

San José State University
College of Science/Chemistry Department
CHEM 130A, Biochemistry I, Section 01, Fall 2021

Course and Contact Information

Instructor:	Dr. Elizabeth Migicovsky
Office Location:	Duncan Hall 605
Telephone:	(408) 924-5012
Email:	elizabeth.migicovsky@sjsu.edu (preferred method of contact)
Office Hours:	Mon/Weds 11:00AM-12:00PM via Zoom (<i>other times by appointment</i>)
Class Days/Time:	Synchronous Virtual Meetings Wednesdays 10:00AM-11:00AM
Classroom:	Online
Prerequisite:	CHEM 112B (with grade 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](#) 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> (or other communication system as indicated by the instructor) 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: 9781464126116) and loose-leaf sheets (ISBN: 9781464187964). The hardcover format is available at the Spartan Bookstore.

(Nelson and Cox, *Lehninger Principles of Biochemistry*, 6th Edition is ok too)

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](https://pubmed.ncbi.nlm.nih.gov/) at <http://www.ncbi.nlm.nih.gov/books/NBK21054/>

Readings and Videos will be posted on Canvas.

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 watching lecture videos, taking notes, reading from the textbook, and completing assignments. 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 two in-class exams, one comprehensive final exam, four take-home quizzes, one journal article summary, mini-quizzes, and participation in in-class activities, which all contribute to the course learning outcomes. Exams and quizzes will be taken online. Mini-Quizzes will be taken after the synchronous Wednesday Zoom meeting and due 5 minutes after they are posted. Take-Home Quizzes will be assigned with a deadline but no strict time limit. Exams will be given at an exact date and time. Dates for the

take-home 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 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 online at the scheduled time in order to pass the course.

Grading Information

Each assignment, exam, and quiz will have points evenly distributed throughout. The more challenging questions will be awarded more points than the simpler questions. Practice exams and quizzes will be posted on Canvas for students to assess themselves and check their learning. Throughout the semester, the problems in the back of the textbook chapters will provide a valuable resource for students to check their comprehension of the textbook material.

You will be required to read and summarize a peer reviewed journal article. A rubric and specific criteria for the literature summary will be defined on Canvas.

Every Module includes at least one Assignment. You must turn in most of these assignments by the due date to receive points for them. Points will be distributed as follows: 25 points will be awarded for participating in 85% of assignments, 20 points for 80% of assignments, 15 points for 70% of assignments, 10 points for 60% of assignments, and 5 points for 50% of assignments. A score of 0 points will be awarded for less than 50% of assignments. Assignments are counted based upon completion and effort shown.

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

Module Assignments	25
Literature Summary (1)	20
Mini Quizzes	100
Take-Home Quizzes (4)	100
Midterm Exams (2)	200
<u>Final Exam</u>	<u>100</u>
Total Points	545

Determination of Grades

Course Grade

Each exam and quiz will be given a raw score. The raw score will simply be the number of points earned for correct answers on a particular exam or quiz. The exams will also receive a scaled score. The scaled score will reflect your performance on that material as compared with your classmates. Scores will never be scaled down.

Generally, the average score on an exam will be scaled to the C range, though I reserve the right to adjust this in either direction if, in my estimation, the class overall performed differently than a “typical” class.

The course grade will be determined from the resulting average as follows:

<u>Scaled Score Average</u>	<u>Final Course Grade</u>
97-100	A+
93-96.9	A
90-92.9	A-
87-89.9	B+
83-86.9	B
80-82.9	B-
77-79.9	C+
73-76.9	C
70-72.9	C-
67-69.9	D+
63-66.9	D
60-62.9	D-
< 60	F

Missed Exams and Quizzes

If an exam or quiz is missed without a legitimate excuse a scaled score of 0 will be entered for that assignment. If an acceptable excuse is provided, then the exam grade will be prorated. In no case will a make-up exam or quiz be given.

Exam Regrades

If you feel that an error was made in the grading of your exam you may submit the exam, together with a *written* description of the error, to me for regarding not later than one week after the graded exam is returned to the class. However, I will not entertain requests for more partial credit on a problem unless the posted partial credit scheme was not properly applied to your exam. Be aware that students who submit frivolous regrade requests may become ineligible to receive future letters of recommendation from me.

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.

