

## Chemistry

**CHEMISTRY – CHEM**

Joseph Gorga, Dean

Physical Sciences and Engineering Division

Physical Sciences Building, Room 263

**Possible career opportunities**

Chemists identify and solve problems by applying logic, scientific thinking, and knowledge of natural laws. Chemistry majors work in educational settings and in government, non-profit charities, or research foundations. Chemists work in manufacturing companies, cosmetic companies, environmental assessment firms, medical laboratories, petroleum companies and pharmaceutical companies. They also can become health administrators, and physicians (all specialties). Many careers require more than two years of college study.

**CHEM-106 Chemistry for Non-Science Majors**

4 units SC

- 54 hours lecture/54 hours laboratory per term
- Prerequisite: MATH-090 or MATH-090E or MATH-090SP or one year of high school algebra or equivalent
- Recommended: Eligibility for ENGL-122 or equivalent
- Note: This is not a preparatory course for other chemistry courses

This course is designed to develop scientific literacy for non-science majors and to meet the general education requirement for physical science with laboratory. The course places chemistry concepts in a practical context using qualitative and quantitative examples that are encountered in everyday life. Laboratory exercises include hands-on experiments related to concepts covered in lecture. C-ID CHEM 100, CSU, UC (credit limits may apply to UC - see counselor)

**CHEM-107 Integrated Inorganic, Organic, and Biological Chemistry**

5 units SC

- 72 hours lecture/54 hours laboratory per term
- Prerequisite: MATH-090 or MATH-090E or MATH-090SP or one year of high school algebra or equivalent
- Recommended: Eligibility for ENGL-122 or equivalent
- Note: This course does not fulfill the prerequisite to CHEM-120.

This course is an intensive survey of the fundamentals of chemistry, which explores and applies the topics of inorganic and organic chemistry to biochemistry. This course satisfies the requirements of nursing and other health-career programs that require one term of chemistry. CSU

**CHEM-108 Introductory Chemistry**

4 units SC

- 54 hours lecture/54 hours laboratory per term
- Prerequisite: MATH-090 or MATH-090E or MATH-090SP or one year of high school algebra or equivalent
- Recommended: Eligibility for ENGL-122 or equivalent

This course is an introduction to the experimental science of chemistry. Using mathematical word problems and chemical terms, the student will have an overview of inorganic chemistry. This course is appropriate for those that have no high school chemistry experience. CSU, UC (credit limits may apply to UC - see counselor)

**CHEM-109 Introduction to Organic and Biochemistry**

4 units SC

- 54 hours lecture/54 hours laboratory per term
- Prerequisite: CHEM-108 or CHEM-120 or high school chemistry or equivalent

This course provides a focused introduction to the chemistry of living things. Organic Chemistry (the study of carbon compounds) is linked to biochemistry (the chemical basis of life) through the relationship of molecular structure and function. This is the second course of a two-semester sequence (with CHEM-108) that satisfies the requirements of allied health programs such as nursing and dental hygiene that require one year of chemistry. CSU, UC (credit limits may apply to UC-see counselor)

**CHEM-120 General College Chemistry I**

5 units LR

- 54 hours lecture/108 hours laboratory per term
- Prerequisite: CHEM-108 or score of 3, 4 or 5 on AP Chemistry Test or appropriate chemistry skill level demonstrated through Chemistry Diagnostic Test or equivalents; and MATH-120 or 120SP or equivalent
- Recommended: Eligibility for ENGL-122 or equivalent

This course presents an introduction to the fundamentals of chemistry. Atomic theory, chemical reactions, bonding, structure, stoichiometry, gases, solutions, redox, thermochemistry, and chemical kinetics will be covered. C-ID CHEM 110, CHEM-120+121=C-ID CHEM 120S, CSU, UC

**CHEM-121 General College Chemistry II**

5 units LR

- 54 hours lecture/108 hours laboratory per term
- Prerequisite: CHEM-120 or equivalent

This course is a continuation of CHEM-120. Equilibria including gaseous and acid base equilibria, buffers, titration curves, solubility products, thermodynamics, electrochemistry, coordination complexes, nuclear chemistry, quantitative experiments, and qualitative analysis will be addressed. CHEM-120+121=C-ID CHEM 120S, CSU, UC

## Chemistry

**CHEM-226 Organic Chemistry I**

5 units LR

- 54 hours lecture/108 hours laboratory per term
- Prerequisite: CHEM-121 or equivalent

This course is the first term of a two term sequence (CHEM-226-227) that covers structure and bonding, stereochemistry, conformational analysis, reaction mechanisms, and the nomenclature, physical properties, and reactions of various classes of organic compounds (alkanes, alkenes, alkynes, alkyl halides, alcohols, and ethers). Basic organic laboratory techniques are introduced and used in syntheses or other projects. Chemical safety, information retrieval and good laboratory practices are emphasized. A variety of laboratory instrumentation skills are developed including operation and analysis using GC, IR and UV-Visible spectroscopy. C-ID CHEM 150 CHEM-226 + CHEM-227 = C-ID CHEM 160S, CSU, UC

**CHEM-227 Organic Chemistry II**

5 units LR

- 54 hours lecture/108 hours laboratory per term
- Prerequisite: CHEM-121 and CHEM-226 or equivalents

A continuation of CHEM-226, this second term course covers spectroscopy, additional reaction mechanisms, the nomenclature, physical properties, and reactions of other basic classes of compounds (aromatics, organometallics, aldehydes, ketones, carboxylic acids and their derivatives, and amines). The nature and reactions of multifunctional compounds, and the structure and reactions of biochemical molecules (carbohydrates, lipids, amino acids, proteins and nucleic acids) are also discussed. Laboratory work includes hands-on spectroscopic techniques (i.e. NMR, IR), qualitative organic analysis, more advanced projects involving synthesis, and a literature research project using university-level chemical literature resources. CHEM-226 + CHEM-227 = C-ID CHEM 160S, CSU, UC

**CHEM-298 Independent Study**

.5-3 units SC

- Variable hours
- Note: Submission of acceptable educational contract to department and Instruction Office is required.

This course is designed for advanced students who wish to conduct additional research, a special project, or learning activities in a specific discipline/subject area and is not intended to replace an existing course. The student and instructor develop a written contract that includes objectives to be achieved, activities and procedures to accomplish the study project, and the means by which the supervising instructor may assess accomplishment. CSU

**CHEM-299 Student Instructional Assistant**

.5-3 units SC

- Variable hours
- Note: Applications must be approved through the Instruction Office. Students must be supervised by a DVC instructor.

Students work as instructional assistants, lab assistants and research assistants in this department. The instructional assistants function as group discussion leaders, meet and assist students with problems and projects, or help instructors by setting up laboratory or demonstration apparatus. Students may not assist in course sections in which they are currently enrolled. CSU