San José State University
Chemistry Department
Biochemistry Lab, CHEM 131A, Section 1, Spring 2021

Course and Contact Information

Instructor(s):	Sonia M. Cuellar-Ortiz
Office Location:	DH 451 (off campus for Covid19 directive)
Telephone:	(408) (9242808) (off campus for Covid19 directive, no voicemail)
Email:	sonia.cuellar-ortiz@sjsu.edu *Preferred contact method is **email through Canvas**, I will do my best to respond in business hours within 48 hours. Please do not expect an answer at night, on weekends or holydays*
Other forms of communication:	Announcements will be sent to the class through Canvas, be sure to configurate your canvas app so you get such announcements in a timely manner.
Office Hours:	Mon and Wed 10:00-11:00AM (*other times by appointment*)
Class Days/Time:	Tues and Thurs 3:00-5:50PM
Classroom:	DH 609 Zoom room available in https://sjsu.instructure.com/courses/1415593
Prerequisites:	CHEM 113A, CHEM 55, and CHEM 55L (with grades of "C" or better; "C-" not accepted). CHEM 130A (Pre/Corequisite).

Course Description

Fundamental qualitative and quantitative techniques and methodology in modern biochemistry. This is a laboratory course focusing on the development of intermediate laboratory skills in modern biochemistry using the context of experiments examining biologically relevant molecules. These skills will comprise technique, the observation, recording, and evaluation of data acquired in the course of laboratory work, and the reporting of experimental results. This course is designed to foster skills in proper laboratory practice and record keeping, the use of biochemical instrumentation, the proper interpretation of experimental results, and the effective communication of the results through written reports.

Course Format

This is a **hybrid course.** Some synchronous work will be hold on mandatory zoom sessions and students must attend to laboratory sessions for the rest of the work (see schedule). Students require an internet-connected computer with ability to view and generate video and audio as well as use the plug-ins Adobe Flash Player and Adobe Acrobat Reader, among other common application. A SJSU Zoom account is required to attend online

class sessions, exams and office hours. Depending on Covid 19 emergency the examination may be held online and requires a reliable internet connection and camera.

Canvas Web Page

Course materials such as syllabus, handouts, notes, assignment instructions, etc. can be found on Canvas Learning Management System (https://sjsu.instructure.com/courses/1415593). You are responsible for regularly checking with the messaging system through MySJSU at to learn of any updates.

Student Technology Resources

Loan of some equipment (laptop or tablets) is available to students on a first-come-first-served bases. For inquires check at MLK library (https://library.sjsu.edu/student-computing-services/student-computing-services) or Information Technology (https://www.sjsu.edu/it/services/academic-tech/equipment-loaning/index.php)

Course Goals

When you complete this laboratory course, you will have achieved the following:

- reasonably adept skills with biochemical experimental techniques
- ability to collect appropriately detailed data
- skill at analyzing and interpreting data
- understanding of the limitations of any one dataset
- increased comprehension of the material covered during class sessions

Course Learning Outcomes (CLO)

Students will learn how to carry out independent experimental work in a laboratory setting while investigating a research problem, utilize appropriate instrumentation and techniques to accomplish this and communicate the results of the work in the form of a clearly written journal article

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

1. Demonstrate understanding of core concepts, methods and limits of scientific investigation to effectively solve problems in biochemistry.

2. Answer questions regarding safe practices in the laboratory and chemical safety.

3. Demonstrate safe laboratory skills (including proper handling of materials and chemical waste) for particular laboratory experiments.

4. Write a formal scientific laboratory report which applies the scientific approach to address a chemical problem and follows the format and style of an article in a peer-reviewed American Chemical Society journal.

Required Texts/Readings

Lab Manual

The lab manual will be posted on Canvas. Reading and reviewing the given experimental background is expected before coming to lab. The laboratory exercises can be found in the manual and will be supplemented with information on Canvas.

Other Readings

It is recommended to use a Basic Biochemistry textbook like the one used for previous or current Lecture classes as well as online sources to enhance your understanding of experiments. Papers from the scientific literature and educational videos will be suggested for additional information on certain topics. Some assignments require the use of primary bibliography, if a scientific paper that students wish to use is not available the **Library Liaison** (Tran, Yen. Phone: 408-808-2315. Email: yen.tran@sjsu.edu) may be able to help.

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 at http://www.sjsu.edu/senate/docs/S12-3.pdf.

