

Coffeyville Community College

#CHEM-104

COURSE SYLLABUS

FOR

**PRINCIPLES OF CHEMISTRY II
& QUALITATIVE ANALYSIS**

**Amy Lumley
Instructor**

COURSE NUMBER: CHEM-104

COURSE TITLE: Principles of Chemistry II & Qualitative Analysis

CREDIT HOURS: 5

INSTRUCTOR: Amy Lumley

OFFICE LOCATION: Room 202B, Chemistry Lab, Arts and Sciences Building

PHONE: 620-251-7700 ext. 2180

OFFICE HOURS: See schedule posted on office door

PREREQUISITE(S): Principles of Chemistry I

REQUIRED TEXT AND MATERIALS: Brady. Chemistry: Matter and Its Changes. Fourth Edition
Calculator

**COURSE
DESCRIPTION:**

A continuation of Principles of Chemistry I. Topics include oxidation-reduction, acid-bases, kinetics, equilibrium, ionization, solubility product, thermodynamics, electrochemistry, organic and nuclear reactions.

**EXPECTED LEARNER
OUTCOMES:**

Upon completion of this course, the student will be able to:

1. Understand intermolecular forces
2. List the properties of mixtures
3. Describe periodic patterns in the main-group elements
4. Understand organic compounds and the atomic properties of carbon
5. Apply kinetics
6. Discuss equilibrium
7. Understand acid-base equilibria
8. Apply ionic equilibria in aqueous systems
9. Understand thermodynamics
10. Explain electrochemistry
11. List the elements in nature and industry
12. Understand the transition elements
13. Predict nuclear reactions

**LEARNING TASKS
& ACTIVITIES:**

The class will meet during the scheduled class time for lecture and discussion. The class will meet on Tuesdays to write up the labs, discuss the procedures for the lab, and work out any problems from the previous lab. The class will meet on Thursdays for the experimentation.

Other activities will include:

1. Videos
2. Library Research
3. Class Presentations
4. Problem Solving Units
5. Model Building
6. Transparencies
7. Graphing
8. Group Discussion
9. Mini-Unit Presentations

**ASSESSMENT OF
OUTCOMES:**

The following evaluative techniques will be used:

1. Lecture Exams
2. Lab Assignments
3. Lab Quizzes
4. Lecture Quizzes
5. Lab Notebook
6. Homework Assignments
7. Research Paper
8. Lecture Final
9. Lab Final

**EVERY ASSIGNMENT WILL BE GRADED, RECORDED,
AND FILED.**

All assignments will be assigned points. At the end of the semester, your total points will be divided by the total possible to arrive at a percentage. The grading scale is as follows:

90-100%	A
80-89%	B
70-79%	C
60-69%	D
0-59%	F

**ATTENDANCE
POLICY:**

Each student is required to attend all lectures, discussions, and labs. Attendance will be taken daily. It is the responsibility of the student to make definite arrangements with the instructor for make-up work **before** going on a field trip or other college-sponsored events. If a student does not make up the missed work within a week, a **ZERO** will be assigned to the missed work. Only excused absences will be accepted for make-up work.

**ACADEMIC
INTEGRITY:**

Dishonesty of any kind on examinations or on written assignments will render the offender liable to serious consequences such as a zero and possibly suspension from the class. The following are dishonest procedures:

1. Illegal possession of the exam
2. Use of unauthorized notes during an exam
3. Obtaining information from the book, notes, or others during an exam
4. Assisting others to cheat
5. Alteration of grade records
6. Illegal entry or unauthorized entry into office
7. Offering the work of another as one's own

**OTHER
POLICIES:**

Classroom accommodations will be made for students with disabilities at the request of the student. Other policies may be instituted as needed.

HAVE A WONDERFUL EXPERIENCE IN CHEMISTRY.

COMPETENCIES:

UNDERSTAND INTERMOLECULAR FORCES

1. Understand physical states and phase changes.
2. Read phase diagrams.
3. Identify types of intermolecular forces.
4. Know the properties of the liquid state.
5. Understand the uniqueness of water.
6. Know the structure and properties of the solid state.

LIST THE PROPERTIES OF MIXTURES

1. Differentiate types of solutions.
2. Understand the energy changes in the solution process.
3. Understand solubility as an equilibrium process.
4. Express concentration quantitatively.
5. Understand colligative properties.
6. Understand the structure and properties of colloids.

DESCRIBE PERIODIC PATTERNS IN THE MAIN-GROUP ELEMENTS

1. Understand the periodic trends and characteristics of the main-group elements.

UNDERSTAND ORGANIC COMPOUNDS AND THE ATOMIC PROPERTIES OF CARBON

1. Understand the nature of carbon.
2. Know the structures and classes of hydrocarbons.
3. Understand some important classes of organic reactions.
4. Understand the properties and reactivities of common functional groups.
5. Understand monomers and polymers.

APPLY KINETICS

1. Understand the factors that influence reaction rates.
2. Be able to express reaction rates.
3. Use the rate law.
4. Understand reaction mechanisms.
5. Understand catalysis.

DISCUSS EQUILIBRIUM

1. Understand the reaction quotient and equilibrium constant.
2. Solve equilibrium problems.
3. Understand Le Chatelier's Principle.

UNDERSTAND ACID-BASE EQUILIBRIA

1. Understand acids and bases in water.
2. Use the pH scale.
3. Define Bronsted-Lowry acids and bases.
4. Find K_a and equilibria concentrations.
5. Understand weak acids and bases.
6. Understand acid strength and molecular properties.
7. Understand the acid-base properties of salt solutions.
8. Define Lewis acids and bases.

APPLY IONIC EQUILIBRIA IN AQUEOUS SYSTEMS

1. Understand the equilibria of acid-base buffer systems.
2. Interpret acid-base titration curves.
3. Use the ion-product expression and the solubility-product constant.
4. Apply ionic equilibria to chemical analysis.

UNDERSTAND THERMODYNAMICS

1. Explain the Second Law of Thermodynamics.
2. Calculate enthalpy changes of a reaction.
3. Perform calculations involving entropy, free energy, and work.

EXPLAIN ELECTROCHEMISTRY

1. Use the half-reaction method for balancing redox reactions.
2. Understand voltaic cells and cell potential.
3. Understand electrochemical processes.

LIST THE ELEMENTS IN NATURE AND INDUSTRY

1. Understand the nature and uses of the elements.

UNDERSTAND THE TRANSITION ELEMENTS

1. Understand the nature and uses of the transition elements.
2. Understand coordination compounds.

PREDICT NUCLEAR REACTIONS AND THEIR APPLICATIONS

1. Understand radioactive decay and nuclear stability.
2. Understand nuclear fission and fusion.

This syllabus is subject to revision with prior notification to the student by the instructor.