Virtual Classroom Protocol

It is expected the students attend virtual class on Zoom and arrive on time. Please act in a professional manner throughout the class. This includes treating yourself, your classmates, and your instructor with respect. Cell phone use is not allowed during the Zoom call.

At SJSU, we hope that the online 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 the call without permission.
- e) Physical threats, harassing behavior, or personal insults (even when stated in a joking manner).

University Policies

Per University Policy S16-9, university-wide policy information relevant to all courses, such as academic integrity, accommodations, etc. will be 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 review these university policies and resources.

General Expectations, Rights and Responsibilities of the Student

As members of the academic community, students accept both the rights and responsibilities incumbent upon all members of the institution. Students are encouraged to familiarize themselves with SJSU's policies and practices pertaining to the procedures to follow if and when questions or concerns about a class arises. To learn important campus information, view [University Policy S90-5](http://www.sjsu.edu/senate/docs/S90-5.pdf) at <http://www.sjsu.edu/senate/docs/S90-5.pdf> and SJSU current semester's [Policies and Procedures](http://info.sjsu.edu/static/catalog/policies.html), at <http://info.sjsu.edu/static/catalog/policies.html>. In general, it is recommended that students begin by seeking clarification or discussing concerns with their instructor. If such conversation is not possible, or if it does not address the issue, it is recommended that the student contact the Department Chair as the next step.

Dropping and Adding

Students are responsible for understanding the policies and procedures about add/drop, grade forgiveness, etc. Refer to the current semester's [Catalog Policies](http://info.sjsu.edu/static/catalog/policies.html) section at <http://info.sjsu.edu/static/catalog/policies.html>. Add/drop deadlines can be found on the current academic year calendars document on the [Academic Calendars webpage](http://www.sjsu.edu/provost/services/academic_calendars/) at http://www.sjsu.edu/provost/services/academic_calendars/. The [Late Drop Policy](http://www.sjsu.edu/aars/policies/latedrops/policy/) is available at <http://www.sjsu.edu/aars/policies/latedrops/policy/>. Students should be aware of the current deadlines and penalties for dropping classes.

Information about the latest changes and news is available at the [Advising Hub](http://www.sjsu.edu/advising/) at <http://www.sjsu.edu/advising/>.

Consent for Recording of Class and Public Sharing of Instructor Material

[University Policy S12-7](http://www.sjsu.edu/senate/docs/S12-7.pdf), <http://www.sjsu.edu/senate/docs/S12-7.pdf>, requires students to obtain instructor's permission to record the course and the following items to be included in the syllabus:

- Common courtesy and professional behavior dictate that you notify someone when you are recording him/her. You must obtain the instructor's permission to make audio or video recordings in this class. Such permission allows the recordings to be used for your private, study purposes only. The recordings are the intellectual property of the instructor; you have not been given any rights to reproduce or distribute the material.
- Course material developed by the instructor is the intellectual property of the instructor and cannot be shared publicly without his/her approval. You may not publicly share or upload instructor generated material for this course such as exam questions, lecture notes, or homework solutions without instructor consent. This includes all recorded lectures that appear on Canvas.

Academic integrity

Your commitment, as a student, to learning is evidenced by your enrollment at San Jose State University. The [University Academic Integrity Policy S07-2](http://www.sjsu.edu/senate/docs/S07-2.pdf) at <http://www.sjsu.edu/senate/docs/S07-2.pdf> requires you to be honest in all your academic course work. Faculty members are required to report all infractions to the office of Student Conduct and Ethical Development. The [Student Conduct and Ethical Development website](http://www.sjsu.edu/studentconduct/) is available at <http://www.sjsu.edu/studentconduct/>.

Campus Policy in Compliance with the American Disabilities Act

If you need course adaptations or accommodations because of a disability, or if you need to make special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible, or see me during office hours. [Presidential Directive 97-03](http://www.sjsu.edu/president/docs/directives/PD_1997-03.pdf) at http://www.sjsu.edu/president/docs/directives/PD_1997-03.pdf requires that students with disabilities requesting accommodations must register with the [Accessible Education Center](http://www.sjsu.edu/aec) (AEC) at <http://www.sjsu.edu/aec> to establish a record of their disability.

