CHEM A220: ORGANIC CHEMISTRY A

Item	Value
Curriculum Committee Approval Date	02/09/2022
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)
Associate Arts Local General Education (GE)	• OC Physical/Biological Sci - AA (OB)
Associate Science Local General Education (GE)	• OCC Physical/Biological Sci-AS (OSB)
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

A study of organic compounds and their reactions from the standpoint of structure, mechanisms and kinetics. Introduction to spectroscopic methods of identification. PREREQUISITE: CHEM A185. Transfer Credit: CSU; UC. C-ID: CHEM 150 when CHEM A220L is also completed.**C-ID:** CHEM 150 when CHEM A220L is also completed.

Course Level Student Learning Outcome(s)

1. Apply the principles of electron configurations, Lewis structural theory, VSEPR theory, molecular orbital theory, and valence bond theory to predict the structure, bonding, and three-dimensional shape of simple inorganic and organic species from the chemical formula.
2. Use IUPAC nomenclature rules to provide a systematic name for a chemical structure or a chemical structure from a systematic name for alkanes, alkyl halides, alkenes, alkynes, alcohols, and ethers.
3. Predict the products, including stereoisomers and regioisomers, and provide the appropriate reagents for common reactions including nucleophilic substitution, elimination, and for reactions of alkenes, alkynes, alcohols, ethers, epoxides, and dienes.
4. Generate a reaction mechanism that explains the regiochemistry and stereochemistry for reactions including nucleophilic substitution, elimination, alkene additions, alkyne additions, and free radical halogenations.

Course Objectives

- 1. Describe the meaning and usage of important terms in organic chemistry
- 2. Solve organic chemistry problems using the knowledge and theories of organic chemistry in an organized and logical manner
- 3. Use the IUPAC and common nomenclature systems to recognize and name organic compounds covered in the course
- 4. Explain the relation between molecular structure and the physical properties of organic compounds, and use these relationships to predict the physical properties of organic compounds
- 5. Explain the relationship between molecular structure and molecular reactivity in organic compounds
- 6. Predict the products of the important reactions of the covered organic compounds
- 7. Use the mechanisms of the covered reactions to explain and predict the site-selectivity and stereochemistry of the important reactions of organic chemistry
- 8. Use the reactions of the covered organic compounds to plan short, multi-step syntheses of organic compounds

Lecture Content

Introduction to Organic Chemistry Functional Groups of Organic Compounds Structure, Properties and Syntheses of Alkanes and Cycloalkanes Reactions of Alkanes and Cycloalkanes Structure and Synthesis of Alkenes Reactions and Alkenes Stereochemistry Alkynes Conjugated Unsaturated Systems The Phenomenon of Aromaticity Reactions of Aromatic Compounds Organic Halides and Organometallic Compounds Spectroscopy of Organic Compounds

Method(s) of Instruction

- Lecture (02)
- DE Live Online Lecture (02S)
- DE Online Lecture (02X)

Instructional Techniques

Lecture, demonstration, problem assignments, and discussion.

Reading Assignments

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Writing Assignments

Assignments and exams will include some questions requiring the writing of sentence explanations and/or descriptions. Students will be expected to analyze questions and generate answers to them. Some questions will require the use of principles to synthesize an answer which was not taught.

Out-of-class Assignments

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Demonstration of Critical Thinking

Exams, quizzes, homework. Examinations will include problem solving exercises.

Required Writing, Problem Solving, Skills Demonstration

Assignments and exams will include some questions requiring the writing of sentence explanations and/or descriptions. Students will be expected to analyze questions and generate answers to them. Some questions will require the use of principles to synthesize an answer which was not taught.

Textbooks Resources

1. Required Wade, Leroy G., Jr. Organic Chemistry. , 6TH ed. Upper Saddle River: Pearson Prentice Hall, 2006 Rationale: -