SPRINGFIELD TECHNICAL COMMUNITY COLLEGE

ACADEMIC AFFAIRS

Course Number: CHEM 320 Department: Chemistry

Course Title: Organic Chemistry I Semester: Spring Year: 1999

Objectives/Competencies

Course Objective	Competencies
1. Be able to recognize the class of organic compound from its molecular structure.	1. Interpret Lewis dot structures. 2. Identify the functional group of a specific organic compound.
2. Give a common name or IUPAC name to a compound based on its structure.	1. Recognize functional group. 2. Find longest continuous chain. 3. Identify branching and position along main chain. 4. Know proper ending of name based on IUPAC rules of nomenclature.
3. Draw the structure of a compound from its IUPAC name.	1. Be able to draw Lewis dot structures. 2. Draw longest continuous chain. 3. Position proper side groups along chain. 4. Place proper functional group in correct position. 5. Know cis-trans isomerism.
4. Be familiar with the physical and chemical properties of the most common of the organic compounds.	1. Know electronegativity of the elements. 2. Identify type of bonds.

Course Objective	Competencies
	3. Recognize polarity within molecules by bond dipole and dipole moment. 4. Recognize formal charges on specific atoms on a molecule. 5. Be aware of the important intermolecular forces that control physical properties.
5. Write a proper mechanism for a specific organic chemical reaction.	1. Identify the charges within the molecule of substrate and reagent. 2. Know how to use arrows to show movement of electrons within molecules. 3. Use arrows to show bonds breading and forming. 4. Understand carbocation stability.
6. Understand the stereochemistry of chiral molecules.	1. Recognize a chiral center. 2. Calculate the number of possible stereoisomers based on the number of chiral centers. 3. Draw Fisher projections a stereoisomer. 4. Identify enantiomeric relationships. 5. Identify diastereomeric relationships. 6. Assign R and S configurations for chiral carbons. 7. Be familiar with concepts of optical activity of chiral moleculres. 8. Recognize a plane of symmetry within a meso compound.
7. Appreciate the unique properties of organic ring structures.	1. Draw chair conformations for cyclohexane. 2. Identify axial and equatorial positions.

Course Objective	Competencies
	3. Recognize ring strain in cycloalkanes. 4. Be familiar with 1-3 diaxial interactions.
8. Know the most common reactions that organic compounds undergo.	1. Be familiar with Sn1 and Sn2 reactions. 2. Recognize nucleophile and substrate. 3. Be familiar with E1 and E2 reactions. 4. Recognize base and substrate. 5. Understand free radical reactions. 6. Show initiation, propagation and termination steps for free radical reactions. 7. Be familiar with the thermodynamics and kinetics of chemical reactions. 8. Draw potential energy diagrams for exothermic and endothermic reactions.
9. Plan a synthetic pathway to produce a compound starting with specific starting reagents.	1. Know the basic reactions of the most common organic compounds. 2. Know the reagents needed for each reaction. 3. Plan the sequence needed for the specific reactions that will produce the desired compound.
10. Become familiar with the most common laboratory techniques as they relate the synthesis, isolation, purification and the identification of organic compounds.	1. Microscale and macroscale techniques of the following: a. Boiling points of liquids and melting points of solids. b. Measure the refractive index of a liquid for identification and measure of purity. c. Distillation of liquids. d. Methods of reflux techniques.

Course Objective	Competencies
	e. Extraction techniques. f. Recrystallization techniques. g. Sublimation techniques.