American River College’s chemistry program offers you one of the highest quality educations in the field whether you are seeking to transfer to a 4-year college, get an associate’s degree, or seeking to obtain vocational training. The Chemistry Department’s commitment is to rigorous academic standards, large selection of classes, student-friendly atmosphere, and interactive classes taught by highly trained faculty. Our diverse faculty are dedicated to teaching and learning and have studied at universities worldwide. They have backgrounds that cover all aspects of chemistry. The Department provides hands-on experiential learning as well as access to nationally award-winning peer assisted tutorial programs (Beacon).

Career Opportunities
The opportunities for those that have a core knowledge and understanding of the principles of chemistry are varied. Fields requiring a background in chemistry include: Chemistry, Medicine/Nursing, Engineering, Dentistry, Biochemistry, Forensics, Physical Therapy, Veterinary Medicine, Biotechnology, Respiratory Therapy, Dental Assistant/Physician Assistant, Psychology, Biology, Environmental Science, Pharmacy, Pathology, Nutrition and Food Science, Physics, Optometry, Criminal Justice, Viticulture, Chiropractic Medicine, Geology, and Exercise Science.

CHEM 130 Chemistry for Funeral Service 4 Units
Corequisite: BUS 340, ENGR 300, FSE 110, and FSE 160
Enrollment Limitation: Acceptance into the Funeral Service Education program.
Hours: 72 hours LEC
This course is a survey of the basic principles of chemistry as they relate to funeral service. Topics include chemical principles involved in sanitation, disinfection, public health, and embalming practices. The development and use of personal, professional, and community sanitation practices are covered, as well as use and precautions related to potentially harmful chemicals that are currently used in the field of funeral service.

CHEM 290 PACE: The Scientific Method—A Hands-On Approach 1 Unit
Hours: 18 hours LEC
This course is designed for students in the Partnership to Assure College Entry (PACE) program. It offers a first experience in college science for high school students. It focuses on concepts from several different disciplines of science. The principles of science are developed and understood through a variety of interactive activities.

CHEM 305 Introduction to Chemistry 5 Units
Prerequisite: MATH 100 or 104 with a grade of “C” or better
Advisory: ENGWR 102 or 103, and ENGRD 116 with a grade of “C” or better; OR ESLR 320 and ESLW 320 with a grade of “C” or better; OR placement through assessment process.
General Education: AAAS Area IV; CSU Area B1; CSU Area B3; IGETC Area 5A
Course Transferable to UC/CSU
Hours: 72 hours LEC; 54 hours LAB
This course covers general principles of chemistry, such as unit analysis, atomic structure, nomenclature, mole concept, stoichiometry, and gases. A brief introduction to organic chemistry and biochemistry is provided. It is primarily designed for allied health majors.

CHEM 306 Introduction to Chemistry 5 Units
Prerequisite: CHEM 305 with a grade of “C” or better
Advisory: ENGWR 102 or 103, and ENGRD 116 with a grade of “C” or better; OR ESLR 320, ESLI 320 and ESLW 320 with a grade of “C” or better; OR placement through assessment process.
Course Transferable to UC/CSU
Hours: 72 hours LEC; 54 hours LAB
This course is a continuation of CHEM 305. It covers the organic functional groups and reactions involved in the chemistry of life (biochemistry), as applied to the health sciences.

CHEM 309 Integrated General, Organic, and Biological Chemistry 5 Units
Prerequisite: MATH 100 or 104 with a grade of “C” or better; or placement through the assessment process.
Advisory: ENGRD 116, ENGWR 102, ESLR 320, ESLW 320, and MATH 120
General Education: AAAS Area IV; CSU Area B1; CSU Area B3
Course Transferable to CSU
Hours: 72 hours LEC; 54 hours LAB
This course is an intensive survey of general, organic, and biological chemistry specifically designed for nursing majors and other health-related fields. Topics include general chemistry, organic chemistry, and biological chemistry as they apply to chemistry of the human body. This course satisfies the requirements of those health-care programs which require one semester of chemistry. Students who had chemistry in high school and retained some it are advised to take CHEM 309. Students who have not taken a chemistry course recently or have never taken a chemistry course are advised to take the CHEM 305 & 306 sequence. Students enrolled in CHEM 309 are strongly encouraged to co-enroll in CHEM 311.

CHEM 310 Chemical Calculations 4 Units
Prerequisite: MATH 100 or 104 with a grade of “C” or better
Corequisite: MATH 120 or 124
Advisory: ENGWR 102 or 103, and ENGRD 116 with a grade of “C” or better; OR ESLR 320 and ESLW 320 with a grade of “C” or better; OR placement through assessment process.
General Education: AAAS Area IV
Course Transferable to CSU
Hours: 54 hours LEC; 54 hours LAB
This course is an introduction to chemical calculations, terminology, chemical concepts and laboratory techniques. It is designed for those who will take CHEM 400 and need intensive preparation in problem solving.
**CHEM 311 Strategies for Problem Solving in Chemistry** .75 Units
Corequisite: CHEM 305, 306, 309, 310, 400, 401, 420, 421, or 423
Course Transferable to CSU
Hours: 41 hours LAB
This course develops analytical reasoning strategies, critical thinking skills, and problem-solving abilities for both quantitative and qualitative problems in chemistry. It is designed to support students enrolled in most chemistry courses at American River College. Strategies and content will be specific to the area of chemistry studied in the co-requisite. This course may be taken four times with a different co-requisite. Pass/No Pass only.

