



# Alabama Community College System

## CHM 112 College Chemistry II

### **I. CHM 112 College Chemistry II—4 Semester Hours**

### **II. Course Description**

This is the second course in a two-semester sequence designed primarily for the science and engineering student who is expected to have a strong background in mathematics. Topics in this course include solutions and colloids, chemical kinetics, chemical equilibria, acids and bases, ionic equilibria of weak electrolytes, chemical thermodynamics, electrochemistry, oxidation-reduction, nuclear chemistry, and selected topics in descriptive chemistry including an introduction to organic chemistry and biochemistry, atmospheric chemistry, coordination compounds, transition compounds, post-transition compounds, metals, nonmetals, and semi-metals, Laboratory is required.

### **III. Prerequisite**

Grade of “C” or higher in both CHM 111 (College Chemistry I) and MTH 112 (Precalculus Algebra)

### **IV. Textbook**

Due to the varied selection of quality college-level textbooks, each college will select the textbook needed to meet the requirements of this course.

### **V. Course Learning Outcomes**

By the end of the course, students will be able to:

1. apply the fundamental concepts related to solutions and colloids;
2. apply the fundamental concepts of chemical kinetics;
3. identify and compare Arrhenius, Bronsted-Lowry, and Lewis acids and bases;
4. demonstrate knowledge of the general concepts of equilibrium systems;
5. predict energetics and spontaneity of chemical reactions and phase transitions;
6. demonstrate knowledge of the concepts of electrochemistry;
7. solve problems related to solutions, kinetics, equilibria, pH, titration, solubility, thermodynamics, electrochemistry, and nuclear chemistry, using dimensional analysis and appropriate equations;

8. demonstrate proper lab techniques and safety in the performance of common experiments in chemistry; and
9. apply scientific reasoning to interpret experimental data.

## **VI. Course Outline of Topics**

### Lecture Topics:

1. Liquids and solids
2. Solutions and colloids
3. Chemical kinetics
4. Chemical equilibrium
5. Acids and bases
6. Aqueous equilibria
7. Thermodynamics
8. Electrochemistry
9. Nuclear chemistry

### Optional Lecture Topics

1. Organic chemistry
2. Biochemistry
3. Main group elements
4. Transition metals

### Lab Topics

1. Lab Safety
2. Graphical analysis of data
3. Colligative properties
4. Kinetics
5. Equilibrium
6. pH measurement
7. Titrations
8. Electrochemistry
9. Thermodynamics
10. Qualitative analysis

### Optional Lab Topics:

1. Organic compounds
2. Polymers

## **VII. Evaluation and Assessment**

Grades will be given based upon A = 90 – 100%, B = 80 – 89%, C = 70 – 79%, D = 60 – 69%, and F = below 60%.

### **VIII. Attendance**

Students are expected to attend all classes for which they are registered. Students who are unable to attend class regularly, regardless of the reason or circumstance, should withdraw from that class before poor attendance interferes with the student's ability to achieve the objectives required in the course. Withdrawal from class can affect eligibility for federal financial aid.

### **IX. Statement on Discrimination/Harassment**

It is the official policy of the Alabama Community College System and entities under its control, including all Colleges, that no person shall be discriminated against on the basis of any impermissible criterion or characteristic, including, without limitation, race, color, national origin, religion, marital status, disability, sex, age, or any other protected class as defined by federal and state law. (ACCS Policies 601.02 and 800.00)

### **X. Americans with Disabilities**

*The Rehabilitation Act of 1973 (Section 504) and the Americans with Disabilities Act of 1990* state that qualified students with disabilities who meet the essential functions and academic requirements are entitled to reasonable accommodations. It is the student's responsibility to provide appropriate disability documentation to the College.