COURSE OUTLINE
Revision: Stephanie Endsley Date: May, 2008

DEPARTMENT: Academic Programs
CURRICULUM: The Natural World
COURSE TITLE: Organic Chemistry III
COURSE NUMBER: CHEM& 243
TYPE OF COURSE: Academic Transfer
COURSE LENGTH: 1 quarter
CREDIT HOURS: 4
LECTURE HOURS: 44
LAB HOURS: 0
CLASS SIZE: 27
PREREQUISITES: CHEM& 242 with a 2.0 or better

COURSE DESCRIPTION: The third of a three-course series in organic chemistry. Topics include polyfunctional compounds, natural products, lipids, carbohydrates, amino acids, proteins and nucleic acids. 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 the basic concepts relating to the reactivity of carbonyl compounds and the mechanisms for these reactions.
2. Design a multistep synthesis of an organic compound from a specified starting material.
3. Identify and explain the relevance and structure and the four main classes of macromolecules (carbohydrates, lipids, proteins, and nucleic acids).

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
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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

REVISED BY: Stephanie Endsley  
DATE: May, 2008
<table>
<thead>
<tr>
<th>SLO #</th>
<th>Included in Course Objective Number</th>
<th>SSCC Student Learning Outcomes</th>
</tr>
</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>1,3</td>
<td>Communication - Speak and write effectively</td>
</tr>
<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>
<td></td>
<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></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>2</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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<tr>
<td>SLO 6.2</td>
<td></td>
<td>Personal Responsibility - Value one's own skills, abilities, ideas and art</td>
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<tr>
<td>SLO 6.3</td>
<td></td>
<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>2,3</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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