

San José State University
Chemistry Department
Chem 130A, Biochemistry I, Fall 2019

Course and Contact Information

Instructor:	Dr. Daryl Eggers
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Office Hours:	Weds 11:45am-12:45pm, and Thurs 11:00-12:00 noon (<i>other times by appointment</i>)
Class Days/Time:	Mondays and Wednesdays 10:00-11:40am
Classroom:	DH 135 (enter from southeast corner of building)
Prerequisite:	CHEM 112B (with grades of "C" or better; "C-" not accepted)
GE/SJSU Studies Category:	Partial fulfillment of Area R

Canvas Web Page

Course materials such as syllabus, handouts, notes, assignment instructions, etc. can be found on the [Canvas Learning Management System course login website](http://sjsu.instructure.com) at <http://sjsu.instructure.com>. You are responsible for regularly checking with the messaging system through [MySJSU](http://my.sjsu.edu) at <http://my.sjsu.edu> to learn of any updates.

Course Description

CHEM 130A explores the chemistry of amino acids, carbohydrates, lipids and nucleotides. Protein structure and function, protein isolation, enzyme kinetics and enzyme mechanisms are also investigated.

Learning Outcomes and Course Goals

Learning Outcomes

CHEM 130A covers Program Learning Objective #5: Demonstrate understanding of core concepts, methods, and limits of scientific investigation to effectively solve problems in biochemistry.

GE Learning Outcomes (GELO)

GE Area R (Earth and Environment) Goal

Students will cultivate knowledge of the scientific study of the physical universe or its life forms. Students will understand and appreciate the interrelationship of science and human beings to each other.

Upon successful completion of this course, students will be able to:

1. Area R GELO (2): distinguish science from pseudoscience.
2. Area R GELO (3): apply a scientific approach to answer questions about the earth and environment. Both GELOs will be cultivated throughout the course and assessed on quizzes and exams.

Additionally, this course addresses the following GE Content Objectives:

1. Diversity: Issues of diversity shall be incorporated in an appropriate manner.
2. Civic Learning: Courses shall address the civic relevance of the topic in an appropriate manner.

Students are strongly encouraged to take courses to satisfy GE Areas R, S, and V from departments other than their major department.

Course Learning Outcomes (CLO)

Students will learn the structure and function of the major classes of biomolecules as well as the chemical and physical mechanisms of their action and the experimental basis by which these mechanisms are deduced.

Required Texts/Readings

Textbook

Nelson and Cox, *Lehninger Principles of Biochemistry*, 7th Edition. The book is available in a variety of formats including hardcover (ISBN-13: 978-1-4641-2611-6). The hardcover format is available at the Spartan Bookstore. Older additions are acceptable, but figures may not match numbering on lecture slides.

Other Readings

Alberts et al., *Molecular Biology of the Cell*, 4th edition (optional). This is a good resource for background on molecular biology concepts. It can be accessed for free on [Pubmed](http://www.ncbi.nlm.nih.gov/books/NBK21054/) at <http://www.ncbi.nlm.nih.gov/books/NBK21054/>

Papers from the scientific literature and educational videos will be noted on Canvas for either additional information on certain topics or for assigned review and summary of the material.

Library Liaison

Yen Tran (yen.tran@sjsu.edu)

Course Requirements and Assignments

Success in this course is based on the expectation that students will spend, for each unit of credit, a minimum of 45 hours over the length of the course (normally three hours per unit per week) for instruction, preparation/studying, or course related activities, including but not limited to internships, labs, and clinical practica. Other course structures will have equivalent workload expectations as described in the syllabus. More details about student workload can be found in [University Policy S12-3](http://www.sjsu.edu/senate/docs/S12-3.pdf) at <http://www.sjsu.edu/senate/docs/S12-3.pdf>.

Requirements:

Graded work will include a total of three in-class exams, one comprehensive final exam, three in-class quizzes, and one journal article summary, which all contribute to the course learning outcomes. Exams

and quizzes will be taken in class and will be administered at the beginning of class. Dates for the quizzes and exams are included in the Course Schedule. Homework problems from the text will be suggested, but not graded. It is assumed that students will do all suggested homework. Working the homework problems is an excellent way to prepare for exams and quizzes.

NOTE that [University policy F69-24](http://www.sjsu.edu/senate/docs/F69-24.pdf) at <http://www.sjsu.edu/senate/docs/F69-24.pdf> states that “Students should attend all meetings of their classes, not only because they are responsible for material discussed therein, but because active participation is frequently essential to insure maximum benefit for all members of the class. Attendance per se shall not be used as a criterion for grading.”

Final Examination or Evaluation

There will be one written final exam. The final exam will be cumulative and cover all of the concepts that we discuss during the duration of the semester. The content of the final exam will emphasize the interconnectedness between the many topics that we cover. It is expected that all students will take the final; make-up exams will not be given. The final exam must be taken at the scheduled time in order to pass the course.

Grading Information

Distribution of points is given below. The lowest quiz score of each student will be dropped from the total. Guidelines and topic choices for the journal article summary will be discussed in class.

The assignments, activities, quizzes, and exams will be weighted as follows:

Article Summary	25
Quizzes (top 3 of 4)	75
Midterm Exams (3)	300
<u>Final Exam</u>	<u>100</u>
Total Points	500

Determination of Grades

Course Grade

Letter grades will follow a traditional curve, the top 3% earning a plus grade and the bottom 3% earning a minus grade within each decade: 93.0-100% (A), 90.0-92.9% (A-), 87.0-89.9% (B+), 83.0-86.9% (B), 80.0-82.9% (B-), etc. The instructor reserves the right to lower the grading curve at the end of the semester if he deems it to be appropriate.

