CHEM 8 Course Outline as of Fall 2013

CATALOG INFORMATION

Dept and Nbr: CHEM 8 Title: INTRO ORGANIC CHEMISTRY
Full Title: Introductory Organic Chemistry
Last Reviewed: 11/26/2018

Units		Course Hours per Week		Nbr of Weeks	Course Hours Total	
Maximum	5.00	Lecture Scheduled	4.00	17.5	Lecture Scheduled	70.00
Minimum	5.00	Lab Scheduled	3.00	17.5	Lab Scheduled	52.50
		Contact DHR	0		Contact DHR	0
		Contact Total	7.00		Contact Total	122.50
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 140.00 Total Student Learning Hours: 262.50

Title 5 Category:	AA Degree Applicable
Grading:	Grade Only
Repeatability:	00 - Two Repeats if Grade was D, F, NC, or NP
Also Listed As:	
Formerly:	

Catalog Description:
An introduction to the principles, nomenclature, structure and reaction mechanisms of organic chemistry.

Prerequisites/Corequisites:
Course Completion of CHEM 1A and Course Completion of ENGL 1A OR Course Completion of CHEM 42 and Course Completion of ENGL 1A

Recommended Preparation:

Limits on Enrollment:

Schedule of Classes Information:
Description: An introduction to the principles, nomenclature, structure and reaction mechanisms of organic chemistry. (Grade Only)
Prerequisites/Corequisites: Course Completion of CHEM 1A and Course Completion of ENGL 1A OR Course Completion of CHEM 42 and Course Completion of ENGL 1A
Recommended:
Limits on Enrollment:

Transfer Credit: CSU;UC.
Repeatability: Two Repeats if Grade was D, F, NC, or NP

ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:

AS Degree:	**Area**		Effective:	Inactive:
CSU GE:	**Transfer Area**		Effective:	Inactive:
	B1	Physical Science	Fall 1981	
	B3	Laboratory Activity		
IGETC:	**Transfer Area**		Effective:	Inactive:
	5A	Physical Sciences	Fall 1981	
	5C	Fulfills Lab Requirement		

CSU Transfer:	Transferable	Effective:	Fall 1981	Inactive:
UC Transfer:	Transferable	Effective:	Fall 1981	Inactive:

CID:

Certificate/Major Applicable:
Major Applicable Course

COURSE CONTENT

Outcomes and Objectives:
Upon successful completion of this course the student will be able to:
1. Predict and explain three-dimensional structure and conformational changes for organic compounds.
2. Apply rules of nomenclature for naming organic compounds.
3. Deduce the structures for products of organic reactions.
4. Predict and explain relative physical properties of organic compounds.
5. Predict and explain relative reactivities of organic compounds.
6. Suggest appropriate methods for the syntheses of organic compounds.
7. Propose mechanisms for organic reactions.
8. Compare and contrast structures and properties of biological compounds.
9. Apply selected organic and biological chemistry concepts and theories to contemporary issues such as health, nutrition, or the environment.
10. Make observations and apply chemical concepts in the laboratory.
11. Analyze compounds by instrumental methods.

Topics and Scope:

I. Bonding and Structure of Organic Compounds
 A. Lewis Structures
 B. Valence Shell Electron Pair Repulsion (VSEPR) Theory
 C. Resonance and Formal Charge
 D. Hybridization
 E. Functional Groups
 F. Curved Arrow Formalism
II. Acid-Base Chemistry
 A. Definitions of Acids and Bases

B. Acidity and pKa
III. Alkanes and Cycloalkanes
A. Physical Properties
B. Nomenclature
C. Constitutional Isomers
D. Conformations and Newman Projections
IV. Alkenes and Alkynes
A. Nomenclature
B. Geometric (cis-trans) Isomerism
C. Electrophilic Addition
D. Mechanism of Electrophilic Additions
E. Hydrogenation
V. Stereochemistry
A. Enantiomers and Diastereomers
B. Properties of Chiral and Achiral Compounds
C. Meso Compounds and Racemates
VI. Aromatic Compounds
VII. Alcohols, Ethers and Sulfur Compounds
A. Structure
B. Elimination Reactions of Alcohols
C. Oxidation Reactions
VIII. Substitution and Elimination Reactions
A. SN1 and SN2 Reactions
B. E1 and E2 Reactions
C. Factors Influencing the Occurrence of Each Mechanism
IX. Aldehydes and Ketones
A. Structure
B. Nucleophilic Addition
C. Multistep Syntheses
X. Carboxylic Acids and Derivatives
A. Structure and Physical Properties
B. Acid-Base Properties
C. Nucleophilic Substitution
XI. Amines
A. Structure
B. Acid-Base Properties
C. Reactions
XII. Carbohydrates
A. Monosaccharides
B. Stereochemistry and Mutarotation
C. Disaccharides
D. Polysaccharides
XIII. Amino Acids and Proteins
A. Structure and Classification
B. Levels of Organization
C. Biochemical Significance
XIV. Nucleic Acids

Assignment:

Assignments may include:
1. Specific reading and study assignments, 30-45 pages per week.

2. Homework exercises, 15-20 problems per week.
3. Written laboratory reports 10-15, including a discussion of each experiment.
4. Lecture and laboratory exams, 3-6.
5. Comprehensive final exam.
6. Lab Skill Demonstration.

Methods of Evaluation/Basis of Grade:

Writing: Assessment tools that demonstrate writing skills and/or require students to select, organize and explain ideas in writing.

Lab Reports	Writing 20 - 35%

Problem Solving: Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.

Homework	Problem solving 0 - 10%

Skill Demonstrations: All skill-based and physical demonstrations used for assessment purposes including skill performance exams.

Lab Skills	Skill Demonstrations 0 - 2%

Exams: All forms of formal testing, other than skill performance exams.

Lecture and lab exams, final exam	Exams 65 - 75%

Other: Includes any assessment tools that do not logically fit into the above categories.

None	Other Category 0 - 0%

Representative Textbooks and Materials:
Introduction to Organic Chemistry, 4th Ed., Brown and Poon, Wiley, 2011.
The Organic Chem Lab Survival Manual: A Student's Guide to Techniques, 8th Ed., Zubrick, Wiley, 2011.
Essential Organic Chemistry, Bruice, Prentice Hall, 2009
Fundamentals of Organic Chemistry, 7th ed., McMurry, Brooks/Cole, 2010
Organic Chemistry, Hill and Barbaro, Contempory Publishing Company of Raleigh, 2004 (classic)
Techniques for the Organic Laboratory: Microscale and Macroscale, Pavia, Lampman, Kriz, and Engel, Brooks/Cole, 2006 (classic)