DEPARTMENT: Academic Programs
CURRICULUM: The Natural World
COURSE TITLE: Organic Chemistry I
COURSE NUMBER: CHEM& 241
TYPE OF COURSE: Academic Transfer
COURSE LENGTH: 1 quarter
CREDIT HOURS: 4
LECTURE HOURS: 44
LAB HOURS: 0
CLASS SIZE: 27
PREREQUISITES: CHEM& 163 with a 2.0 or better

COURSE DESCRIPTION: The first of a three-course series in organic chemistry. Topics include structure, nomenclature, stereochemistry, reactions and synthesis of the main types of organic compounds. This sequence satisfies the organic chemistry requirements for science majors and for various pre-professional programs such as premedical, 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.
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Date: May, 2008

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. Identify the various functional groups present in an organic molecule.

2. Give the correct IUPAC name of an organic compound when provided the structure of the compound, and give the correct structure of a compound when provided the IUPAC name.

3. Illustrate basic concepts of structure and bonding in organic compounds, including: constitutional isomerism, stereoisomerism, conformational analysis, and structural effects on the physical and chemical properties of organic compounds.

4. Explain the chemical behavior and reactivity of organic compounds related to thermodynamics, kinetics, and acid-base behavior.

5. Predict the product(s) of an organic reaction(s) consisting of one or several steps, taking into account the correct stereochemistry, regiochemistry, and chemoselectivity of the product(s).

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

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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>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>3,4</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>3,4,5</td>
<td>Human Relations - Use social interactive skills to work in groups effectively</td>
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<tr>
<td>SLO 3.2</td>
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<td>Human Relations - Recognize the diversity of cultural influences and values</td>
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<tr>
<td>SLO 4.1</td>
<td>3,4,5</td>
<td>Critical Thinking and Problem Solving -</td>
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<tr>
<td>SLO 5.1</td>
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<td>Technology - Select and use appropriate technological tools</td>
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<tr>
<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>
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<td>Personal Responsibility - Value one's own skills, abilities, ideas and art</td>
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<tr>
<td>SLO 6.3</td>
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<td>Personal Responsibility - Take pride in one's work</td>
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<tr>
<td>SLO 6.4</td>
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<td>Personal Responsibility - Manage personal health and safety</td>
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<tr>
<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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PREPARED BY: Stephanie Endsley
DATE: May, 2008