Accommodation to Students' Religious Holidays

San José State University shall provide accommodation on any graded class work or activities for students wishing to observe religious holidays when such observances require students to be absent from class. It is the responsibility of the student to inform the instructor, in writing, about such holidays before the add deadline at the start of each semester. If such holidays occur before the add deadline, the student must notify the instructor, in writing, at least three days before the date that he/she will be absent. It is the responsibility of the instructor to make every reasonable effort to honor the student request without penalty, and of the student to make up the work missed. See [University Policy S14-7](http://www.sjsu.edu/senate/docs/S14-7.pdf) at <http://www.sjsu.edu/senate/docs/S14-7.pdf>.

SJSU Peer Connections

Peer Connections, a campus-wide resource for mentoring and tutoring, strives to inspire students to develop their potential as independent learners while they learn to successfully navigate through their university experience. You are encouraged to take advantage of their services which include course-content based tutoring, enhanced study and time management skills, more effective critical thinking strategies, decision making and problem-solving abilities, and campus resource referrals.

In addition to offering small group, individual, and drop-in tutoring for a number of undergraduate courses, consultation with mentors is available on a drop-in or by appointment basis. Workshops are offered on a wide variety of topics including preparing for the Writing Skills Test (WST), improving your learning and memory, alleviating procrastination, surviving your first semester at SJSU, and other related topics. A computer lab and study space are also available for student use in Room 600 of Student Services Center (SSC).

Peer Connections is located in three locations: SSC, Room 600 (10th Street Garage on the corner of 10th and San Fernando Street), at the 1st floor entrance of Clark Hall, and in the Living Learning Center (LLC) in Campus Village Housing Building B. Visit [Peer Connections website](http://peerconnections.sjsu.edu) at <http://peerconnections.sjsu.edu> for more information.

SJSU Counseling and Psychological Services

The SJSU Counseling and Psychological Services is located on the corner of 7th Street and San Carlos in the new Student Wellness Center, Room 300B. Professional psychologists, social workers, and counselors are available to provide confidential consultations on issues of student mental health, campus climate or psychological and academic issues on an individual, couple, or group basis. To schedule an appointment or learn more information, visit [Counseling and Psychological Services website](http://www.sjsu.edu/counseling) at <http://www.sjsu.edu/counseling>

CHEM 130A / Biochemistry I, Fall 2021, Course Schedule

This schedule is subject to change. Changes will be noted on Canvas.

Module	Due Date	Topics
0	Aug 23-25	Introduction
1	Sept 1	Module One: Biological, Chemical, and Physical Foundations of Biochemistry
2	Sept 8	Module Two: Noncovalent Interactions, Water, pH and pKa, Buffers
3	Sept 15	Module Three: Amino Acids, Polypeptide, and Protein Primary Structure
QUIZ	Sept 20	QUIZ 1: Available Sept 17, Due Sept 20 at 11:40AM
4	Sept 22	Module Four: Protein Secondary, Tertiary, and Quaternary Structure, Fibrous Proteins
5	Sept 29	Module Five: Protein Purification, Denaturation, and Structure Analysis
QUIZ	Oct 4	QUIZ 2: Available Oct 1, Due Oct 4 at 11:40AM
6	Oct 6	Module Six: Misfolded Proteins, Binding Proteins, Myoglobin, and Hemoglobin
7	Oct 13	Module Seven: Enzyme Function and Kinetics
EXAM	Oct 18	EXAM I: Mon, Oct 18 10:00AM-11:40AM
8	Oct 20	Module Eight: Enzyme Inhibition
9	Oct 27	Module Nine: Bisubstrate Reactions and Enzyme Mechanisms
QUIZ	Nov 1	QUIZ 3: Available Oct 29, Due Nov 1 at 11:40AM
10	Nov 3	Module Ten: Monosaccharides and Disaccharides
11	Nov 10	Module Eleven: Polysaccharides and Glycoconjugates
QUIZ	Nov 15	QUIZ 4: Available Nov 12, Due Nov 15 at 11:40AM
12	Nov 17	Module Twelve: Fatty acids, Lipids, and Membranes
LIT SUM	Nov 22	Literature Summary Due
13	Nov 29	Module Thirteen: Membrane Dynamics and Transport; Signal Transduction
EXAM	Dec 1	EXAM II: Weds, Dec 1 10:00AM-11:40AM
14	Dec 6	Module Fourteen: Review
Final Exam	Dec 13	CUMULATIVE FINAL EXAM 7:15AM-9:30AM