

Chemistry 370/470, Biochemistry
Fall 2021

**The instructor reserves the right to make corrections and amends on this document.*

Instructor: Dali Liu, Professor of Biochemistry
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Lectures: 4:10 – 5:00 PM, MWF, FH105
Discussions: 2:50 -3:40 PM Friday Online
Office Hours: 1:30 PM-3:30 PM on Wednesdays, Due to the ongoing covid-19 situation, it is recommended for student to make appointments for online zoom session to meet during office hours. However, students are welcome to stop by the office for in person office-hour, following in person meeting guidance below.
Pre-requisites: Organic Chemistry CHEM 222 or 224 and 226

Course Description: This is a Biochemistry course that emphasizes important biochemical concepts on the structure and function of proteins, enzymes, carbohydrates, lipids, and cell membranes as well as on the bioenergetic and regulatory principles behind the central and carbohydrate pathways. **Graduate Version of the Course:** Chem 470 is the graduate version of this Biochemistry course. It requires students to learn additional skills not required for the undergraduate (Chem 370) course that will be helpful in their careers as professional biochemists and chemists. Extra requirement for graduate students will be given as the course progresses.

Required Text: Berg, Tymoczko, Gatto and Stryer, *Biochemistry*, 9th Ed.

In person meeting guidance: Lectures and exams will be in person. According to university mandate, all students participating on campus activities need to be vaccinated. As a departmental policy, even in the event the university relaxes its universal requirement for indoor mask-wearing during the Fall 2021 semester, it will remain a principle of this class-section that, out of respect for the health of housemates and others in regular contact with members of our community, **in this class we properly wear masks at all times (e.g. over nose and mouth).**

Online guidance: **Scheduled discussions will be streaming real-time via Zoom.** Please make sure you have **Zoom** installed properly and monitor updates on **Sakai** frequently. Students will be required to turn on their cameras at the start of zoom session. Students who have a need to participate via audio only must reach out to the instructor to request audio participation only without the video camera enabled. Discussions will be recorded by the instructor and uploaded on Sakai. If necessary, lectures may be recorded as Panopto videos and uploaded on Sakai. As a student in this class, your participation in live class discussions will be recorded. These recordings will be made available **only** to students enrolled in the class, to assist those who cannot attend the live session or to serve as a resource for those who would like to review content that was presented. All recordings will become unavailable to students in the class when the course has concluded. The use of all video recordings will be in keeping with the University Privacy Statement shown below.

Privacy Statement

Assuring privacy among faculty and students engaged in online and face-to-face instructional activities helps promote open and robust conversations and mitigates concerns that comments made within the context of the class will be shared beyond the classroom. As such, recordings of instructional activities occurring in online or face-to-face classes may be used solely for internal class purposes by the faculty member and students registered for the course, and only during the period in which the course is offered. Students will be informed of such recordings by a statement in the syllabus for the course in which they will be recorded. Instructors who wish to make subsequent use of recordings that include student activity may do so only with informed written consent of the students involved or if all student activity is removed from the recording. Recordings including student activity that have been initiated by the instructor may be retained by the instructor only for individual use.

SCHEDULE OF LECTURES:

#	Day	Date	Subject	Chapters
1	M	8/30	Introduction of Biochemistry	1
2	W	9/1	Chemistry of Life Processes	1
3	F	9/3	Protein Composition & Structure	2
	M	9/6	Labor day-no class	
4	W	9/8	Protein Composition & Structure	2
5	F	9/10	Protein Composition & Structure	2
6	M	9/13	Exploring Proteins & Proteome	3
7	W	9/15	Exploring Proteins & Proteome	3
8	F	9/17	Flow of Genetic Information	4
9	M	9/20	Flow of Genetic Information	4
10	W	9/22	Exploring Genes	5
11	F	9/24	Exploring Genes	5
12	M	9/27	Test 1	1 – 5
13	W	9/29	Evolution & Bioinformatics	6
14	F	10/1	Hemoglobin	7
15	M	10/4	Hemoglobin	7
16	W	10/6	Enzymes: Basic Concepts & Kinetics	8
17	F	10/8	Enzymes: Basic Concepts & Kinetics	8
	M	10/11	Mid-Semester break-no class	
18	W	10/13	Enzymes: Catalytic Strategies	8
19	F	10/15	Enzymes: Catalytic Strategies	9
20	M	10/18	Regulation: Enzymes	10
21	W	10/20	Regulation: Enzymes	10
22	F	10/22*	Regulation: Enzymes (asynchronous)*	10
23	M	10/25	Test 2	6 – 10
24	W	10/27	Carbohydrates	11
25	F	10/29	Carbohydrates	11
26	M	11/1	Lipids and Membranes	12
27	W	11/3	Lipids and Membranes	12
28	F	11/5	Channels and Pumps	13
29	M	11/8	Channels and Pumps	13

