Chemistry 370, Biochemistry
Fall 2024

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

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Lectures: 12:35-1:25 PM, MWF, Flanner Hall rm105
Discussions: 10:25-11:15 PM OR 11:30-12:20, Friday Flanner Hall rm 105
Office Hours: 11:00 AM-12:00 AM on MW or by appointment
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.

Learning:

The followings will be developed and mastered in Chem 370:

1. Answering knowledge and comprehension type questions related to fundamental chemical concepts and demonstrate fluency with basic facts, terminology, and principles in Biochemistry.
2. Understand and describe the chemical basis of life.

The followings will be introduced and developed in Chem 370:

3. Engage in scientific reasoning with claims based on supported evidence and communicate effectively results and interpretations of scientific research.
4. Design and implement experiments that test predictive hypotheses, gather relevant data, analyze results, and interpret the significance of these results

Required Text Book: Berg, Tymoczko, Gatto and Stryer, *Biochemistry*, 10th Ed.

Privacy Statement

Assuring privacy among faculty and students engaged in 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 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:

Chapters 10 and 13 will be excluded from exams.
Chapters from 19 and beyond will be covered in Biochemistry II (Chem 371).

#	Day	Date	Subject	Chapters
1	M	8/26	Biochemistry in space and time	1
2	W	8/28	Protein Composition & Structure	2
3	F	8/30	Protein Composition & Structure	2
	M	9/2	Labor day-no class	
4	W	9/4	Binding and Recognition	3
5	F	9/6	Binding and Recognition	3
6	M	9/9	Protein methods	4
7	W	9/11	Protein methods	4
8	F	9/13	Enzymes: Core Concepts and Kinetics	5
9	M	9/16	Enzymes: Core Concepts and Kinetics	5
10	W	9/18	Enzymes: Core Concepts and Kinetics	5
11	F	9/20	Review	1-5
12	M	9/23	Test 1	1-5
13	W	9/25	Enzyme Catalysis	6
14	F	9/27	Enzyme Catalysis	6
15	M	9/30	Enzyme Regulation	7
16	W	10/2	Enzyme Regulation	7
17	F	10/4	Flow of Genetic Information	8
	M	10/7	Mid-Semester break-no class	
18	W	10/9	Nucleic Acid Methods	9
19	F	10/11	Nucleic Acid Methods	9
20	M	10/14	Evolution and Bioinformatics	10
21	W	10/16	Evolution and Bioinformatics	10
22	F	10/18	Review	6-10
23	M	10/21	Test 2	6-10
24	W	10/23	Carbohydrates and Glycoproteins	11
25	F	10/25	Carbohydrates and Glycoproteins	11
26	M	10/28	Lipids and Membranes	12
27	W	10/30	Lipids and Membranes	12
28	F	11/1	Lipids and Membranes	12
29	M	11/4	Channels and Pumps	13
30	W	11/6	Channels and Pumps	13
31	F	11/8	Signal Transduction	14
32	M	11/11	Signal Transduction	14
33	W	11/13	Review	11-14
34	F	11/15	Test 3	11–14
35	M	11/18	Metabolism and Bioenergetics	15
36	W	11/20	Glycolysis and Gluconeogenesis	16
37	F	11/22	Glycolysis and Gluconeogenesis	16
38	M	11/25	Citric Acid Cycle	17
	W	11/27	Thanksgiving Break – no class	

	F	11/29	Thanksgiving Break – no class	
39	M	12/2	Citric Acid Cycle	17
40	W	12/4	Oxidative Phosphorylation	18
41	F	12/6	Oxidative Phosphorylation	18
	F	12/13	9:00-11:00 AM Final Examination	15-18 plus 1-14

Discussion Activities: Attending the 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	8/30	Amino Acids, Proteins & pH problems
2	9/6	Protein Structures
3	*9/13*	*Scientific Thinking Topic: Express, purify and characterize recombinant proteins.*
4	9/20	Comprehensive Review for Test 1
5	9/27	DNA, RNA, Evolution
6	10/4	Enzyme Kinetics Catalysis and Regulation
7	*10/11*	*Scientific Thinking Topic: Inhibitor design against enzyme targets.*
8	10/18	Comprehensive Review for Test 2 (asynchronous)
9	10/25	Carbohydrates and Lipids
10	*11/1*	*Scientific Thinking Topic: Lipid nanoparticles.*
11	11/8	Comprehensive Review for Test 3
12	11/15	Central Metabolic Pathways.
13	*11/22*	*Scientific Thinking Topic: Hereditary pathologies in the central metabolism*
	11/29	Thanksgivings
14	12/6	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 non-emergency 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%)
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, 12/13 from 9:00 AM to 11:00 AM.** 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 (aptricoski@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)