Lassen Community College Course Outline

CHEM 8 Introduction to Organic and Biochemistry 4.0 Units

I. Catalog Description

An introduction to organic chemistry and biochemistry. Emphasis is on the relationship between structure, properties, and function of simple and complex molecules. For nursing and allied health students. This course is web-enhanced.

Prerequisite(s): Chemistry 1A or Chemistry 45

Transfers to both UC/CSU
CSU GE Area: B1 & B3
IGETC GE Area: 5A & 5C
General Education Area: A
C-ID CHEM 102
51 Hours Lecture, 102 Expected Outside Class Hours, 51 Hours Lab, 204 Total Student Learning Hours
Scheduled: Spring

II. Coding Information

Repeatability: Not Repeatable, Take 1 Time
Grading Option: Graded or Pass/No Pass
Credit Type: Credit - Degree Applicable
TOP Code: 190500

III. Course Objectives

A. Course Student Learning Outcomes

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

1. Demonstrate a basic understanding of the fundamentals of organic chemistry and biochemistry including the language, laws, theories and processes of organic chemistry and biochemistry.
2. Communicate an understanding of the subject matter as related to the study of Chemistry

B. Course Objectives

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

1. Recognize organic functional groups and name simple organic compounds using the IUPAC system.
2. Correlate structure and reactivity to predict the types of reactions a compound will undergo and the products of these reactions.
3. Recognize general types of reactions including: oxidation, reduction, substitution, addition, elimination, hydrolysis, polymerization nucleophilic and electrophilic attack, acid-base, and condensation reactions.
4. Correlate structure and physical properties with bonding and polarity.
5. Describe and discuss isomerization including: structural, geometric, optical isomerization.
6. Recognize and name biological molecules including: sugars, lipids, amino acids, starches, proteins, and nucleic acids.

7. Correlate structure of biomolecules with reactivity and properties.
8. Correlate structure and function of biomolecules.
9. Describe and discuss metabolism and energy flows in living systems.
10. Describe and discuss mechanisms of various types of reactions.
11. Describe and discuss the replication of nucleic acids, and the synthesis of proteins.

IV. Course Content

Lecture Content

1. Introduction to organic chemistry
2. Alkanes
3. Unsaturated hydrocarbons
4. Alcohols and ethers
5. Amines
6. Aldehydes and ketones
7. Carboxylic acids
8. Derivatives of carboxylic acids
9 Optical isomerism
10. Carbohydrates
11. Lipids
12. Amino acids and proteins
13. Enzymes
14. Nucleic acids and protein synthesis
15. Metabolism

Laboratory Content

1. Structure of Organic Compounds
2. Properties of Hydrocarbons
3. Properties of alcohols and phenols
4. Properties of Ketones and Aldehydes
5. The Synthesis of Aspirin
6. Esterification
7. Saponification – Soap Making
8. Preparation of Hand Cream
9. Chromatography of Amino Acids
10. Enzyme action
11. Carbohydrates
12. Biodiesel

V. Assignments

A. Appropriate Readings

Standard college level texts, articles and papers from the chemical literature.

B. Writing Assignments

Essay examinations and laboratory reports.

C. Expected Outside Assignments

Problem solving by application of chemical principles and computation. Preparation of laboratory reports. Reading assigned materials.

D. Specific Assignments that Demonstrate Critical Thinking

This course emphasizes observation, synthesis of information to arrive at generalizations, and use of these generalizations as a basis for prediction. Essay examinations, laboratory exercises and reports require these skills.

VI. Methods of Evaluation

Traditional Classroom Instruction

Each student will be given a syllabus at the start of the class that indicates the evaluation tools to be used in the course. The course may include but not constrained to evaluation tools such as homework, quizzes, examinations, essays, laboratory reports, and presentations.

Hybrid Evaluation

All quizzes and exams will be administered during the in person class time. Students will be expected to complete online assignments and activities equivalent to in class assignments and activities for the online portion of the course. Electronic communication, both synchronous and asynchronous will be evaluated for participation and to maintain effective communication between instructor and students. There will also be assignments and activities that students are required to complete in addition to the online assignments and activities.

Online Evaluation

A variety of methods will be used, such as: research papers, asynchronous and synchronous (chat/forum) discussions, online quizzes and exams, posting to online website and email communications.

Web-enhanced course

Additional information and resources may be made available to students online. , and students may be required to do research and complete and/or submit assignments online. Quizzes may be administered online, but exams and summative assessments must be administered face-to-face.

VII. Methods of Delivery

Check those delivery methods for which, this course has been separately approved by the Curriculum/Academic Standards Committee.

☒ **Traditional Classroom Delivery** ☐ Correspondence Delivery

☒ Hybrid Delivery ☒ Online Delivery

☒ Web-enhance course

Traditional Classroom Instruction

Lecture, demonstration, multi-media presentation, discussion, laboratory manipulation

Hybrid Delivery

Hybrid modality may involve face to face instruction mixed with online instruction. A minimum of 1/3 of instruction including 100 % of labs will be face to face. The

remaining hours will be taught online through a technology platform as adopted by the district.

Online Delivery
Participation in forum based discussions. Online exercises/assignments contained on website. Web based video vignettes with discussion paper, email communications, postings to forums, online lecture notes and web links will comprise the method of instruction.

Web-Enhanced Course Delivery
Same as face to face with additional information and resources made available to students online, and students may be required to do research and complete and/or submit assignments online. Quizzes may be administered online, but exams and summative assessments must be administered face-to-face.

VIII. Representative Texts and Supplies

Standard college level texts will be required.
McMurry et al, *"Fundamentals of General, Organic, and Biological Chemistry",* 8th edition; 2017, Pearson, ISBN: 13: 9780134015187.
A laboratory manual book will be prepared and delivered by instructor

IX. Discipline/s Assignment

Chemistry

X. Course Status

Current Status: Active
Original Approval Date: 5/15/1990
Revised By: Yuting Lin
Curriculum/Academic Standards Committee Revision Date: 11/16/2021