

## Department:

Chemistry

## Course Description:

This course is the second in a two-semester sequence. The course will continue to focus on topics presented in PS 210 and how they apply to chemical synthesis and structure determination. The topics will be applied to aldehydes and ketones, carboxylic acids and their derivatives, amines, aromaticity, benzene and its derivatives, organometallic compounds, conjugated and unconjugated unsaturated systems, and pericyclic reactions. Selected applications to biochemistry, medicinal and pharmaceutical chemistry, and industrial chemistry will also be discussed.

## Course Competencies:

Upon completion of the course, the student should be able to:

1. Perform functional group analysis and explain properties in principle and in lab applications.
2. Apply the principles of relevant nomenclature, including chiral- and stereo- designations.
3. Explain organic reactions and reaction mechanisms.
4. Describe basic approaches to chemical synthesis.
5. Conduct lab work consisting of functional group analysis, spectroscopic analysis, and identification of unknowns.

## Course Content:

- A. Conjugation, resonance, dienes
- B. Benzene and aromatic compounds
- C. Electrophilic aromatic substitutions
- D. Carboxylic acids and the acidity of the O-H bond
- E. Introduction to carbonyl chemistry; organometallic reagents; oxidation and reduction
- F. Aldehydes and ketones; nucleophilic addition
- G. Carboxylic acids and their derivatives; nucleophilic substitution
- H. Substitution reactions of carbonyl compounds at the  $\alpha$  carbon
- I. Carbonyl condensation reactions
- J. Amines
- K. Carbon-carbon bond-forming reactions in organic synthesis
- L. Carbohydrates
- M. Amino acids and proteins
- N. Lipids
- O. Synthetic polymers

### Learning Assessments:

Course competencies will be assessed by use of homework assignments, lab work experiments, quizzes, regular exams, and a final exam.

### Instructional Materials:

Organic Chemistry, by Joel M Karty, published 2014 by W W Norton & Company Inc.,  
9780393919042

#### **Guidelines for Requesting Accommodations Based on Documented Disability or Medical Condition**

It is the intention of Highland Community College to work toward full compliance with the Americans with Disabilities Act, to make instructional programs accessible to all people, and to provide reasonable accommodations according to the law.

Students should understand that it is their responsibility to self-identify their need(s) for accommodation and that they must provide current, comprehensive diagnosis of a specific disability or medical condition from a qualified professional in order to receive services. Documentation must include specific recommendations for accommodation(s). Documentation should be provided in a timely manner prior to or early in the semester so that the requested accommodation can be considered and, if warranted, arranged.

In order to begin the process all students **must** complete the "Disabilities Self-Identification Form" at this link:  
<https://highlandcc.edu/pages/disability-services>.

This form can also be accessed at the Highland Community College homepage under Students Services/Student Resources/Disability Service or by contacting the Disabilities Coordinator.