

## LABETTE COMMUNITY COLLEGE BRIEF SYLLABUS

### **SPECIAL NOTE:**

This brief syllabus is not intended to be a legal contract. A full syllabus will be distributed to students at the first class session.

### **TEXT AND SUPPLEMENTARY MATERIALS USED IN THE COURSE (if any):**

Please check with the LCC bookstore, <http://www.labette.edu/bookstore>, for the required texts for this class.

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| <b><u>COURSE NUMBER:</u></b>          | CHEM 204                       |
| <b><u>COURSE TITLE:</u></b>           | ORGANIC CHEMISTRY I            |
| <b><u>SEMESTER CREDIT HOURS:</u></b>  | 5 Credit Hours                 |
| <b><u>DEPARTMENT:</u></b>             | Chemistry Department           |
| <b><u>DIVISION:</u></b>               | General Education              |
| <b><u>PREREQUISITE:</u></b>           | CHEM 124, College Chemistry I  |
| <b><u>RECOMMENDED ADDITIONAL:</u></b> | CHEM 126, College Chemistry II |
| <b><u>REVISION DATE:</u></b>          | 2/2017                         |

### **COURSE DESCRIPTION**

First course of a two semester study of the principles of organic chemistry. Course content includes organic nomenclature, reaction mechanisms, elimination and substitution, and stereochemistry. Classes of compounds include alkanes, alkenes, ethers, alcohols and thiols.

### **COURSE AND COMPETENCIES (LECTURE)**

**Students who successfully complete this course will be able to:**

1. Explain bonding and shapes of molecules (chapter 1); Name and explain the structures and reactions of alkanes and cycloalkanes (chapter 2)
  - (Review) Explain and write electronic structures, Lewis structures, predict 3-D structures using the VSEPR model and polarity of molecules.
  - (Review) Explain bonding theory.
  - Identify and write functional groups.
  - Explain and write resonance structures.
  - Identify and draw the structure of and name alkanes, cycloalkanes, and bicycloalkanes.
  - Explain the physical properties of alkanes.
  - Explain the sources and reactions (including mechanisms) of alkanes.

2. Explain and identify Bronsted-Lowry and Lewis acids and bases. (chapter 3); Explain stereoisomerism (chapter 4)

- (Review) Explain the definitions of Bronsted-Lowry and Lewis acids and bases.
- Calculate acid and base strength.
- Determine the position of equilibria for acid-base reactions.
- Explain and compare types of isomers.
- Explain and identify chirality, enantiomers, diastereomers, and meso compounds.
- Explain and draw Fischer projection formulas.
- Explain optical activity, Cahn-Ingold-Prelog system, and E-Z system.
- Explain how to separate enantiomers and the significance of chirality in biological compounds.

3. Name and explain the structures, properties, and reactions of alkenes (chapter 5); Explain the reactions of alkyl halides (chapter 6)

- Name and draw the structures of alkenes.
- Identify and explain the properties of alkenes.
- Explain and write reactions of alkenes.
- Explain the mechanisms of alkene reactions.
- Explain isomerism and alkene reactions.
- Identify and draw the structure of and name alkyl halides.
- Explain the physical properties of alkyl halides.
- Explain the reactions including mechanisms of alkyl halides

4. Write reactions, compare, and predict nucleophilic substitution and elimination reactions (chapter 7); Name, draw the structures and explain the reactions of alcohols & thiols (Chapter 8).

- Compare and write the reactions for  $S_N1$  and  $S_N2$  reactions.
- Compare and write the reactions for E1 and E2 reactions
- Compare and predict nucleophilic substitution with elimination reactions
- Identify, draw the structure of and name alcohols and thiols.
- Explain the physical properties of alcohols and thiols.
- Explain the reactions including mechanisms of alcohols and thiols.

5. Name, draw the structures & explain the reactions of ethers (Chapter 9).

- Identify, draw the structure of and name ethers.
- Explain the physical properties of ethers.
- Explain the reactions including mechanisms of ethers.

**(LABORATORY)**

**6. DEMONSTRATE COMPETENCIES IN LABORATORY TECHNIQUES.**

- Describe or demonstrate the following laboratory techniques; melting point determination with a Mel-Temp, extraction with a separatory funnel, simple and fractional distillation, recrystallation, using a barometer, synthesis of new compounds, and maintaining a laboratory notebook

**7. SHOW GREATER UNDERSTANDING IN CONCEPTS THAT CORRELATE WITH THOSE IN THE LECTURE.**

- Show understanding of the following concepts; covalent bonding and shapes of molecules, acids and bases, stereochemistry, substitution of an alkyl halide.