

Crafton Hills College

Course Outline

1. Discipline Chemistry
2. Department Biological Sciences and Chemistry
3. Course Title Problem Solving and Study Skills for Chemistry
4. Course I.D. **CHEM 087**
5. Prerequisite(s) MATH 090 or eligibility for MATH 095 as determined through the Crafton Hills College assessment process.

Corequisite(s) CHEM 101

Department Recommendation(s) None

6. Semester Units: 1 Unit

7. Minimum Semester Hours

Lecture: 16 Lab: 0 Clinic: 0 Field: 0

8. Need for Course:

Chemistry 087 is a course for students concurrently enrolled in Chemistry 101. This course will enhance the chemistry program at Crafton Hills College by providing students who feel they need additional help with problem solving and critical thinking skills necessary for the successful completion of CHEM 101. Will apply as elective credit to associate degree. Does not apply to major credit.

9. Goals for the Course:

Chemistry 087 enhances the Chemistry Department offerings by presenting students with additional problem solving and critical thinking skills necessary for the successful completion of CHEM 101. It gives the student supplementary practice with chemistry word problems, calculations and problem solving. The course teaches the fundamentals of the scientific method and analysis and how to apply that to critical thinking and problem solving.

10. Catalog Description:

Discussion and problem solving sessions to be taken in conjunction with CHEM 101. A review of study skills and techniques for mastery of chemistry principles and test taking strategies. Algebra review with an emphasis on how to use mathematics and algebra to solve chemistry problems. Builds off of CHEM 101 material. Graded on Credit/No credit basis only.

11. Entrance Skills:

A. Requisite Skills:

Upon entering the course, students must be able to:

1. Solve single variable algebraic problems.
2. Identify and use the properties of real numbers.
3. Perform the operations of addition, subtraction, multiplication, and division on polynomials (with whole number exponents).
4. Perform the four arithmetic operations with signed numbers.

B. Recommended Skills: None

12. Course Objectives:

Upon completion of the course, students will be able to:

A. Apply critical thinking skills to solve problems of a scientific nature, which may include:

1. Chemical reactions and equations
2. Atomic theory
3. Chemical bonding
4. Gas law theories
5. Acid and base chemistry theory

B. Apply algebra skills and strategies to solve chemistry problems, which may include:

1. The metric system
2. The mole concept
3. Percent composition of elements in a compound
4. Empirical and molecular formulas

5. Stoichiometry calculations
6. Gas law calculations
7. Solution concentrations

- C. Demonstrate test-taking strategies.
- D. Employ successful study skills.

13. Representative Texts and Instructional Materials:

Lecture Text:

Ball, David, (1996). Essential Math for Chemistry Students. New York: Brooks/Cole.

Gleason, Walter, (1993). Is Your Math Ready For Chemistry?. Boston: McGraw Hill.

Drewes, Frederick, (1996). How To Study Science. (2nd ed.). Boston: McGraw Hill.

Nolting, Paul, (2000). Math Study Skills Workbook. Boston: Houghton Mifflin

Chiras, Daniel, (2000). Essential Study Skills for Science Students. United States: Brooks/Cole.

14. Course Content:

- A. Test taking strategies
- B. Study skills
- C. Numbers, units and scientific notation
- D. Dimensional analysis
- E. Significant figures
- F. Unit conversions; metric to metric, U.S. to metric
- G. Molar mass as a conversion factor.
- H. Chemical reactions used as conversion factors
- I. Chemistry mathematical formulas
- J. Graphing

15. Methods of Instruction:

- A. This course combines lecture, class discussions, problem solving, and reading assignments.
- B. Students will work both individually and in small groups for problem solving.

16. Assignments and Methods of Evaluation:

The students are required to attend every class and be an active participant. Students will lose points for not attending and/or participating.

- A. Classroom participation and class assignments
(Approximately 90% of total points)
- B. Quizzes and homework assignments
(Approximately 10% of total points)

The student's grade is based upon the percentage of the total points that they have earned during the semester. The Course is Credit/No Credit only

70% to 100% of possible points	Credit
69% or Lower of possible points	No Credit