This is a 3 units class so you are expected to spend 9 effective hours each week outside the class time

Note that University policy F69-24 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."

Laboratory Notebooks

For the lab, you need to have a notebook that is bound, for recording data and observations you make during each laboratory. Any bound notebook will suffice. Do not use pencil. Always use a permanent ballpoint pen. Make sure you write clearly, include all significant figures, and label all units. The clearer you are with your notebook, the easier it will be to write up your laboratory reports. Also, it is fine to write in the first person (usually plural "we"). Since you are the one(s) who performed the experiments, take credit for it.

It is imperative that all experimental data is recorded in the laboratory notebook and that this information is kept up to date. Never depend on your memory to record such data; you will probably forget it if it is not written down. Notebook entries should be clear and concise. Entries should be neat enough (and annotated when necessary) so that the experimental notes and data can be read and understood by others. If any data are rejected for some reason, neatly cross out the entry with a single line and enter a brief explanation beside it. Don't obliterate what has been written down! Never discard or tear out a notebook page. Your notebook will be graded on these criteria. Scanned pages of your notebook may be requested for evaluation, other evaluations of the Lab Notebook will be done during the on-campus sessions.

Laboratory Reports

Laboratory reports will be required for most experiments. These are to be completed outside of the laboratory period. The required content of each report will be explained in class.

Each summary/report must be typed and include figures and tables as necessary. The due dates for submission of specific reports will be provided on Canvas with ample time for preparation. Failure to submit a report by a specified deadline will automatically lower the grade by 5% of the maximum for each day it is late. This includes non-lab days. For example, if a report is due on a Tuesday and you turn it in between the beginning of class on Tuesday and midnight on Wednesday, your grade will be lowered by 5%. If you turn in the late report during class on Thursday, your grade will be lowered by 10%.

Reports are due on the due date. Reports submitted on the due date but later than the time they are due are considered late.

Students will write one "group" lab report during the semester. This is designed to encourage cooperation and participation as well as foster good writing and teaching skills. Each member of the group will receive the same grade for the group report. If any member of the group has not contributed equally to the report up to two days before the due date, that individual must write his or her report alone. It is the responsibility of the group members to let the instructor know if any member of the group is not contributing.

Formal lab reports in this course are designed to teach you about how scientific researchers write articles for publication in peer reviewed journals. These are often the articles that lead to information used by the general public to inform our health habits and our education. In the scientific community they are referred to as "primary literature."

Quizzes

Sometimes, online quizzes are required before coming to lab as part of your pre-lab. These will be short and cover the main points of the day's experiment. They are designed to assess preparedness for the lab exercise.

Final Examination

There will be one final exam. The exam will cover all the theory, experimental protocols and data analysis associated with the experiments. 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

Pre-lab assignments are graded based on completeness and correctness. Each student must show a full understanding of the experiment or exercise to be completed on the given day.

The grade for this course is heavily dependent on lab reports. Each individual lab report will be graded according to its unique rubric that will be discussed during each separate lab. The required section to be written of the report for each lab will vary, and this variation is indicated and explained in the lab manual.

Part of your grade will be an instructor evaluation. Instructor evaluation is based on technique, organization, comprehension of experiments, preparation, involvement in class discussion, involvement in group work, attention to laboratory safety and proper disposal of waste, etc.

Determination of Grades

The final exam will contribute 23% toward the grade. The reports and various assignments associated with the experiments will contribute an additional 60% points. The quality of the notebook and the pre-lab work contributes 12% and instructor evaluation comprises the remaining 5% of the total.
Pre-lab work, as described in the lab notebook section of the manual, are due before the lab begins will not be accepted after this time.

The final course grade will be determined by rounding your final score to three significant figures and assigning grades as follows:

Grading summary	**Percentage of the grade**
Lab Notebook Pre-lab work, short assignments and quizzes	12%
Lab Work, instructor evaluation	5%
Lab Reports and Worksheets	60%
Final Exam	23%
Total	**100%**

Determination of Grades

The final course grade will be determined by rounding your final score to three significant figures and assigning grades as follows:

> 97.0% = A+	96.9 – 93.0 % = A	92.9 – 90.0 % = A-
89.9 – 87.0 % = B+	86.9 – 83.0 % = B	82.9 – 80.0 % = B-
79.9 – 77.0% = C+	76.9 – 73.0 % = C	72.9 – 70.0 % = C-
69.9 – 67.0 % = D+	66.9 – 63.0 % = D	62.9 – 60.0 % = D-
<60.0% = F		

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 at http://www.sjsu.edu/senate/docs/F13-1.pdf for more details.

