## CATALOG INFORMATION

**Dept and Nbr:** CHEM 60  
**Title:** GEN ORG BIOL CHEM  
**Full Title:** General, Organic and Biological Chemistry  
**Last Reviewed:** 11/28/2016

### 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)

---

### Course Outline as of Fall 2017

<table>
<thead>
<tr>
<th>Units</th>
<th>Course Hours per Week</th>
<th>Nbr of Weeks</th>
<th>Course Hours Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum 5.00</td>
<td>Lecture Scheduled 4.00</td>
<td>17.5</td>
<td>Lecture Scheduled 70.00</td>
</tr>
<tr>
<td>Minimum 5.00</td>
<td>Lab Scheduled 3.00</td>
<td>6</td>
<td>Lab Scheduled 52.50</td>
</tr>
<tr>
<td></td>
<td>Contact DHR 0</td>
<td></td>
<td>Contact DHR 0</td>
</tr>
<tr>
<td></td>
<td>Contact Total 7.00</td>
<td></td>
<td>Contact Total 122.50</td>
</tr>
<tr>
<td></td>
<td>Non-contact DHR 0</td>
<td></td>
<td>Non-contact DHR 0</td>
</tr>
</tbody>
</table>

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.
ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:

AS Degree:  Area  Effective:  Inactive:
             C  Natural Sciences  Fall 1981
CSU GE:    Transfer Area  Effective:  Inactive:
           B1  Physical Science  Fall 1981
           B3  Laboratory Activity

IGETC:     Transfer Area  Effective:  Inactive:

CSU Transfer: Transferable  Effective:  Fall 1981  Inactive:

UC Transfer:  Effective:  Inactive:

CID:

Certificate/Major Applicable:
Major Applicable Course

COURSE CONTENT

Student Learning Outcomes:
Upon completion of the course, students will 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

Laboratory Materials:
Instructor prepared materials