Missed Exams and Quizzes

If an exam or quiz is missed without a legitimate excuse a score of 0 will be entered for that exam. If an acceptable excuse is provided, then the exam grade will be prorated based on the student's average for the two other midterms and final exam. In no case will a make-up exam or quiz be given.

Note that all students have the right, within a reasonable time, to know their academic scores, to review their grade-dependent work, and to be provided with explanations for the determination of their course grades. See [University Policy F13-1](http://www.sjsu.edu/senate/docs/F13-1.pdf) at <http://www.sjsu.edu/senate/docs/F13-1.pdf> for more details.

Classroom Protocol

It is expected the students attend class and arrive on time. Since quizzes and exams are administered at the beginning of the class period, you are expected to be present at the time the quiz or exam begins. Please act in a safe and professional manner throughout the class. This includes treating yourself, your classmates, and your instructor with respect. Cell phone use is not allowed during the class. If you must take a phone call or write a text message for emergency purposes, you may step outside of the room to do so. Smartwatches are allowed during lecture but are prohibited during quizzes and exams.

At SJSU, we hope that the classroom will serve as an environment that will promote learning and the development of new ideas, as well as be a safe and respectful community. Behavior that interferes with the normal academic function in a classroom is unacceptable. Students exhibiting this behavior will be asked to leave the class. Examples of such behavior include...

- a) Persistent interruptions or using disrespectful adjectives in response to the comments of others.
- b) The use of obscene or profane language.
- c) Yelling at classmates and/or faculty.
- d) Persistent and disruptive late arrival to or early departure from class without permission.
- e) Physical threats, harassing behavior, or personal insults (even when stated in a joking manner).
- f) Use of personal electronic devices such as pagers, cell phones, PDAs in class, unless it is part of the instructional activity.

University Policies

Per [University Policy S16-9](http://www.sjsu.edu/senate/docs/S16-9.pdf) (<http://www.sjsu.edu/senate/docs/S16-9.pdf>), relevant information to all courses, such as academic integrity, accommodations, dropping and adding, consent for recording of class, etc. is available on Office of Graduate and Undergraduate Programs' [Syllabus Information web page](http://www.sjsu.edu/gup/syllabusinfo/) at <http://www.sjsu.edu/gup/syllabusinfo/>". Make sure to visit this page, review and be familiar with these university policies and resources.

Chem 130A / Biochemistry I, Fall 2019, Course Schedule

This schedule is subject to change. Changes will be noted in class.

CLASS	DATE	READINGS AND TOPICS
1	Aug. 21	Chapter 1.1, 1.4-1.5 – Biological foundations
2	Aug. 26	Chapter 1.2-1.3 – Chemical and physical foundations
3	Aug. 28	Chapter 2.1 – Water and noncovalent interactions
-	Sept. 02	Holiday – Labor Day!
4	Sept. 04	Chapter 2.2-2.3 – Weak acids and buffers
5	Sept. 09	Chapter 3.1-3.2 – Amino acids, peptides and proteins
6	Sept. 11	Quiz 1 ; Chapter 3.4 – Proteins: primary structure
7	Sept. 16	Chapter 4.1-4.2 – Proteins: secondary structure
8	Sept. 18	Chapter 4.3 – Proteins: tertiary, quaternary structure
9	Sept. 23	Chapter 3.3 – Protein purification
10	Sept. 25	EXAM I
11	Sept. 30	Chapter 4.4 – Proteins: denaturation and folding
12	Oct. 02	Chapter 4.4, 5.1 – Protein folding and intro to myoglobin
13	Oct. 07	Chapter 5.1 – Oxygen binding proteins: Mb and Hb
14	Oct. 09	Quiz 2 ; Chapter 6.1 – Intro to enzymes
15	Oct. 14	Chapter 6.1-6.2 – Enzymes: intro and function
16	Oct. 16	Chapter 6.3 – Enzyme kinetics
17	Oct. 21	Chapter 6.3 – Enzyme inhibition
18	Oct. 23	EXAM II
19	Oct. 28	Chapter 6.4 – Bisubstrate reactions and enzyme mechanisms
20	Oct. 30	Chapter 6.4 – Chymotrypsin and other examples
21	Nov. 04	Chapter 6.5 – Regulatory enzymes
22	Nov. 06	Quiz 3 ; Chapter 7.1 – Carbohydrates: monosaccharides
-	Nov. 11	Holiday – Veterans Day!
23	Nov. 13	Chapter 7.1-7.2 – Disaccharides and polysaccharides
24	Nov. 18	Chapter 7.3-7.4 – Glycoconjugates and lectins
-	Nov. 20	Chapter 10.1-10.2 – Lipids
25	Nov. 25	EXAM III
26	Nov. 27	Holiday – (Pre) Thanksgiving!
27	Dec. 02	Chapter 11.1-11.2 – Biological membranes
28	Dec. 04	Quiz 4 ; Chapter 12.1-12.2 – Topics in biosignaling
29	Dec. 09	Review
Final Exam	Dec. 17	(Tue) 7:15-9:30 AM CUMULATIVE FINAL EXAM