

CHEM 100

Chemistry and Its Role in Society

3 Credits

Community College of Baltimore County

Common Course Outline

Description

CHEM 100 – Chemistry and Its Role in Society: illustrates how chemistry is intimately involved in many aspects of our lives and explores areas of interaction between chemistry and human society including chemistry of the earth, chemistry of the atmosphere, polymers, medicine, food, household chemicals, and energy. This is a course intended for students not planning to enroll in a higher-level chemistry course. For students needing a lab, CHEM 102: Laboratory for Chemistry and Its Role in Society, serves as the accompanying lab.

Pre-requisites: ACLT 052 or ACLT 053 (ESOL 052 and ESOL 054) and MATH 082

Overall Course Objectives

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

1. describe the characteristics of science and the use of the scientific method as a way of gaining knowledge;
2. describe the difference between observations, hypotheses, scientific laws, and theories;
3. convert between the metric system and English system;
4. demonstrate proper rounding to a certain number of significant figures;
5. create graphs in order to present data, extract quantitative information, and make predictions;
6. describe Dalton's atomic theory and how it has evolved since the discovery of electricity, isotopes, and atomic particles;
7. describe the structure of atoms and their component parts;
8. give examples of radioactivity, alpha particles, beta particles, and gamma radiation;
9. explain the concept of half-life and how it has been used to date materials;
10. apply the Law of Conservation of Mass to balancing chemical equations;
11. describe the properties associated with the three basic states of matter: solids, liquids, and gases;
12. determine the concentration of a solution;
13. utilize the periodic table to predict the properties of elements and compounds;
14. describe the general properties of organic compounds;
15. identify the general structural features and properties of carbohydrates, fats, and proteins;
16. describe the chemistry behind everyday household substances and their potential use and misuse by societies;

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For more information, see your professor's syllabus.

17. describe the chemical features of common drugs and medicine to examine chemistry's role in their development;
18. discuss ethical relationships between chemistry and societal and environmental problems such as health, use of fossil fuels, use of nuclear energy, air pollution, and water pollution;
19. explain how the First and Second Laws of Thermodynamics relate to energy use;
20. perform mole and mass calculations; and
21. find, evaluate, use and cite appropriate academic resources and documents, including print and digital media, to gather and evaluate physical and chemical data.

Major Topics

- I. Science and Chemistry
- II. Matter and Energy
- III. Measurement
- IV. Atoms and Atomic Structure
- V. Periodic Table
- VI. Chemical Bonding: Ionic and Covalent Bonds
- VII. Chemistry of the Atmosphere
- VIII. Chemistry of the Earth and Water
- IX. Organic Chemistry
- X. Polymers
- XI. Food Chemistry
- XII. Household Chemicals
- XIII. Drugs and Medicine
- XIV. Energy Production (The First and Second Laws of Thermodynamics)

Course Requirements

Grading will be determined by the individual faculty member, but shall include the following, at minimum:

- three exams including a comprehensive final exam
- ten homework assignments
- ten quizzes

Written assignments and research projects: Students are required to use appropriate academic resources in their research and cite sources according to the style selected by their professor.

Other Course Information

This course is an approved 3-credit General Education course in the Biological and Physical Sciences but does not fulfill the laboratory requirement.

One or more assignments will infuse CCBC General Education Program outcomes and will account for a minimum of 10% of the total course grade. The assignment(s) will allow students to demonstrate at least 5 of the 7 General Education program outcomes.

Successful completion of this course and the companion laboratory (CHEM 102) fulfills the lecture and laboratory requirement and equals 4 credits.

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