

# Bemidji State University

## CHEM 3311: Organic Chemistry I

### A. COURSE DESCRIPTION

Credits: 3

Lecture Hours/Week: \*.\*

Lab Hours/Week: \*.\*

OJT Hours/Week: \*.\*

Prerequisites: None

Corequisites: None

MnTC Goals: None

A study of the properties of aliphatic and aromatic compounds and the theories and mechanisms to account for those properties. Prerequisite: CHEM 1112 or CHEM 2212.

**B. COURSE EFFECTIVE DATES:** 08/02/2010 - Present

### C. OUTLINE OF MAJOR CONTENT AREAS

1. Acids/Bases
2. Alkanes & Cycloalkanes
3. Alkenes & Alkyes
4. Bonding & Molecular Structure
5. Carbon Compounds & IR
6. NMR
7. Stereochemistry

### D. LEARNING OUTCOMES (General)

1. predict the products of reactions of alkenes and to write the mechanisms showing how the products are formed.
2. draw and interpret reaction coordinate diagrams, and be able to relate the energetic changes associated with chemical reactions to equilibrium constants and rate; be able to differentiate kinetic versus thermodynamic control of reactions.
3. identify the types of isomerism in organic compounds, to identify and classify chiral centers, and explain the physical and chemical consequences of chirality.
4. describe atomic and molecular structure and bonding, and properly represent organic molecules.
5. classify organic compounds by structure, use the IUPAC nomenclature, and identify conformational effects in organic compounds.
6. correctly represent the structures and bonding of alkynes, and be able to write the mechanisms for reactions of alkynes and predict the products of such reactions.
7. analyze and identify important structural features utilizing Infrared spectroscopy and <sup>1</sup>H-NMR spectroscopy.
8. identify compounds in which resonance is important, to predict the effect of resonance on the stability of compounds and reactive intermediates, and be able to draw resonance structures.
9. write mechanisms for substitution and elimination reactions, and to predict the effect of nucleophile, leaving group, and solvent on the relative rates of SN1 versus SN2 reactions, and E1 versus E2 reactions, as well as on the relative rates of substitution versus elimination.

**E. Minnesota Transfer Curriculum Goal Area(s) and Competencies**

None

**F. LEARNER OUTCOMES ASSESSMENT**

As noted on course syllabus

**G. SPECIAL INFORMATION**

None noted