CHE - CHEMISTRY

CHE 1001 Chemistry and Society (FE) (4 Units)
Designed to introduce non-science students to the major ideas of modern chemistry and their relevance in contemporary society. Chemical principles are examined and applied to areas such as nutrition, medicine, agriculture, pollution, and energy issues.
Meets a Foundational Explorations requirement; does not count toward any Chemistry Department majors.
Prerequisite(s): MTH 0099 or equivalent.

CHE 1002 Chemistry in our Everyday Lives (FE) (3 Units)
An introduction to basic principles of chemistry as they apply to our everyday lives. The course will include discussions on the chemistry of one or more major topics chosen by the instructor. (Possible topics include cooking, forensic science, health and nutrition, sustainable energy, or climate and the environment.)
Pre or Corequisite(s): MTH 0099 or equivalent.
Corequisite(s): CHE 1002L

CHE 1002L Chemistry in our Everyday Lives Lab (FE) (1 Unit)
A lab course designed for a hands-on exploration of basic principles of chemistry as they apply to our everyday lives.
Pre or Corequisite(s): CHE 1002

CHE 1003 Introduction to General, Organic, and Biological Chemistry (FE) (4 Units)
Examination of those aspects of inorganic and organic chemistry that are pertinent to biology and chemistry. Examines the structures and metabolic reactions of biomolecules. Provides a background for nursing, family and consumer sciences and physical education majors.
Meets a Foundational Explorations requirement; does not count toward any Chemistry Department majors.
Corequisite(s): CHE 1003L and MTH 0099 or equivalent.

CHE 1003L Introduction to General, Organic, and Biological Chemistry Lab (FE) (1 Unit)
An inquiry-based laboratory that is a co-requisite for CHE1003.
Pre or Corequisite(s): CHE 1003

CHE 1052 General Chemistry I (FE) (4 Units)
Study of the basic principles of modern chemistry. Emphasis on atomic and molecular structure, chemical bonding, gas laws, states of matter, and solutions.
Prerequisite(s): Satisfactory high school background or CHE 1003 or PSC 1014.
Corequisite(s): CHE 1052L

CHE 1052L General Chemistry I Lab (FE) (1 Unit)
An inquiry-based laboratory that is a co-requisite for CHE 1052.
Letter grade.
Corequisite(s): CHE 1052

CHE 1053 General Chemistry II (3 Units)
Study of the basic principles of modern chemistry. Emphasis on chemical kinetics and equilibrium, acid base theory, thermodynamics, solubility, metals, and general descriptive chemistry.
Prerequisite(s): CHE 1052
Corequisite(s): CHE 1053L

CHE 1053L General Chemistry II Lab (1 Unit)
An inquiry-based laboratory that is a co-requisite for CHE 1053.
Letter grade.
Corequisite(s): CHE 1053

CHE 2001 Serving Through Healing: An Introduction to Health Professions (1 Unit)
Course for students interested in the health professions of medicine, dentistry, optometry, pharmacy, and veterinary medicine. This course will introduce students to the various health professions and provide biblical and historical perspectives on healthcare and healing. This course will provide time for reflection to determine if the health professions are the right career or vocational path and practical application process guidelines and medical skills.
Credit/No Credit.

CHE 2013 Analytical Chemistry (3 Units)
Examination of the theories and techniques of quantitative chemical analysis, with some emphasis on instrumental methods. Classical methods such as gravimetry, titrimetry, spectroscopy, electrochemistry, and chromatography will be discussed and used.
Course includes one three-hour laboratory each week.
Prerequisite(s): CHE 1053

CHE 2094 Organic Chemistry I (3 Units)
Study of organic compounds by functional group families with emphasis on structures, reactions, mechanisms, stereochemistry, and synthesis.
Prerequisite(s): CHE 1053
Corequisite(s): CHE 2094L

CHE 2094L Organic Chemistry I Lab (1 Unit)
An inquiry-based laboratory that is a co-requisite for CHE 2094.
Letter grade.
Corequisite(s): CHE 2094

CHE 2096 Organic Chemistry II (3 Units)
Examination of basic organic chemistry from a mechanistic perspective and the use of synthetic procedures.
Prerequisite(s): CHE 2094
Corequisite(s): CHE 2096L

CHE 2096L Organic Chemistry II Lab (1 Unit)
An inquiry-based laboratory that is a co-requisite for CHE 2096.
Letter grade.
Corequisite(s): CHE 2096

CHE 3025 Physical Chemistry I (3 Units)
Study of classical thermodynamics as it is applied to physical and chemical systems. Includes discussion of the three laws and their application to thermochemistry, reaction energetics and chemical equilibrium.
Prerequisite(s): CHE 2013, MTH 1044 or MTH 1064, and PHY 1054 or PHY 2054
Corequisite(s): CHE 3025L

CHE 3025L Physical Chemistry I Lab (1 Unit)
An inquiry-based laboratory that is a co-requisite for CHE 3025.
Letter grade.
Corequisite(s): CHE 3025

CHE 3026 Physical Chemistry II (3 Units)
Study of reaction dynamics and complex reaction mechanisms and an investigation of matter from a quantum chemistry perspective with particular emphasis on the theoretical concepts and their implications for molecular spectroscopy.
Prerequisite(s): CHE 2013, MTH 1044 or MTH 1064, and PHY 1054 or PHY 2054

CHE 3027 Physical Chemistry II Laboratory (1 Unit)
Designed to accompany CHE 3026. Reaction dynamics and molecular structures are investigated using spectroscopic methods including ultraviolet-visible, fluorometry and FT-infrared instrumentation.
One four-hour laboratory each week.
Corequisite(s): CHE 3026

CHE 3051 Organic Structure Elucidation (2 Units)
Introduction to modern spectrometric techniques for elucidating the structure of organic compounds, including one- and two-dimensional nuclear magnetic resonance spectroscopy, infrared spectroscopy and mass spectrometry.
Course includes a weekly laboratory.
Prerequisite(s): CHE 2096 and consent of instructor.

