

Chemistry 4375: Biochemistry Fall 2019

Tues/Thurs 11:00 am – 12:20 pm, **ELA 114**

**^ Note room change!
as of 21 Aug 2019**

Instructor:

Dr. Karen A. Lewis

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Office Hours: Mon, Tues, Wed, Thurs 2-3 pm and by appointment

Course Description: This course will provide Chemistry majors and minors with an overview of biochemistry topics. Topics include a description of the structure and function of proteins, enzymes, nucleic acids, lipids, and carbohydrates. This course may be stacked with CHEM 5375: Biochemistry, a graduate course dedicated to the study of the chemistry of carbohydrates, lipids, proteins, enzymes, and nucleic acids. A study of enzyme kinetics and thermodynamics of coupled reactions is included. Students enrolled in CHEM 5375 will be expected to complete additional work commensurate with a graduate-level class on both exams and assignments.

Prerequisite: CHEM 2342 (Organic Chemistry II) with a grade of C or better. If you do not have the prerequisite, you must drop this course. Failure to drop promptly will result in an administrative drop, and you may not receive a full refund for tuition and fees.

Course Format: This course will use a variety of different formats to address various learning styles. Students are expected to be active participants in their learning by reading the assigned material, intellectually engaging the material presented, and participating in classroom activities.

Course Objectives: After completion of this course, the student should be able to:

- Demonstrate a working vocabulary of biochemical terms (*i.e.*, give a definition and correctly use terms in context)
- Name, identify, and describe the function of the major biological macromolecules and their constituent building blocks
- Use chemical principles to predict and explain the behavior of biomolecules and biochemical systems
- Describe, propose, and justify the use of modern biochemical methods to address current questions in the field of biochemistry systems.

Textbook: The required textbook for the class is Lehninger Principles of Biochemistry, 7th Edition, by David L. Nelson & Michael M. Cox.. In lieu of Lehninger, either the Voet & Voet Biochemistry or Voet, Voet, & Pratt Fundamentals of Biochemistry texts are also compatible with this course. Note: students who plan to take CHEM 4385: Metabolism in Spring 2020 to complete the Biochemistry minor are advised to purchase the online Lehninger text, which will be used in CHEM 4385.

Course Grades and Assessment

The course will include a variety of assignments and exams. Only whole points may be earned. The point distribution for assessments is as follows:

Exams	400
Quizzes (best 4 of 5)	100
Final exam	<u>150</u>
Total:	650

The total points needed for each letter grade are:

A ≥ 582 pts	D 387 – 451 pts
B 517 – 581 pts	F ≤ 386 pts
C 452 – 516 pts	

The instructor reserves the right to adjust grading depending on student performance. Any changes to the above policy will be announced in class and on TRACS.

Exam Policies: Exams will begin 5 minutes after the scheduled class start time (*i.e.*, 8:05 am) and end at the scheduled class end time (*i.e.*, 9:20 am). No student will be allowed additional time without documented need by the Office of Disability Services. Please approach Dr. Lewis as early in the semester as possible to arrange ODS accommodations.

All effort is made to grade exams carefully and consistently. You may petition for corrections to an exam grade. Any exam corrections must be petitioned for in writing **no sooner than 48 hours and no later than two weeks** after the graded exams have been returned. The petition must contain a clear, written explanation of why you should receive additional points as well as evidence for the correct answer. Dr. Lewis may choose to re-grade the answer in question or the entire exam, resulting in gain or loss of points on other questions not being contested. **Grade corrections outside the above window will not be considered.**

If you must leave the room during an exam, leave your exam with Dr. Lewis. In an emergency evacuation, remain in the vicinity of the classroom if safety permits and return when allowed. Dr. Lewis will determine whether there is sufficient time to complete the exam.

Extra Credit: No individualized extra assignments will be given.

Exam Grade Replacement: At the end of the semester, students will be given the option to replace their lowest exam score with their final exam score (scaled to 100 points). Note that this is strictly an opt-in policy; the lowest exam grade will not automatically be replaced.

Attendance Policy: While attendance is not taken, ***you are expected to attend every class.*** Attendance is important to fully understand the material; merely reading the textbook is insufficient. There will be material covered in class that is not in the reading and which will be on quizzes and exams. Because attendance is not taken, there are no excused absences.

Exams: Exams must be taken on the scheduled day; make-up exams will not be given. If a student arrives late to class, they will have the remainder of the class period to complete the exam. If a student misses an exam, they may elect to replace that zero with the final exam grade as described above (“Exam Grade Replacement”). Any second missed exam will be given a zero.

