

**CHEM 60 Course Outline as of Fall 2017****CATALOG INFORMATION**

Dept and Nbr: CHEM 60      Title: GEN ORG BIOL CHEM  
 Full Title: General, Organic and Biological Chemistry  
 Last Reviewed: 5/9/2022

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	6	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 or P/NP

Repeatability: 00 - Two Repeats if Grade was D, F, NC, or NP

Also Listed As:

Formerly:

**Catalog Description:**

Basic concepts of general, organic and biological chemistry. Satisfies the requirements of nursing and related majors that require one semester of chemistry.

**Prerequisites/Corequisites:****Recommended Preparation:**

Eligibility for MATH 150B or equivalent AND eligibility for ENGL 100 or ESL 100

**Limits on Enrollment:****Schedule of Classes Information:**

Description: Basic concepts of general, organic and biological chemistry. Satisfies the requirements of nursing and related majors that require one semester of chemistry. (Grade or P/NP)

Prerequisites/Corequisites:

Recommended: Eligibility for MATH 150B or equivalent AND eligibility for ENGL 100 or ESL 100

Limits on Enrollment:

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

## **ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:**

<b>AS Degree:</b>	<b>Area</b>		Effective:	Inactive:
	C	Natural Sciences	Fall 1981	
<b>CSU GE:</b>	<b>Transfer Area</b>		Effective:	Inactive:
	B1	Physical Science	Fall 2016	
	B3	Laboratory Activity		
<b>IGETC:</b>	<b>Transfer Area</b>		Effective:	Inactive:
<b>CSU Transfer:</b>	Transferable	Effective:	Fall 1981	Inactive:
<b>UC Transfer:</b>		Effective:		Inactive:

### **CID:**

### **Certificate/Major Applicable:**

Major Applicable Course

## **COURSE CONTENT**

### **Student Learning Outcomes:**

At the conclusion of this course, the student should be able to:

1. Recognize and apply the underlying chemical foundations of medicine and life.
2. Correlate microscopic and macroscopic behavior of matter.
3. Solve quantitative problems relating to chemical principles.
4. Safely use basic equipment to observe and measure chemical and physical properties in the laboratory.

### **Objectives:**

Upon completion of this course, the student will be able to:

1. Recognize the structures and functional groups of lipids, carbohydrates, proteins and nucleic acids.
2. Demonstrate a basic understanding of organic reactions.
3. Recognize the importance of chemistry in health care and society.
4. Explain bulk properties of gases from a molecular scale perspective.
5. Relate intermolecular forces to physical properties of substances.
6. Draw Lewis structures, and relate them to isomerism and molecular geometry.
7. Calculate quantities related to concentrations of solutions.
8. Use moles and mole ratios to calculate quantities in reactions.
9. Assemble and handle appropriate lab equipment effectively and safely.
10. Develop skills of observation, record keeping, and lab notebook maintenance.
11. Interpret observations using chemical principles.

### **Topics and Scope:**

- I. Atomic Theory
  - A. Structure of the atom
  - B. Organization of the periodic table

- C. Ions
- D. Mole concept
- II. Laboratory Measurements and Calculations
- III. Chemical Bonding and Molecular Structure
  - A. Ionic compounds
  - B. Covalent compounds
  - C. Organic structures and functional groups
  - D. Isomerism and stereochemistry
- IV. Chemical Reactions
  - A. Balancing reactions
  - B. Basic organic reactions
  - C. Simple acid-base reactions
  - D. Le Chatelier's principle
  - E. Reaction mechanisms and associated energy changes
- V. Matter at the Sub Microscopic Level
  - A. Gases, liquids and solids
  - B. Qualitative atomic theory of gases
  - C. Intermolecular forces
- VI. Solutions
  - A. Measures of concentration
  - B. Diffusion, osmosis and dialysis
  - C. pH and buffers
- VII. Biological Molecules
  - A. Lipids
  - B. Carbohydrates
  - C. Amino acids and peptides
  - D. Proteins
  - E. Nucleic acids
- VIII. Metabolism

Lab material will be chosen each semester to supplement or reinforce most of the topics above.

Sample Labs:

1. Measurements, Metric System and Conversions
2. Lewis Structures and Molecular Geometry
3. Reactions and Observations
4. Gases
5. Stoichiometry
6. Diffusion, Osmosis and Dialysis
7. Solutions
8. Lipids
9. Acids, Bases and Buffers
10. Carbohydrates
11. Amino Acids
12. Enzymes
13. Lab Skill Evaluation

**Assignment:**

1. Reading and study (1-2 chapters per week)
2. Homework assignments (0-16)
3. Laboratory reports (11-16)

4. Semester exams (3-5) and final exam
5. Quizzes (0-8)

### 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 assignments, quizzes

Problem solving  
0 - 15%

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

None

Skill Demonstrations  
0 - 0%

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

Multiple choice, completion, short essay, midterm and final exam

Exams  
60 - 75%

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

Class and laboratory participation

Other Category  
0 - 5%

### Representative Textbooks and Materials:

General, Organic and Biological Chemistry. 2nd Ed. Frost, Laura and Deal, Todd. Pearson. 2014  
 Chemistry: An Introduction to General, Organic, and Biological Chemistry. 13th Ed. Timberlake, Karen. Pearson. 2017  
 General Organic and Biological Chemistry: An Integrated Approach. 4th Ed. Raymond, Kenneth. Wiley. 2014  
 General, Organic and Biochemistry. 9th Ed. Denniston, Katherine and Topping, Joseph and Dorr, Danae Quirk. McGraw Hill. 2016

Laboratory Materials:

Instructor prepared materials

Chemistry 60 Laboratory Manual. Ormcen, Tatjana. Arbor Crest. 2014