CHE 3070 Instrumental Analysis (2 Units)
Analytical analysis using instruments such as gas chromatography, high performance liquid chromatography, ultraviolet-visible, FT-infrared and nuclear magnetic resonance spectroscopy, and mass spectrometry.
One four-hour laboratory each week.
Prerequisite(s): CHE 2013 and consent of instructor.

CHE 4050 Advanced Biochemistry (3 Units)
Detailed analysis of protein and membrane structure. Includes quantitative approaches to the study of enzymes, catalytic mechanisms of enzymes, and a survey of the major metabolic pathways of carbohydrates, lipids, amino acids and nucleic acids.
Also offered as BIO 4050.
Prerequisite(s): BIO 2010 and CHE 2094
Corequisite(s): CHE 4050L

CHE 4050L Advanced Biochemistry Lab (1 Unit)
An inquiry-based laboratory that is a co-requisite for CHE 4050.
Letter grade.
Corequisite(s): CHE 4050

CHE 4053 Advanced Organic Chemistry (2 Units)
Advanced study of organic reaction mechanisms including: the Hammett equation, isotope and substituent effects and orbital symmetry. Modern synthetic reactions are presented.
Prerequisite(s): CHE 2096 and consent of instructor.

CHE 4054 Advanced Organic Chemistry Laboratory (1 Unit)
Designed to accompany CHE 4053. Emphasis on modern synthetic methods and purification of complex reaction mixtures.
One four-hour laboratory each week.
Corequisite(s): CHE 4053

CHE 4066 Bioinorganic Chemistry (2 Units)
Development of significant topics in bioinorganic chemistry particularly those at the interface of chemistry and biology. Emphasis is placed on understanding the role of metals in biological systems such as enzymes and DNA.
Prerequisite(s): CHE 2096 or consent of instructor.

CHE 4067 Advanced Inorganic Chemistry Laboratory (1 Unit)
Designed to accompany CHE 4068. Emphasis on the preparation, purification and characterization of main group and transition metal inorganic and organometallic compounds.
One four-hour laboratory each week.
Pre or Corequisite(s): CHE 4068

CHE 4068 Advanced Inorganic Chemistry (3 Units)
The principles of inorganic chemistry, including symmetry, atomic and molecular structure, bonding theories, energetics, kinetics, and spectroscopy, are developed and applied to a range of inorganic compounds.
Prerequisite(s): CHE 3026 or consent of instructor.

CHE 4070 Environmental Chemistry (3 Units)
This course covers the chemistry of Earth's environment, including the natural chemical processes as well as anthropogenic contributions. The environment in this context is divided into the atmosphere, the hydrosphere, the lithosphere, and anthrosphere. Particular emphasis is given to human influences in each of these "spheres," including the causes, effects, detection, prevention, and mitigation of pollution. Environmental pollution is a global problem, with many technological and cultural causes, and as such requires an understanding of numerous disciplines in order to solve. This course thus involves the integration of concepts from chemistry, biology, geology, ecology, atmospheric sciences, hydrology, toxicology, political science, and others.
Prerequisite(s): CHE 2013, CHE 2094, and CHE 2094L

CHE 4070L Environmental Chemistry Laboratory (1 Unit)
Designed to accompany CHE 4070. The lab component will focus primarily on detection of pollutants in air and water by using modern chemical instrumentation. The skills learned will be applied to a class research project.
One four-hour laboratory each week.
Pre or Corequisite(s): CHE 4070

CHE 4075 Special Topics in Chemistry (2 Units)
Discussion of chemical topics of special relevance to students and faculty. Possible topics include: statistical thermodynamics, group theory and molecular spectroscopy, enzyme kinetics, photochemistry, organometallic chemistry, organofluorine chemistry, medicinal chemistry, electrophilic and radical additions, and mechanistic aspects of water chlorination.
Prerequisite(s): CHE 2096 or consent of instructor.

CHE 4090 Internship in Chemistry (1-3 Units)
Authentic work experience in jobs that are oriented to the field of chemistry and that include some responsibility for decision making, problem solving, and the use of techniques, skills, and knowledge acquired in the classroom.
May be repeated up to a maximum of three (3) units. Credit/No Credit.
Prerequisite(s): Junior or Senior standing; consent of department chair and faculty advisor.
"C" Designation is for California Internships. "E" Designation is for Out of State Internships.

CHE 4095 Chemistry Seminar (1 Unit)
Presentation of papers by students and visiting scholars, and attendance at off-campus seminars.
Prerequisite(s): Senior standing and consent of instructor.

CHE 4099 Research in Chemistry (1-2 Units)
An independent investigation, under faculty supervision, of a specific problem at the frontier of a chemical field.
Includes weekly discussion sessions. May be repeated up to a maximum of four (4) units.
Corequisite(s): Consent of instructor.
Open to Juniors and Seniors.