SYLLABUS
PART I
EDISON COMMUNITY COLLEGE
CHM 121S GENERAL CHEMISTRY I
5 CREDIT HOURS

COURSE DESCRIPTION
Fundamental concepts, principles, and theories of chemistry. Scientific measurement, chemical formulas and equations, chemical nomenclature, the mole, molarity, stoichiometry, metathesis and redox reactions, acid-base theory, electronic structure of atoms, chemical bonding, molecular structure and thermochemistry. Class consists of three hours lecture and four hours recitation/lab per week. Prerequisite: high school chemistry or CHM 110S; and two years of high school algebra or MTH 097D. Lab fee.

COURSE GOALS

The student will:

Bloom's Level		Gen Ed Outcomes
3	1. List the basic metric units and prefixes and solve unit conversion problems involving metric units.	1, 3
3	2. Describe and use the concepts of matter, elements, compounds, mixtures, solutions, and laws of composition.	1, 3
3	3. Use chemical symbols, chemical formulas, and chemical equations to answer questions and solve problems.	1, 3
3	4. Explain and use the mole concept, atomic weights, molecular weights, and molar masses.	1, 3
3	5. Solve problems involving empirical formulas, percentage composition, and molecular formulas.	1, 3
3	6. Solve stoichiometry problems which require the use of a chemical formula or a chemical equation to obtain the necessary relationship between the chemicals involved.	1, 3
3	7. Define the term molarity, solve problems involving molarity, solve dilution problems involving molarity, and solve stoichiometry problems involving molar solutions.	1, 3
3	8. Describe and apply the basic concepts of Arrhenius acid-base theory.	1
3	9. Explain and apply the concepts of oxidation, reduction, and oxidation numbers.	1
3	10. Write and balance metathesis, Arrhenius acid-base, and redox equations.	1
1	11. Describe the historical development of atomic structure and the periodic table.	2
5	12. Describe the wave mechanical model of the atom, the quantum numbers and their meanings, electron configurations, and orbital diagrams, and apply these concepts to evaluate and explain specific questions about the electronic structures and properties of atoms and ions.	1
3	13. Use the periodic table to answer questions about classification and reactivity of the elements, periodic properties of the elements, atomic structure, electron configurations, and atomic properties.	1
3	14. Apply ionic and covalent bonding concepts to predict whether given	1

	elements will form ionic or covalent compounds when they react and predict 1the chemical formulas or Lewis dot structures of compounds formed.	
3	15. Apply valence bond and molecular orbital theories to evaluate and explain the bonding in molecules and use Valence Shell Electron Pair Repulsion Theory to predict molecular geometries and shapes of molecules or ions.	1
3	16. Explain the basic concepts of thermochemistry including heats of reaction, Hess' law, and standard enthalpies of formation and use these concepts to solve problems.	1, 3
4	17. 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 accurate assessments of the results of the experiment.	1, 2, 3
3	18. Follow written laboratory procedures, manipulate equipment and chemicals competently; demonstrate skill in performing common laboratory techniques, and work with others in group.	5

CORE VALUES

The Core Values are a set of principles which 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. Scientific measurement, significant figures
2. Matter and its properties
3. Elements, compounds, atomic theory, chemical symbols and equations, classification and properties of the elements
4. The mole concept
5. Stoichiometry calculations
6. Molarity and solution stoichiometry
7. Metathesis, redox, and acid-base reactions.
8. Development of atomic theory and the periodic table
9. The wave mechanical model of the atom and quantum numbers
10. Electron configurations and orbital diagrams
11. Periodic properties of the elements and their relationship to electron configurations and the periodic table.
12. Ionic and covalent compounds and their properties.
13. Ionic and covalent bonding
14. Lewis dot structures of molecules and ions
15. Valence bond and molecular orbital theories
16. Molecular geometries and shapes
17. Thermochemistry, enthalpy, Hess' law, heats of reaction