

CUYAMACA COLLEGE
COURSE OUTLINE OF RECORD

CHEMISTRY 012 – STRATEGIES FOR SUCCESS IN CHEM 102 INTRODUCTION TO GENERAL, ORGANIC AND BIOLOGICAL CHEMISTRY

3 hours laboratory, 1 unit

Catalog Description

The purpose of this course is to review and reinforce the skills and knowledge necessary for success in CHEM 102 (Introduction to General, Organic & Biological Chemistry). Students will strengthen their abilities related to critical thinking strategies, time management skills, coupled with unique features of effective reading strategies in science, technical writing skills and mastery of basic chemistry skills critical to CHEM 102. **Pass/No Pass only. Non-degree applicable.**

Prerequisite

None

Corequisite

Concurrent enrollment in CHEM 102

Entrance Skills

Without the following skills, competencies and/or knowledge, students entering this course will be highly unlikely to succeed:

- 1) Perform basic arithmetic operations: addition, subtraction, multiplication and division using positive and negative numbers.
- 2) Perform calculations involving fractions, decimals and exponents. Understand and express numbers in scientific (exponential) notation.
- 3) Understand and calculate percent. Convert percentages into decimal form and vice versa.
- 4) Calculate arithmetic average.
- 5) Use a scientific calculator to perform the types of calculations described above in items 1-4.
- 6) Solve linear algebraic equations; solve word problems involving linear equations.
- 7) Understand and determine the magnitudes of angles in units of degrees.
- 8) Recognize plane geometric figures such as triangles and squares; differentiate among the terms linear, planar and three-dimensional.
- 9) Perform calculations and solve equations involving ratio and proportion techniques.
- 10) Graphing in the Cartesian coordinate system
- 11) Solve linear algebraic equations; solve word problems involving linear equations
- 12) Perform dimensional analysis and interpret the result

Course Content

- 1) Overview of STEM fields: careers and academic paths
- 2) Studying for, reading and writing in STEM; resources at Cuyamaca College
- 3) Nomenclature and chemical reaction review
- 4) Chemical calculations applied to clinical dosage review
- 5) Atomic structure and bonding review
- 6) Solutions, gases and acid/base chemistry review
- 7) Organic nomenclature & functional group review
- 8) Basic organic synthesis review
- 9) Review of basic biochemical molecules
- 10) Review of metabolic pathways

Course Objectives

Students will be able to:

- 1) Build their knowledge of careers in STEM & academic transfer requirements in STEM disciplines of interest
- 2) Become familiar with Cuyamaca College student resources
- 3) Improve time management, study skills, and learn aspects of effective note taking
- 4) Successfully identify and employ various aspects of technical reading and writing for a chemistry class
- 5) Review & reinforce knowledge of chemical nomenclature skills
- 6) Review & reinforce knowledge of algebra related to dimensional analysis & general chemical calculations
- 7) Review & reinforce knowledge of chemical reaction types, including nuclear reactions
- 8) Review & reinforce knowledge of concepts & problems related to functional groups in organic compounds
- 9) Review & reinforce knowledge of simple organic synthesis
- 10) Review & reinforce knowledge of major categories of biomolecules
- 11) Review & reinforce basic knowledge of metabolic pathways

Method of Evaluation

A grading system will be established by the instructor and implemented uniformly. Grades will be based on student effort and demonstrated proficiency in subject matter determined by multiple measurements for evaluation, one of which will be essay writing, skills demonstration or, where appropriate, the symbol system.

- 1) Level of student engagement in problem-solving workshops exhibited by group and individual worksheet & board work
- 2) Written reflections related to (1) careers and the courses of study in STEM disciplines, (2) reading assignments, among other

Special Materials Required of Student

- 1) Scientific calculator, CHEM 102 textbook & lab manual
- 2) Highlighters, three-ring binder
- 3) Academic Planner (provided)

Minimum Instructional Facilities

- 1) Smart classroom with a number of writing boards, wall-sized periodic table, and overhead projector/screen

Method of Instruction

- 1) Mini-lectures
- 2) Guest presentations
- 3) Textbook and supplementary materials are required reading and are essential to successful solution of homework problems
- 4) Students are strongly encouraged to form study groups as well as to seek help through peer tutoring and instructor office hours.
- 5) Individual & group work done at board

Out-of-Class Assignments

- 1) Reading and homework problems, as assigned in CHEM 102 course, used as class discussion topics
- 2) Completion of lab reports, as assigned in CHEM 102 course, used as class discussion topics
- 3) Written reflections which may involve internet research related to (2) careers and the courses of study in STEM disciplines, (2) reading assignments, and (3) personal study habits, among others

Texts and References *These books are required in CHEM 102

- 1) Required (representative examples):
 - a. Timberlake, *An Introduction to General, Organic & Biological Chemistry*. 5th edition. Prentice Hall, 2015.
 - b. LeBlanc and Villarreal. CHEM 102 Lab Manual. Morton, 2019.
- 2) Supplemental: None

Student Learning Outcomes

Students having successfully completed this course exit with the following skills, competencies and/or knowledge:

- 1) Satisfactorily complete the tasks, master the skills and understand the concepts required for success in CHEM 102 through the reinforced instruction of this course along with students' independent study.
- 2) Develop & utilize organizational, technical, and study skills obtained in this course to prepare for and succeed in CHEM 102 assignments, quizzes and exams.
- 3) Successfully improve technical, reading, and writing skills to produce clear, articulate and complete lab reports and written assignments.