CHEM C225: ORGANIC CHEMISTRY B

Item	Value
Curriculum Committee Approval Date	12/12/2008
Top Code	190500 - Chemistry, General
Units	3 Total Units
Hours	54 Total Hours (Lecture Hours 54)
Total Outside of Class Hours	0
Course Credit Status	Credit: Degree Applicable (D)
Material Fee	No
Basic Skills	Not Basic Skills (N)
Repeatable	No
Grading Policy	Standard Letter (S)
Local General Education (GE)	• CL Option 1 Natural Sciences (CB1)
California General Education Transfer Curriculum (Cal-GETC)	• Cal-GETC 5A Physical Science (5A)
Intersegmental General Education Transfer Curriculum (IGETC)	• IGETC 5A Physical Science (5A)
California State University General Education Breadth (CSU GE-Breadth)	• CSU B1 Physical Science (B1)

Course Description

Further study of the structures, reactions, and reaction mechanisms of organic compounds, with particular emphasis on conjugated molecules, aromatic systems, and carbonyl containing compounds and an introduction to biologically important molecules such as amino acids, carbohydrates, and lipids. PREREQUISITE: CHEM C220. COREQUISITE: CHEM C225L. Transfer Credit: CSU; UC. C-ID: CHEM 160 S.**C-ID:** CHEM 160 S.

Course Level Student Learning Outcome(s)

1. Interpret spectroscopic data pertaining to reactions involving dienes, aromatic molecules, and carbonyl containing systems
2. Use IUPAC nomenclature rules to provide systematic names for a chemical structure or sketch the appropriate chemical structure from a systematic name for conjugated alkenes, aromatic molecules, aldehydes and ketones, carboxylic acids, esters, and amides
3. Predict the expected products, including stereoisomers and regioisomers, and provide the relevant reagents for common organic reactions including dienes, aromatic compounds, aldehydes, ketones, carboxylic acids, esters, and amides.
4. Propose reasonable reaction mechanisms for chemical reactions and explain the anticipated stereochemistry for reactions, including dienes, aromatic compounds, aldehydes, ketones, carboxylic acids, esters, and amides.

Course Objectives

- 1. Formulate IUPAC names for aromatic and carbonyl containing compounds
- 2. Design multi-step synthetic pathways to dienes, aromatic compounds, and carbonyl containing compounds
- 3. Predict the products of and provide the reagents needed for reactions involving dienes, aromatic compounds, and carbonyl containing compounds.

Lecture Content

Conjugated Dienes UV spectroscopy Diels – Alder reaction, Cope rearrangement, pericyclic reactions Aromaticity Defining aromatic; stability of aromatic systems Electrophilic Aromatic Substitution Reactions of aromatic systems Reactions and properties of diazo-substituted aromatics Carbonyl chemistry Nomenclature Reactions of aldehydes and ketones Synthesis routes to aldehydes and ketones Carboxylic acids and derivatives Nomenclature Reactions Synthesis and interconversions Carbonyl Condensation Reactions Alpha Substitution Aldol and Claisen condensations Michael addition, Robinson annulation and Stork reaction Amines Nomenclature Gabriel Synthesis, Hoffman elimination Uses in pharmacology Biological Molecules Lipids: Steroids, Fatty Acids, Triglyceride Esters, Eicosanoids Carbohydrates Reactions of Carbohydrates

Method(s) of Instruction

- Lecture (02)

Instructional Techniques

Lecture, Demonstration, problem-solving assignments and discussions

Reading Assignments

Reading Textbook selections prior to lecture

Writing Assignments

Research report on an organic chemistry application topic

Out-of-class Assignments

homework assignments including problem-solving

Demonstration of Critical Thinking

Tests and problem-solving exercises

Required Writing, Problem Solving, Skills Demonstration

Explanations of reaction mechanisms Research on organic chemistry application

Eligible Disciplines

Chemistry: Masters degree in chemistry OR bachelors degree in chemistry or biochemistry AND masters degree in biochemistry, chemical engineering, chemical physics, physics, molecular biology, or geochemistry OR the equivalent. Masters degree required.

Textbooks Resources

1. Required Wade, Leory G. Organic Chemistry, 9th ed. Pearson, 2017 Rationale: -

Other Resources

1. Coastline Library