

San José State University
Chemistry Department
CHEM 130B, Biochemistry (II), Section 01, Spring 2021

Course and Contact Information

Instructor(s):	Professor Laura Miller Conrad
Office Location:	Duncan Hall 608
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Email:	laura.miller.conrad@sjsu.edu (preferred method of contact)
Office Hours:	Monday 12 – 1 pm, Tuesday 11 am – 12 pm and by appointment
Class Days/Time:	Synchronous Zoom sessions are on Mondays from 8:30 – 10:10 am (plus Wed. 1/27); Exams are on Wednesdays (2/24, 3/24, 4/28) from 8:30 – 10:10 am
Classroom:	online (Canvas - https://sjsu.instructure.com/)
Prerequisites:	CHEM 130A and BIOL 1B/BIOL 30 (each with grades of “C” or better, “C-” not accepted)

Course Description

Continuation of CHEM 130A, concepts of bioenergetics; biochemical pathways of degradation and synthesis; metabolic regulation.

CHEM 130B is part of the three-course lecture sequence in biochemistry. Major topics focus on various aspects of metabolism, including energetics, regulation, and the anabolic and catabolic pathways of carbohydrates, lipids, amino acids and nucleotides. Control of flux of metabolites through the various pathways will be discussed in the context of efficient cellular physiology.

Course Format

Technology Intensive, Hybrid, and Online Courses

CHEM 130B will be delivered completely online. You are required to have an internet connection, computer or tablet, microphone, and camera for this course. Note: the microphone may be part of your smartphone, computer or tablet. These components will enable you to participate in Zoom class, upload assignments and record your final presentation.

Course Web Page (Canvas)

Course materials such as syllabus, handouts, notes, assignment instructions, etc. can be found on the [Canvas](http://sjsu.instructure.com) learning management system course website at <http://sjsu.instructure.com>. You are responsible for regularly checking with the messaging system used by Canvas to learn of any updates. For help with using Canvas, see [Canvas Student Resources page](http://www.sjsu.edu/ecampus/teaching-tools/canvas/student_resources) (http://www.sjsu.edu/ecampus/teaching-tools/canvas/student_resources).

Course Learning Outcomes (CLO)

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

Upon successful completion of this course, students will be able to describe and solve problems related to:

1. CLO (1): bioenergetics
2. CLO (2): metabolic pathways associated with carbohydrates, lipids, and amino acids
3. CLO (3): metabolic regulation and mechanisms of regulation
4. CLO (4): 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 softcover or hardcover (ISBN: 978-1-4641-2611-6) and loose-leaf sheets (ISBN: 978-1-4641-8796-4). The hardcover format is available at the Spartan Bookstore.

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/>.

Berg et al., *Biochemistry*, 5th edition (optional). This is an additional biochemistry text. It can be accessed for free on [Pubmed](https://www.ncbi.nlm.nih.gov/books/NBK21154/) at <https://www.ncbi.nlm.nih.gov/books/NBK21154/>.

Library Liaison

Yen Tran (yen.tran@sjsu.edu)

Course Requirements and Assignments

Graded work will include a total of three quizzes (lowest of four quizzes is dropped), three exams, one final presentation, three literature assignments, weekly homework assignments and participation in Zoom class activities, which all contribute to the course learning outcomes. Due dates for assignments are in the Course Schedule below and on Canvas. Additional 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. Work in the course will be weighted as shown below:

Assignments	Points	% of Grade
Quiz Score (Sum of top 3 scores from Quizzes 1-4)	105	14.8%
Exam 1-3	225	31.7%
Homework	65	9.2%
Participation in Zoom Class Activities	65	9.2%
Literature Assignments	150	21.1%
Final Presentation	100	14.1%
Total	710	

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 3 hours per unit per week with 1 of the hours used for lecture) for instruction or preparation/studying or course related activities including but not limited to internships, labs, clinical practica. Other course structures will have equivalent workload expectations as described in the syllabus.

Exams and Quizzes

Quizzes and a portion of the exams will be given at an exact date and time on Canvas using Respondus LockDown Browser. There will also be a take-home portion of the exam that will be administered through Gradescope. Only non-programmable calculators will be allowed on quizzes and exams.

Homework Assignments

Homework assignments in the modules will be graded for completeness and effort.

Participation in In-Class Activities

Participation in in-class activities during the synchronous Zoom sessions will be assessed by completion of the activity (for example, completion of the worksheet, voting in an iClicker poll, etc.). Note, you must be present in class during the activity to participate. Points will be distributed as follows: 65 points will be awarded for participating in 85% of activities, 50 points for 80% participation, 40 points for 70%, 25 points for 60%, and 10 points for 50%. A score of 0 points will be awarded for less than 50% participation. Your participation will be prorated for that day if a legitimate excuse is provided within 24 hours of the absence (or as soon as possible for more complicated circumstances).

Literature Assignments.

Details for the literature assignments, including rubrics, will be announced in class and posted on Canvas. Plagiarism will not be tolerated.

