

Common Course Outline
CHEM 135
Chemistry Topics for Engineering
1 Credit

Community College of Baltimore County

Description

CHEM 135 – Chemistry Topics for Engineering introduces the study of phase changes, crystalline solids and semiconductors, chemical kinetics, chemical equilibria (of gases, weak acids and bases, and solubility), electrochemistry, and organic chemistry. Emphasis is placed on problem solving and application.

1 Credit: 1 lecture hour and 1 recitation hour per week

Prerequisite: CHEM 131 (formerly CHEM 121/122) with a minimum grade of C.

Overall Course Objectives

Upon completion of this course students will be able to:

1. describe intermolecular forces;
2. interpret phase diagrams;
3. discuss colligative properties;
4. predict the order of a chemical reaction;
5. determine rate expressions including integrated rate expressions of chemical reactions;
6. calculate the activation energy of a chemical reaction;
7. apply equilibrium concepts to calculate equilibrium constants and equilibrium concentrations of gases, weak acids and bases, and ions;
8. use thermodynamic quantities (ΔH , ΔS , and ΔG) to predict the spontaneity of a chemical reaction;
9. describe galvanic and electrolytic electrochemical cells;
10. use the Nernst equation to determine voltage under nonstandard conditions;
11. discuss the use of solids and modern materials including semiconductors;
12. name various classes of organic compounds; and
13. discuss (briefly) organic reactions and isomerism.

Major Topics

- I. Intermolecular Forces and Phase Changes
- II. Colligative Properties
- III. Chemical Equilibria: Gases, Weak Acids and Bases, and Solubility
- IV. Chemical Kinetics
- V. Electrochemistry
- VI. Solids and Modern Materials
- VII. Introduction to Organic Chemistry

Course Requirements

Grading procedures will be determined by the individual faculty member but will include the following:

Grading/exams

- electronic homework for each chapter
- a minimum of one semester exam
- a research project (dealing with application of chemistry to engineering)
- a cumulative final exam

Written Assignments: Students are required to use appropriate academic resources.

Other Course Information

CHEM 135 is intended for students transferring to certain engineering programs at the University of Maryland, College Park (UMCP). CHEM 135 along with CHEM 131 is equivalent to General Chemistry for Engineers offered at some 4-year institutions, such as UMCP and Morgan State University.

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