

CHE - CHEMISTRY

CHE 1001 Chemistry and Society (GE) (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 General Education requirement; does not count toward any Chemistry Department majors. Letter grade.

Prerequisite(s): MTH 0099 or equivalent.
(GELO1E)

CHE 1002 Chemistry in our Everyday Lives (GE) (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.)

Letter grade.

Pre or Corequisite(s): MTH 0099 or equivalent.

Corequisite(s): CHE 1002L

Fee: Course fee applies. See "Special Fees" in Financing a PLNU Education.
(GELO1D)

CHE 1002L Chemistry in our Everyday Lives Lab (GE) (1 Unit)

A lab course designed for a hands-on exploration of basic principles of chemistry as they apply to our everyday lives.

Letter grade.

Pre or Corequisite(s): CHE 1002
(GELO1D)

CHE 1003 Introduction to General, Organic, and Biological Chemistry (GE) (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 General Education requirement; does not count toward any Chemistry Department majors. Letter grade.

Corequisite(s): CHE 1003L and MTH 0099 or equivalent.

Fee: Course fee applies. See "Special Fees" in Financing a PLNU Education.
(GELO1E)

CHE 1003L Introduction to General, Organic, and Biological Chemistry Lab (GE) (1 Unit)

An inquiry-based laboratory that is a co-requisite for CHE1003. Letter grade.

Pre or Corequisite(s): CHE 1003
(GELO1E)

CHE 1050 Introduction to General Chemistry I (2 Units)

This course provides an introduction into concepts and problem-solving skills necessary for CHE 1052.

Credit/No Credit.

Prerequisite(s): Consent of instructor.

CHE 1052 General Chemistry I (GE) (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.

Letter grade.

Prerequisite(s): Satisfactory high school background or CHE 1003 or PSC 1014.

Corequisite(s): CHE 1052L

Fee: Course fee applies. See "Special Fees" in Financing a PLNU Education.
(GELO1E)

CHE 1052L General Chemistry I Lab (GE) (1 Unit)

Designed to accompany CHE 1052. An introduction to chemistry lab techniques and analyzing chemical data.

Letter grade.

Corequisite(s): CHE 1052
(GELO1E)

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.

Letter grade.

Prerequisite(s): CHE 1052

Corequisite(s): CHE 1053L

Fee: Course fee applies. See "Special Fees" in Financing a PLNU Education.

CHE 1053L General Chemistry II Lab (1 Unit)

Designed to accompany CHE 1053. An introduction to chemistry lab techniques and analyzing chemical data.

Letter grade.

Corequisite(s): CHE 1053

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. Letter grade.

Prerequisite(s): CHE 1053

Fee: Course fee applies. See "Special Fees" in Financing a PLNU Education.

CHE 2013L Analytical Chemistry Lab (0 Units)

A laboratory that is a corequisite for CHE 2013.

Credit/No Credit.

Prerequisite(s): CHE 1053 and CHE 1053L

Corequisite(s): CHE 2013

CHE 2094 Organic Chemistry I (3 Units)

Study of organic compounds by functional group families with emphasis on structures, reactions, mechanisms, stereochemistry, and synthesis.

Letter grade.

Prerequisite(s): CHE 1053

Corequisite(s): CHE 2094L

Fee: Course fee applies. See "Special Fees" in Financing a PLNU Education.

CHE 2094L Organic Chemistry I Lab (1 Unit)

A skills and technique-based lab designed to accompany 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.

Letter grade.

Prerequisite(s): CHE 2094

Corequisite(s): CHE 2096L

Fee: Course fee applies. See "Special Fees" in Financing a PLNU Education.

CHE 2096L Organic Chemistry II Lab (1 Unit)

A skills and technique-based lab designed to accompany CHE 2096.

Letter grade.

Corequisite(s): CHE 2096

CHE 3025 Chemical Thermodynamics and Kinetics (3 Units)

Study of classical physical chemistry that includes thermodynamics, reaction energetics, chemical equilibrium, and reaction kinetics.

Letter grade.

Prerequisite(s): CHE 2013, MTH 1044 or MTH 1064, and PHY 1044 or PHY 2044

Corequisite(s): CHE 3025L

Fee: Course fee applies. See "Special Fees" in Financing a PLNU Education.

CHE 3025L Chemical Thermodynamics and Kinetics Lab (1 Unit)

Designed to accompany CHE 3025. Measurements of the thermodynamic properties of chemical systems.

Letter grade.

Corequisite(s): CHE 3025

CHE 3026 Quantum Chemistry (3 Units)

Study of quantum mechanics in the context of physical chemistry, with applications in computational chemistry and molecular spectroscopy.

Letter grade.

Prerequisite(s): CHE 2013, MTH 1044 or MTH 1064, and PHY 1054 or PHY 2054

Corequisite(s): CHE 3026L

CHE 3026L Quantum Chemistry Lab (1 Unit)

Designed to accompany CHE 3026. Emphases on spectroscopic methods and computational chemistry.

One four-hour laboratory each week. Letter grade.

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. Letter grade.

Prerequisite(s): CHE 2096 and consent of instructor.

Fee: Course fee applies. See "Special Fees" in Financing a PLNU Education.

CHE 3051L Organic Structure Elucidation Lab (0 Units)

A laboratory that is a corequisite for CHE 3051.

Credit/No Credit.

Prerequisite(s): CHE 2096

Corequisite(s): CHE 3051

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. Letter grade.

Prerequisite(s): CHE 2013 and consent of instructor.

Fee: Course fee applies. See "Special Fees" in Financing a PLNU Education.

CHE 3070L Instrumental Analysis Lab (0 Units)

A laboratory that is a corequisite for CHE 3070.

Credit/No Credit.

Prerequisite(s): CHE 2013 and CHE 2013L

Corequisite(s): CHE 3070

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.

Letter grade.

Also offered as BIO 4050.

Prerequisite(s): BIO 2010 and CHE 2094

Corequisite(s): CHE 4050L

Fee: Course fee applies. See "Special Fees" in Financing a PLNU Education.

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.

Letter grade.

Prerequisite(s): CHE 2096 and consent of instructor.

CHE 4054L Advanced Organic Chemistry Lab (1 Unit)

Often taken with CHE 4053. Emphasis on modern synthetic methods and purification of complex reaction mixtures in the context of a research project.

One four-hour laboratory each week. Letter grade.

Fee: Course fee applies. See "Special Fees" in Financing a PLNU Education.

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.

Letter grade.

Prerequisite(s): CHE 2096 or consent of instructor.

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.

Letter grade.

Prerequisite(s): CHE 3026 or consent of instructor.

CHE 4068L Advanced Inorganic Chemistry Lab (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. Letter grade.

Pre or Corequisite(s): CHE 4068

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.

Letter grade.

Prerequisite(s): CHE 2013, CHE 2094, and CHE 2094L

CHE 4070L Environmental Chemistry Lab (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. Letter grade.

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.

Letter grade.

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.

Letter grade.

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. Letter grade.

Corequisite(s): Consent of instructor.

Fee: Course fee applies. See "Special Fees" in Financing a PLNU Education.

Open to Juniors and Seniors.