CHEM 12A Course Outline as of Fall 2009

CATALOG INFORMATION

Dept and Nbr: CHEM 12A Title: ORGANIC CHEMISTRY
Full Title: Organic Chemistry
Last Reviewed: 2/10/2020

Units		Course Hours per Week		Nbr of Weeks	Course Hours Total	
Maximum	5.00	Lecture Scheduled	3.00	17.5	Lecture Scheduled	52.50
Minimum	5.00	Lab Scheduled	6.00	17.5	Lab Scheduled	105.00
		Contact DHR	0		Contact DHR	0
		Contact Total	9.00		Contact Total	157.50
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 105.00 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:
For students majoring in chemistry, biochemistry, chemical engineering, or a closely related field such as molecular and cell biology. The first semester of an intensive one-year program based upon modern theoretical concepts of organic chemistry. All aspects of fundamental organic chemistry are studied, including nomenclature, chemical and physical properties, reactions and synthesis. The study includes theoretical aspects, reaction mechanisms, and multistep synthesis. Students transferring to a four-year college or university are expected to complete this sequence prior to their junior year.

Prerequisites/Corequisites:
Course Completion of CHEM 1B or CHEM 4B.

Recommended Preparation:

Limits on Enrollment:

Schedule of Classes Information:
Description: For students majoring in chemistry, biochemistry, chemical engineering, or a closely related field such as molecular and cell biology. The first semester of an intensive one-

year program based upon modern theoretical concepts of organic chemistry. All aspects of fundamental organic chemistry are studied, including nomenclature, chemical and physical properties, reactions and synthesis. The study includes theoretical aspects, reaction mechanisms, and multistep synthesis. Students transferring to a four-year college or university are expected to complete this sequence prior to their junior year. (Grade Only)
Prerequisites/Corequisites: Course Completion of CHEM 1B or CHEM 4B.
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	Spring 2000	
	B3	Laboratory Activity		
IGETC:	**Transfer Area**		Effective:	Inactive:
	5A	Physical Sciences	Spring 2007	
	5C	Fulfills Lab Requirement		

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

CID:

CID Descriptor:CHEM 150	Organic Chemistry for Science Majors I, with Lab
SRJC Equivalent Course(s):	CHEM12A
CID Descriptor:CHEM 160S	Organic Chemistry for Science Majors Sequence A
SRJC Equivalent Course(s):	CHEM12A AND CHEM12B

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 structures, including conformational changes, for organic compounds.
2. Name organic compounds.
3. Predict 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. Predict and explain mechanisms for organic reactions.
8. Make observations and apply chemical concepts in the laboratory.
9. Use common laboratory techniques to synthesize, isolate, purify, and identify organic compunds.
10. Analyze compounds by instrumental methods.

Topics and Scope:

LECTURE MATERIAL
1. Bonding and structure of organic compounds
2. Alkanes and Cycloalkanes
3. Stereochemistry
4. Alkenes and Alkynes
5. Nucleophilic Substitution and Elimination Reactions
6. Dienes
7. Aromaticity and Aromatic Compounds
8. Spectroscopy

LABORATORY MATERIAL
1. Crystalization
2. Melting Point Determination
3. Spectroscopy
4. Distillations
5. Chromatography
6. Extraction
7. Nuclear Magnetic Resonance Spectroscopy
8. Infrared Spectroscopy
9. Isolation of Organic Compounds
10. Synthesis of Organic Compounds
11. Structure Determination
12. Instrumental Methods

Assignment:

1. Specific reading and study assignments averaging 40-50 pages per week.
2. Completion of end-of-chapter exercises averaging 20-25 problems per week.
3. Laboratory experiments: identification of unknowns and products of reactions by physical, instrumental, and spectroscopic methods.
4. A written laboratory report on each experiment detailing accomplishments.
5. Four to six lecture and laboratory exams plus a comprehensive final exam.

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 10 - 25%

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

Lab reports	Problem solving 5 - 10%

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

Lab skill technique/accurate lab results	Skill Demonstrations 1 - 5%

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

Multiple choice, Completion, Problem solving and short essay	Exams 60 - 80%

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

None	Other Category 0 - 0%

Representative Textbooks and Materials:
Organic Chemistry, 7th ed., Francis Carey, McGraw Hill, 2008
Organic Chemistry, 3rd ed., Maitland Jones, Jr., W.W. Norton & Co, 2004
Introduction to Organic Laboratory Techniques: A Microscale Approach, 4th ed., Pavia, Lampman, Kriz, and Engel, Brooks/Cole, 2007
Experimental Organic Chemistry, Daniel Palleros, Wiley, 2000