Quizzes: Quizzes will be given in class. Make-up quizzes will not be given. If a student misses a quiz (whether announced or unannounced), the grade for that quiz will be a zero. At the end of the semester, the lowest quiz grade will be dropped.

TRACS: A TRACS site will be used extensively during this course for both resources and assignments. Please refer to it frequently. You must have a valid Texas State University username and password.

Email questions to instructor: You are welcome to email questions to the instructor. If the email is relevant to the entire class, the response will be posted on TRACS in the “Fall 2015 e-mail responses” folder in a manner that anonymizes the original query.

Professionalism and Respect: Both the University and Dr. Lewis are committed to an educational community in which each individual is respected, appreciated, and valued. Class rosters are provided with the student's legal name. All requests to address you by an alternate name, pronunciation, and/or gender pronoun will be honored. Please advise Dr. Lewis (either in person or by e-mail) of this preference early in the semester.

Academic Integrity: The University Honor Code “require[s] all members of this community to be conscientious, respectful, and honest”:

<http://www.txstate.edu/effective/upps/upps-07-10-01-att1.html>

More broadly, the practice of science is founded upon principles of honesty, trust, accountability, and respect. Without such a foundation, the entire enterprise would crumble. Therefore, the Honor Code is strictly enforced in this course and any violations will be pursued.

As a reminder of the critical role of academic integrity, you are expected to include the students’ pledge on all written assignments:

“I pledge to uphold the principles of honesty and responsibility at our university.”

All assignments are to be completed individually, unless you are explicitly instructed to work in groups. ***Violation of the honor code will result in academic penalties at the instructor’s discretion, up to and including failure in the course.***

Drop Policy: Students may drop this course and receive a "W" at anytime prior to the official university deadline on Monday, October 28th at 11:59 pm. Students may withdraw from the university (*i.e.*, drop all courses and go to zero hours enrolled) by Thursday, November 21st at 11:59 pm.

Special Needs Information: Students with special needs as documented by the Office of Disability Services should identify themselves at the beginning of the semester in order for accommodation to be made. If accommodations are needed for in-class quizzes and/or exams, the quizzes and/or exams must be taken at the Testing, Research Services, and Evaluation Center (TREC) on the date and time the assessment is administered in class. Students are strongly advised to schedule TREC exam times as early as possible in the semester. Exceptions to this policy will only be made under extraordinary circumstances, as determined by the instructor.

COURSE OUTLINE:

Class #	Date	Topic	Corresponding Chapter* Assignment Due Dates
1	27-Aug	Syllabus, Chemistry of Life	Chapter 1, 2
2	29-Aug	Carbohydrates	Chapter 7 (7.1, 7.2)
3	3-Sep	Carbohydrates	
4	5-Sep	Nucleic Acids	Chapter 8 <i>Quiz 1</i>
5	10-Sep	Nucleic Acids <i>Lasker Award</i>	
6	12-Sep	EXAM I	
7	17-Sep	Amino Acids	Chapter 3
8	19-Sep	Amino Acids	
9	24-Sep	Protein Structure	Chapter 4 <i>Quiz 2</i>
10	26-Sep	Protein Structure	
11	1-Oct	EXAM II <i>Nobel Prize in Physiology or Medicine</i>	
12	3-Oct	Protein Function <i>Nobel Prize in Chemistry</i>	Chapter 5
13	8-Oct	Protein Function	
14	10-Oct	Protein Function and Protein Modifications	Chapter 7 (7.3, 7.4) <i>Quiz 3</i>
15	15-Oct	Protein Function, Enzymes	Chapter 6
16	17-Oct	Enzymes	Chapter 6
17	22-Oct	Enzymes	<i>Quiz 4</i>
18	24-Oct	Enzymes	
19	29-Oct	EXAM III	
20	31-Oct	Lipids	Chapter 10
21	5-Nov	Lipids <i>Breakthrough Prize</i>	
22	7-Nov	Lipids and Lipid Modifications	Chapter 7 (7.4)
23	12-Nov	Biological Membranes	Chapter 11 <i>Quiz 5</i>
24	14-Nov	Membrane Transport	
25	19-Nov	Membrane Transport, Biosignaling	Chapter 12
26	21-Nov	Biosignaling	
27	26-Nov	EXAM IV	
	28-Nov	<i>no class - Thanksgiving Break</i>	
28	3-Dec	Biochemistry of Disease	
29	5-Dec	Biochemistry of Disease	
10-Dec 11 am		COMPREHENSIVE FINAL EXAM	

* Listed are the corresponding chapters in the textbook. Additional reading may be assigned during the semester as appropriate for the topic being discussed. Note that the above topics, schedule, and exam content are subject to change as needed. Students will be notified *in class* of any changes.