance at least one evening during the term outside normal class or lab time. (WCore: EWRLD)

CHEM 307 Instrumental Analysis and Lab (4)

Theory and laboratory work in absorption and emission spectroscopy (AA, UV-vis, IR and fluorometry); electroanalytical chemistry and chromatography as they apply to analytical chemistry.

CHEM 320 Inorganic Chemistry and Lab (4)

Inorganic chemistry is concerned with the chemistry of all of the elements except carbon. Selected topics that give the student broad exposure to the modern applications of inorganic chemistry are presented, as well as the underlying theories on which the subject is based. Topics include symmetry and group theory, bonding in inorganic compounds, the solid state, chemical forces, and coordination chemistry. Interesting aspects of the chemistry of selected elements are covered. The students gain laboratory experience with the synthetic techniques of inorganic chemistry including vacuum line synthesis techniques. They also learn how to characterize inorganic materials using instrumental techniques.

CHEM 350 Biochemistry and Lab (4)

A study of the chemistry of living organisms. Begins with a review of basic biology and organic chemistry as it applies to the biological system, water and its importance in the biological system and energy considerations. Detailed discussion of the structure and function of proteins, enzymology, carbohydrate structure and metabolism by both aerobic and anaerobic metabolism, and the structure and function of lipids and biological membranes. The required lab will include a student designed research project. Both the course and laboratory assignments will heavily emphasize scientific and technical writing.

CHEM 370 Scientific Computing (4)

An introduction to programming techniques that apply to a wide range of scientific disciplines. Topics include basic programming principles, equation solving, and model simulation. Students who have completed CMPT 201 may not take this course without instructor's approval. Same as BIOL 370 and PHYS 370.

CHEM 401 Directed Studies in Chemistry (4)

A tutorial-based course used only for student-initiated proposals for intensive individual study of topics not otherwise offered in the Chemistry Program. Requires senior standing and consent of instructor and school dean. This course is repeatable for credit.

CHEM 421 Physical Chemistry I and Lab (4)

A study of the basic principles of quantum mechanics and its application to atomic structure, molecular structure and spectroscopy. A laboratory section accompanies the lecture.

CHEM 422 Physical Chemistry II and Lab (4)

A study of the theoretical macroscopic properties of matter. An introduction to statistical mechanics and chemical thermodynamics with applications to gases, solutions, and phase and chemical equilibria. A laboratory section accompanies the lecture.

CHEM 430 Undergraduate Research (1-4)

Students undertake a portion of a research project and learn all aspects of scientific inquiry. One credit hour equates to three hours per week in the laboratory. This course may be taken one credit at a time. This course is repeatable for credit.

CHEM 440 Internship (1-8)

Offers students the opportunity to integrate classroom knowledge with practical experience. Prerequisites: junior or senior standing (for transfer students, at least 15 hours completed at Westminster), minimum 2.5 GPA, and consent of program director and Career Center internship coordinator. This course is repeatable for credit.

CHEM 487 Undergraduate Teaching (1)

Provides an opportunity for teaching experience in lower-division laboratories by junior- and senior-level chemistry majors and minors. CHEM 487 may not be used as elective hours in the chemistry majors or minors. This course is graded on a credit/no credit basis. Permission of program director required. This course is repeatable for credit.