30	W	11/10	Signal Transduction	14
31	F	11/12	Signal Transduction	14
32	M	11/15	Test 3	11 – 14
33	W	11/17	Metabolism and Bioenergetics	15
34	F	11/19	Glycolysis and Gluconeogenesis	16
35	M	11/22	Glycolysis and Gluconeogenesis	16
	W	11/24	Thanksgiving Break – no class	
	F	11/26	Thanksgiving Break – no class	
36	M	11/29	Citric Acid Cycle	17
37	W	12/2	Citric Acid Cycle	17
38	F	12/3	Thanksgiving Break – no class	
39	M	12/6	Oxidative Phosphorylation	18
40	W	12/8	Oxidative Phosphorylation	18
41	F	12/10	Review	
	F	12/17	5:30 PM Final Examination	15-18 plus 1-14

Discussion Activities: Attending the Zoom Discussion Sessions are mandatory, and they are critically beneficial to your class performance. The Discussion include the followings activities:

- A. Study Tips & Problem Solving on specific topics.
- B. Scientific Thinking Exercises:
 - a. Developing scientific perspectives
 - b. Experimental Design Practice
**The first Scientific Thinking Topic will be included in the exams.*
- C. Comprehensive Reviews for tests.

Week	Dates	Activity
1	9/3	Amino Acids, Proteins & pH problems
2	9/10	Protein Structures
3	9/17	<i>Scientific Thinking Topic: Express, purify and characterize recombinant proteins.</i>
4	9/24	Comprehensive Review for Test 1
5	10/1	DNA, RNA, Evolution
6	10/8	Enzyme Kinetics Catalysis and Regulation
7	10/15	<i>Scientific Thinking Topic: Inhibitor design against enzyme targets.</i>
8	10/22*	Comprehensive Review for Test 2 (asynchronous)*
9	10/29	Carbohydrates and Lipids
10	11/5	<i>Scientific Thinking Topic: Lipid nanoparticles.</i>
11	11/12	Comprehensive Review for Test 3
12	11/19	Central Metabolic Pathways.
	11/26	Thanksgivings
13	12/3	<i>Scientific Thinking Topic: Hereditary pathologies in the central metabolism</i>
14	12/10	Comprehensive Review for Final

Grading Policy: There are **3 tests and a final examination** during the course. There will be 100 points possible on each test and 200 on the final. The final examination will be 50% on new material and 50% on the material covered in Tests 1 to 3. If one of the regular examinations is the lowest score, it will be dropped, and the final will count 200 points. If the final examination is the lowest score, then all four examinations will count 100 points each.

If you miss a test for any reason, then your final will automatically count 200 points. If you miss more than one test a make-up examination may be given at the instructor's discretion. Minimally, a written doctor's or judge's note and notification prior to the test (via phone or e-mail) will be needed for any missed test to be made up.

Grading Sale:

A	360 (90%)
A-	348 (87%)
B+	336 (84%)
B	320 (80%)
B-	308 (77%)
C+	296 (74%)
C	280 (70%)
C-	240 (60%)
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D	200 (50%)
F	below 200 (50%)

Any request to move up the letter grade because "it is close" will be declined.

Final Examination: The University sets the schedule for all final exams. The final will be held on Friday, 12/17 from 5:30 PM to 7:30 PM. You will have exactly 2 hours to complete the exam. Additional time will not be granted, even if you start late. **There will be no make-up final exams given under any circumstance, and the exam will not be given early, either. There can be no divergence from the posted schedule of dates for final exams.** Individual students who have four (4) final examinations scheduled for the same date may request to have one of those exams rescheduled. A student having four final examinations scheduled for the same date should e-mail a petition to Adam Patricoski, Assistant Dean for Student Academic Affairs, CAS Dean's Office (apatricoski@luc.edu).

Independent Effort: Students are referred to <http://www.luc.edu/media/lucedu/cas/pdfs/academicintegrity.pdf> for the CAS Statement on Academic Integrity. Students are advised to download and read the statement as it will be part of the governance of their efforts in the course. Any student found cheating on any examination will receive an automatic "0" for that examination, which cannot be dropped. His (her) name will be reported to the Chairperson of the Chemistry and Biochemistry Department, as well as to the Dean's office of the College of Arts and Sciences, who will decide whether further disciplinary action is necessary. We remind you that academic misconduct will become part of

the record and may be transmitted to organizations such as medical schools, dental schools, pharmacy programs, graduate programs, etc. Together, we encourage you to become the best that you can be and will work with you to achieve that goal.

Students with Disabilities: If you have any special needs, please let me know in the first week of classes. The university provides services for students with disabilities. Any student who would like to use any of these university services should contact the Services for Students with Disabilities (SSWD), Sullivan Center, (773) 508-3700. Further information is available at <http://www.luc.edu/sswd/>.

Loyola University Absence Policy for Students in Co-Curricular Activities: Students missing classes while representing Loyola University Chicago in an official capacity (e.g. intercollegiate athletics, debate team, model government organization) shall be allowed by the faculty member of record to make up any assignments and to receive notes or other written information distributed in the missed classes. Students should discuss with faculty the potential consequences of missing lectures and the ways in which they can be remedied. Students must provide their instructors with proper documentation (develop standard form on web) describing the reason for and date of the absence. This documentation must be signed by an appropriate faculty or staff member, and it must be provided as far in advance of the absence as possible. It is the responsibility of the student to make up any assignments. If the student misses an examination, the instructor is required to give the student the opportunity to take the examination at another time. (<https://www.luc.edu/athleteadvising/attendance.shtml>)