Final Examination or Evaluation

Our final culminating activity will be a presentation on a literature article. More guidelines and the rubric will be posted on Canvas.

Grading Information

Points will be distributed as described in Course Requirements and Assignments above. I reserve the right to scale quiz and exam grades. If scaled, each quiz or exam will be given a raw score and a scaled score. The raw score will simply be the number of points earned for correct answers on a particular exam or quiz, while the scaled score will reflect your performance on that material as compared with your classmates. The scaled score will be used to calculate your final grade. Scores will never be scaled down from your raw score. Generally, the average score on an exam will be scaled to the C range, however, I reserve the right to adjust this in either direction if, in my estimation, the class overall performed differently than a “typical” class. Note, a D minus is a passing grade for the course. The course grade will be determined from the resulting average of the point total as follows:

<u>Scaled Score Average</u>	<u>Final Course Grade</u>
97-100	A plus
93-96.9	A
90-92.9	A minus

87-89.9	B plus
83-86.9	B
80-82.9	B minus
77-79.9	C plus
73-76.9	C
70-72.9	C minus
67-69.9	D plus
63-66.9	D
60-62.9	D minus
< 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 exam. 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. Contact me in advance if you will miss a quiz or exam date for a legitimate activity. Note, the lowest quiz score will be dropped.

Exam Regrades

If you feel that an error was made in the grading of your quiz/exam you may submit the quiz/exam with a written description of the error to me for regrading not later than one week after the graded quiz/exam is returned to the class.

Late work

Assignments submitted after the due date on Canvas are considered late and subject to 5% point reduction (and subsequent 5% point reductions for each further day late). No late assignments will be accepted after the end of the Final Exam time slot (Wed. May 19 at 9:30 am).

Plagiarism

Plagiarism on literature assignments will not be tolerated and will result in a score of 0 points for the assignment.

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](http://www.sjsu.edu/senate/docs/S16-9.pdf) (<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 the [Syllabus Information web page](https://www.sjsu.edu/curriculum/courses/syllabus-info.php) (<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.

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/>. Any violations of academic integrity could result in failure of an assignment, failure of the course, or expulsion from the university.

SJSU Counseling and Psychological Services

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 through SJSU Counseling and Psychological Services (CAPS). In our current state of remote online instruction, CAPS is providing all of its services through confidential telehealth sessions. To schedule an appointment or learn more information, visit the [Counseling and Psychological Services website](http://www.sjsu.edu/counseling) at <http://www.sjsu.edu/counseling>.

CHEM 130B, Biochemistry II, Spring 2021, Course Schedule

Note – the schedule is subject to change with fair warning.

Week	Date	Readings/Topics (to be discussed during synchronous session) and Deadlines
1	Jan 27	Welcome and intro to CHEM 130B
2	Feb 1	Chapter 6.5– Regulatory enzymes; Intro to metabolism
3	Feb 8	Lit. assignment #1 due Chapter 13.1-13.4, 14.1 – Bioenergetics and reactions, Carbohydrate metabolism: glycolysis
4	Feb 15	Quiz 1 (modules 1-3) Chapter 14.1– Glycolysis
5	Feb 22	Chapter 14.1,14.3-14.5– Glycolysis, fermentation, and pentose phosphate pathway
	Feb 24	Exam 1 (modules 1-5)
6	Mar 1	Chapter 14.5 – Pentose phosphate pathway
7	Mar 8	Lit. assignment #2 due Chapter 15.4,15.1-15.2 - Glycogen metabolism; Metabolic regulation and flux
8	Mar 15	Quiz 2 (modules 6-7) Chapter 15.3,15.5, 16.1 – Regulation of carbohydrate metabolism; Citric acid cycle
9	Mar 22	Chapter 16.1 - 16.3, 19.1 - Citric acid cycle, Oxidative phosphorylation
	Mar 24	Exam 2 (modules 6-9)
<i>Spring break</i>	<i>Mar 29</i>	<i>No class</i>
10	Apr 5	Chapter 19.2-19.3 – Oxidative phosphorylation
	Apr 7	Final presentation paper selection due
11	Apr 12	Lit. assignment #3 due Chapter 19.2-19.3, 20.1, 20.3, 17.1-17.2 – Oxidative phosphorylation and photosynthesis; Fatty acid catabolism
12	Apr 19	Quiz 3 (modules 10-11) Chapter 17.3, 21.1-2, 21.4 – Ketone bodies and lipid biosynthesis
13	Apr 26	Chapter 21.4, 18.1-18.2 – Lipoproteins and amino acid catabolism
	Apr 28	Exam 3 (modules 10-13)
14	May 3	Pitch Day
15	May 10	Chapter 18.2-18.3 – Amino acid catabolism,1C metabolism and review of metabolism
16	May 17	Quiz 4 (module 15) Chapter 23.2-23.3 – Integration of metabolism (lectures 29-30)
Final	Wed, May 19 9:30 am	Final presentation due (Culminating experience)