COURSE OUTLINE
Revision: Stephanie Endsley  Date: May, 2008

DEPARTMENT: Academic Programs
CURRICULUM: The Natural World
COURSE TITLE: Organic Chemistry II
COURSE NUMBER: CHEM& 242
TYPE OF COURSE: Academic Transfer
COURSE LENGTH: 1 quarter
CREDIT HOURS: 4
LECTURE HOURS: 44
LAB HOURS: 0
CLASS SIZE: 27
PREREQUISITES: CHEM& 241 with a 2.0 or better

COURSE DESCRIPTION: The second of a three-course series in organic chemistry. Topics include a further discussion of the physical properties and transformations of organic molecules, especially aromatic and carbonyl compounds. This sequence satisfies the organic chemistry requirements for science majors and for various pre-professional programs such as pre-medical, pre-dental, and other pre-technical disciplines.

STUDENT LEARNING OUTCOMES ADDRESSED:

1. Communication – Students will develop the ability to pronounce and spell the different types of organic molecules and use the correct chemical terminology.
2. Human Relations - Students will use social interactive skills to collaborate with classmates on in-class activities and problem solving sessions.
3. Technology – Use appropriate chemical terminology and nomenclature to describe organic compounds. Attach meaning to abstract symbols and know when to use, which symbol and formulate patterns based on specific examples.
4. Critical Thinking and Problem Solving Skills – Apply vocabulary, concepts and techniques to understand and solve problems pertaining to chemical theories and introductory organic chemistry. Develop skills to determine if conclusions or solutions are reasonable.

GENERAL COURSE OBJECTIVES:

At the end of the course the student will:

1. Illustrate basic concepts relating to reactivity of organic compounds, including: substitution, addition, elimination, oxidation-reduction, and free radical reactions, and the mechanisms for these reactions.

2. Formulate a reasonable multi-step synthesis of an organic compound from a specified starting material.

3. Be able to assign the various spectral attributes and features of an organic compound related to spectroscopic data including: infrared, nuclear magnetic resonance, mass spectrometry, and ultraviolet/visible in order to elucidate the correct structure of a molecule.

TOPICAL OUTLINE: APPROX. HOURS: 44 hours

The three quarter sequence in organic chemistry will address the topics below. The emphasis and order of presentation will vary according to instructor and text by quarter.

I. Structure and bonding
II. Acids and Bases
   Bronsted definition
   Lewis definition
   Resonance
III. Hydrocarbons – alkanes and cycloalkanes
    Nomenclature and physical properties
    Conformational analysis
IV. Hydrocarbons – Alkenes and alkynes
    Nomenclature and physical properties
    Synthesis
    Reactions
V. Stereochemistry and chirality
VI. Alkyl halides
    Nucleophilic substitution reactions
    Elimination reactions
VII. Spectroscopy – Ultraviolet/Visible, Infrared, Nuclear magnetic resonance, and Mass Spectrometry
VIII. Conjugated systems and aromatics
   Nomenclature and physical properties
   Aromaticity
   Synthesis
   Cycloaddition
   Electrophilic aromatic substitution
IX. Alcohols and phenols
   Nomenclature and physical properties
   Synthesis
   Reactions
X. Ethers, epoxides, thiols and sulfides
   Nomenclature and physical properties
   Synthesis
   Reactions
XI. Aldehydes and ketones
   Nomenclature and physical properties
   Synthesis
   Nucleophilic addition reactions
   Aldol and Claisen condensation reactions
XII. Carboxylic acids and derivatives
    Nomenclature and physical properties
    Synthesis
    Reactions
XIII. Amines and heterocycles
      Nomenclature and physical properties
      Synthesis
      Reactions
XIV. Biochemical topics
     Carbohydrates, lipids, proteins, and nucleic acids
<table>
<thead>
<tr>
<th>SLO #</th>
<th>Included in Course Objective Number</th>
<th>SCC Student Learning Outcomes</th>
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</thead>
<tbody>
<tr>
<td>SLO 1.1</td>
<td></td>
<td>Communication - Read and listen actively</td>
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<tr>
<td>SLO 1.2</td>
<td>1,2</td>
<td>Communication - Speak and write effectively</td>
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<tr>
<td>SLO 2.1</td>
<td></td>
<td>Computation - Use mathematical operations</td>
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<tr>
<td>SLO 2.2</td>
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<td>Computation - Apply quantitative skills</td>
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<tr>
<td>SLO 2.3</td>
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<td>Computation - Identify, interpret, and utilize higher level mathematical and cognitive skills</td>
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<tr>
<td>SLO 3.1</td>
<td>1,2</td>
<td>Human Relations - Use social interactive skills to work in groups effectively</td>
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<tr>
<td>SLO 3.2</td>
<td>1,2</td>
<td>Human Relations - Recognize the diversity of cultural influences and values</td>
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<tr>
<td>SLO 4.1</td>
<td>1,2,3</td>
<td>Critical Thinking and Problem Solving</td>
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<td>SLO 5.1</td>
<td>3</td>
<td>Technology - Select and use appropriate technological tools</td>
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<td>SLO 6.1</td>
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<td>Personal Responsibility - Be motivated and able to continue learning and adapt to change</td>
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<td>SLO 6.2</td>
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<td>Personal Responsibility - Value one's own skills, abilities, ideas and art</td>
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<td>SLO 6.3</td>
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<td>Personal Responsibility - Take pride in one's work</td>
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<td>SLO 6.4</td>
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<td>Personal Responsibility - Manage personal health and safety</td>
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<td>SLO 6.5</td>
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<td>Personal Responsibility - Be aware of civic and environmental issues</td>
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<tr>
<td>SLO 7.1</td>
<td>1,2</td>
<td>Information Literacy - Access and evaluate information</td>
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<tr>
<td>SLO 7.2</td>
<td></td>
<td>Information Literacy - Use information to achieve personal, academic, and career goals, as well as to participate in a democratic society</td>
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