

SYLLABUS
PART I
EDISON COMMUNITY COLLEGE
CHM 122S GENERAL CHEMISTRY II
5 CREDIT HOURS

COURSE DESCRIPTION

Continuation of General Chemistry I including states of matter and intermolecular attractive forces, properties of solutions, chemical thermodynamics, chemical equilibrium, acid-base theories and equilibria, redox reactions, pH, chemical kinetics, and electrochemistry. Course consists of three hours lecture and four hours recitation/lab per week. Prerequisite: CHM 121S. Co-requisite: MTH 122S. Lab fee.

COURSE GOALS

The student will:

Bloom's Level		Gen Ed Outcomes
3	1. Describe the types of intermolecular attractive forces, explain why they exist, and use them to explain the behavior of matter.	1
2	2. Differentiate the types of intermolecular attractive forces that exist in specific substances and predict their effect on the properties of substances.	1
3	3. Apply knowledge of the physical properties of solids and liquids and phase changes.	1
3	4. Describe the different types of crystals that exist and predict the type of crystalline solid formed by chemical compounds.	1
3	5. Apply basic principles to explain the behavior of solutions and perform colligative property calculations.	1, 3
5	6. Apply a basic understanding of chemical thermodynamics, including enthalpy, entropy, and free energy, to solve problems and explain specific examples.	1, 3
3	7. List chemical equilibrium principles, apply Le Chatelier's principle to predict the effects various changes on chemical equilibria, and solve problems involving chemical equilibria.	1, 3
3	8. Use the Bronsted-Lowry and Lewis acid-base theories to explain acid-base phenomena.	1
3	9. Solve problems involving pH, ionization of strong and weak acids and bases, weak acid-base equilibria, buffers, hydrolysis of salts, and acid-base titrations.	1, 3
3	10. Solve problems involving solubility equilibria and K_{sp} , and describe factors that affect solubility.	1, 3
3	11. Use the principles of chemical kinetics including reaction rates, rate laws, and mechanisms of chemical reactions to explain phenomena and solve problems.	1, 3
3	12. Write and balance redox reactions.	1, 3
3	13. Apply knowledge of electrochemistry and electrochemical reactions including reduction potentials and cell potentials.	1, 3
3	14. Demonstrate knowledge of periodic patterns of chemical reactivity and chemical properties and apply these when performing qualitative analysis experiments.	1

3	15. Demonstrate skill in using quantitative laboratory equipment to perform accurate quantitative analysis experiments.	1
4	16. Organize and clearly present data, draw and use graphs, apply basic statistics to evaluate laboratory data, and produce lab reports which are clear, concise, and accurately analyze the results of the experiment.	1, 2, 3
3	17. Work effectively in groups.	5

CORE VALUES

The Core Values are a set of principles that guide in creating educational programs and environments at Edison. They include communication, ethics, critical thinking, human diversity, inquiry/respect for learning, and interpersonal skills/teamwork. The goals, objectives, and activities in this course will introduce/reinforce these Core Values whenever appropriate.

TOPIC OUTLINE

1. Intermolecular attractive forces and their relationship to the physical properties of substances, changes of state
2. Crystalline and noncrystalline solids, types of crystals
3. Solutions, solution formation, solution concentration units, colligative properties
4. Chemical thermodynamics, enthalpy, entropy, free energy, spontaneity of processes
5. Chemical equilibrium, the equilibrium constant, Le Chatelier's principle, equilibrium calculations
6. Bronsted-Lowry and Lewis acid-base theories, strengths of acids and bases.
7. Ionization of water, pH, ionization of strong and weak acids and bases, weak acid and base equilibria, buffers, hydrolysis of salts, acid-base titrations, indicators, solubility equilibria and K_{sp}
8. Chemical kinetics, reaction rates, rate laws, mechanisms of chemical reactions
9. Redox reactions, electrochemistry, reduction potentials, cell potentials
10. Chemical properties, chemical reactivity, qualitative analysis