Classroom Protocol

You should read the safety section of the SJSU Catalog under Chemistry Department. Note in particular: "Failure to comply with proper procedures and prescribed safety cautions shall subject the student to disciplinary action. 1) Any student engages in unauthorized experimentation, or who seriously disregards safety, thereby endangering self and others shall be withdrawn immediately from the class with a grade of F. 2) Any student who shows persistent disregard for safety may have his/her grade lowered, and may risk being withdrawn with a final grade of F.

Since this is a lab course, you are expected to arrive on time with pre-lab activities prepared. For many of the experiments, you will work in groups. For the success of the group, each group member is expected to participate fully with each experiment.

At SJSU, we hope that the classroom and laboratory 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 lab 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)*, relevant university policy concerning all courses, such as student responsibilities, academic integrity, accommodations, dropping and adding, consent for recording of class, etc. and available student services (e.g. learning assistance, counseling, and other resources) are listed on Syllabus Information web page (https://www.sjsu.edu/curriculum/courses/syllabus-info.php). Make sure to visit this page to review and be aware of these university policies and resources.

Student Technology Resources

Computer labs for student use are available in the Academic Success Center at http://www.sjsu.edu/at/asc/ located on the 1st floor of Clark Hall and in the Associated Students Lab on the 2nd floor of the Student Union. Additional computer labs may be available in your department/college. Computers are also available in the Martin Luther King Library. A wide variety of audio-visual equipment is available for student checkout from Media Services located in IRC 112. These items include DV and HD digital camcorders; digital still cameras; video, slide and overhead projectors; DVD, CD, and audiotape players; sound systems, wireless microphones, projection screens and monitors.

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 at http://peerconnections.sjsu.edu for more information.

SJSU Writing Center

The SJSU Writing Center is located in Clark Hall, Suite 126. All Writing Specialists have gone through a rigorous hiring process, and they are well trained to assist all students at all levels within all disciplines to become better writers. In addition to one-on-one tutoring services, the Writing Center also offers workshops every semester on a variety of writing topics. To make an appointment or to refer to the numerous online resources offered through the Writing Center, visit the Writing Center website at http://www.sjsu.edu/writingcenter. For additional resources and updated information, follow the Writing Center on Twitter and become a fan of the SJSU Writing Center on Facebook. (Note: You need to have a QR Reader to scan this code.)

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 at http://www.sjsu.edu/counseling

CHEM 131A, Section 1, Spring 2021 Course Schedule.

The schedule is subject to change. Changes will be announced in class.

Date	Module	Experiment	Report Due date
1/28	1	Lab orientation, Expectations, Greensheet, Safety Training*	
2/2	2	Hypothesis Case Study*	
2/4	2	Research Ethics*	
2/9	3	Formatting a Lab Report*	
2/11	4	Computer Programming and Biochemistry: Python*	2/11
2/16	5	Check-in / Nuts and Bolts	
2/18	5	Check-in / Nuts and Bolts	2/18
2/23	6	pH & Buffers	
2/25	6	pH & Buffers	3/4
3/2	7	Quantification of Protein Concentration	
3/4	7	Quantification of Protein Concentration	
3/9	7	Quantification of Protein Concentration	
3/11	7	Quantification of Protein Concentration	3/18
3/16	8	Protein Structure: 3D Models*	
3/18	8	Protein Structure: 3D Models*	
3/23	8	Protein Structure: 3D Models*	3/23
3/25	9	Chimera Exercise: Neuraminidase*	
3/29 to 4/2		*Spring break*	
4/6	9	Chimera Exercise: Neuraminidase*	4/6
4/8	10	Structural Biochemistry*	
4/13	10	Structural Biochemistry*	4/13
4/15	11	Enzyme Kinetics	
4/20	11	Enzyme Kinetics	
4/22	11	Enzyme Kinetics	
4/27	11	Enzyme Kinetics	
4/29	11	Enzyme Kinetics	5/6
5/4	12	Exploring Carbohydrates	
5/6	12	Exploring Carbohydrates	
5/11	12	Exploring Carbohydrates /Check Out	
5/13	12	Exploring Carbohydrates /Check Out	5/20
	Final Monday, May 24, 14:45-17:00		

All virtual Labs are noted with an asterisk