**CHEM 325 Pollution, Poisons, and Planet Earth** 4 Units
Advisory: MATH 32; ENGRD 116 or ESLR 320
General Education: AA/AS Area IV; CSU Area B1; CSU Area B3; IGETC Area 5A
Course Transferable to UC/CSU
Hours: 54 hours LEC; 108 hours LAB
This course describes the fundamental concepts of general, organic, and biological chemistry as they relate to human-made and natural pollution and poisons in the environment. The laboratory part of the course is designed to highlight current topics in environmental chemistry, investigate indicators of a healthy or polluted environment, and to investigate the effects of toxic chemicals on living systems. Field trips are required.

**CHEM 334 Chemistry in the Kitchen** 3 Units
General Education: AA/AS Area IV
Course Transferable to CSU
Hours: 54 hours LEC
This course qualitatively covers a variety of chemical principles in the context of cooking. These principles include basic atomic structure and geometry, phase changes, acids and bases, proteins and denaturing, fermentation, fats and carbohydrates. This course is designed for K-6 educators who want to increase their understanding of chemistry principles. Many of the topics are keyed to the new California State Science Standards.

**CHEM 400 General Chemistry** 5 Units
Prerequisite: MATH 120 OR 124 with a grade of “C” or better AND one of the following:
1) CHEM 310 with a grade of “C” or better 2) Or CHEM 305 with a grade of “C” or better and placement through the chemistry assessment process
3) Or High School chemistry with a grade of “C” or better and placement through the chemistry assessment process
Advisory: ENGWR 102 or 103, and ENGRD 116 with a grade of “C” or better; OR ESLR 320 and ESLW 320 with a grade of “C” or better; OR placement through assessment process.
General Education: AA/AS Area IV; CSU Area B1; CSU Area B3; IGETC Area 5A
Course Transferable to UC/CSU
Hours: 54 hours LEC; 108 hours LAB
This course covers the basic principles of chemistry with an emphasis on chemical calculations, chemical reactions including balancing of complicated reduction-oxidation (REDOX) reactions, stoichiometry, gas laws, thermochemistry, atomic structure and bonding theories, ionic equations, solutions, intermolecular forces and phases of matter and acid/base chemistry including titrations and pH. Laboratory work is devoted to investigations of the theoretical work discussed in lecture.

**CHEM 311 Strategies for Problem Solving in Chemistry** .75 Units
Corequisite: CHEM 305, 306, 309, 310, 400, 401, 420, 421, or 423
Course Transferable to CSU
Hours: 41 hours LAB
This course develops analytical reasoning strategies, critical thinking skills, and problem-solving abilities for both quantitative and qualitative problems in chemistry. It is designed to support students enrolled in most chemistry courses at American River College. Strategies and content will be specific to the area of chemistry studied in the co-requisite. This course may be taken four times with a different co-requisite. Pass/No Pass only.

**CHEM 325 Pollution, Poisons, and Planet Earth** 4 Units
Advisory: MATH 32; ENGRD 116 or ESLR 320
General Education: AA/AS Area IV; CSU Area B1; CSU Area B3; IGETC Area 5A
Course Transferable to UC/CSU
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Advisory: ENGWR 102 or 103, and ENGRD 116 with a grade of “C” or better; OR ESLR 320 and ESLW 320 with a grade of “C” or better; OR placement through assessment process.
General Education: AA/AS Area IV; CSU Area B1; CSU Area B3; IGETC Area 5A
Course Transferable to UC/CSU
Hours: 54 hours LEC; 108 hours LAB
This course covers the basic principles of chemistry with an emphasis on chemical calculations, chemical reactions including balancing of complicated reduction-oxidation (REDOX) reactions, stoichiometry, gas laws, thermochemistry, atomic structure and bonding theories, ionic equations, solutions, intermolecular forces and phases of matter and acid/base chemistry including titrations and pH. Laboratory work is devoted to investigations of the theoretical work discussed in lecture.
CHEM 480  **Honors General Chemistry**  1 Unit

Prerequisite: CHEM 400 with a grade of "C" or better; ENGWR 300 with a grade of "C" or better or honors placement on the English assessment; GPA of 3.0 or better.

Corequisite: CHEM 401.

Course Transferrable to UC/CSU

Hours: 18 hours LEC

This honors course provides advanced studies for general chemistry students. It involves in-depth discussion and analysis of recent scientific articles in terms of general chemical principles.

CHEM 482  **Biology/Chemistry Honors Seminar**  1 Unit

Same As: BIOL 480

Prerequisite: Cumulative GPA of 3.0 or above; CHEM 400 and BIOL 400 with a grade of "C" or better; ENGWR 300 or 480 with a grade of "C" or better.

Course Transferrable to CSU

Hours: 18 hours LEC

This honors section will provide a seminar approach for advanced students of general chemistry and biology to discuss and analyze in-depth recent scientific articles in terms of the chemical and biological principles introduced in these curricula. Not open to students who have taken BIOL 480. May be taken two times for credit.