

SYLLABUS
PART I
EDISON COMMUNITY COLLEGE
CHM 111S BASIC CHEMISTRY OF LIFE PROCESSES
3 CREDIT HOURS

COURSE DESCRIPTION

Introduction to the chemistry within living organisms. Review of acids, bases, and bonding. Survey of organic chemistry and biochemistry. Solutions, important types of organic molecules and selected reactions, structures and functions of carbohydrates, proteins, lipids, and nucleic acids. Designed for students in health technologies. Class consists of 3 hours lecture per week. Prerequisite: One year of high school chemistry or CHM 110S.

COURSE GOALS

The student will:

Bloom's Level		Gen Ed Outcomes
3	1. Apply knowledge of acids and bases to complete and balance acid and base ionization and neutralization equations, explain what acidic, neutral and basic solutions are and how they are related to pH, and describe how buffers function.	1, 2, 5
1	2. Identify given molecular structures as being alkanes, alkenes, alkynes, alcohols, ethers, aldehydes, ketones, carboxylic acids, esters, amines or amides.	1, 2, 5
3	3. Apply organic chemistry naming procedures to name alkanes, alkenes, alkynes, alcohols, and ethers.	1, 2, 5
3	4. Complete selected organic reactions involving alkanes, alkenes, alkynes, carboxylic acids, esters, amines, and amides given the structures of the reactant molecules.	1, 2, 5
1	5. Describe monosaccharides, disaccharides, and polysaccharides and their structures, list their roles, and explain why different enzymes are needed to digest different disaccharides and polysaccharides.	1
3	6. Describe the structures and roles of fatty acids, triacylglycerols, and steroids and complete equations involving reactions of triacylglycerols.	1
3	7. Draw the structure of an amino acid, connect amino acids by peptide bonds, describe the primary, secondary, tertiary, and quaternary structures of proteins, and describe how the structure of a protein is held together.	1, 2, 5
1	8. Define the term enzyme; apply the classifications of enzymes to specific examples. Describe the factors that influence the activity of enzymes, and describe the roles of metal ions and vitamins in enzyme function.	1, 2, 5
3	9. Describe the structures of DNA and RNA, describe DNA replication, apply the genetic code to determine the primary structure of a protein that results from a given DNA or mRNA sequence, and explain what mutations are and their relationship to genetic diseases.	1, 2, 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. Acids, bases, salts, buffers, pH.
2. Survey of organic chemistry including alkanes, alkenes, alkynes, alcohols, ethers, aldehydes, ketones, carboxylic acids, esters, amines, and amides.
3. Carbohydrate structures and properties: monosaccharides, disaccharides, polysaccharides.
Lipids: types and uses.
5. Amino acids, peptide bonds, protein structures and functions.
6. Nucleic acids, DNA structure and replication, protein synthesis, mutations, genetic diseases.
7. Enzyme action, types of enzymes, factors which affect enzyme activity.