

**Chemistry 465, Advance Approaches in Biochemistry**  
**Fall 2023**

*\*This syllabus is tentative and will be subject for changes during continuing course design.*

**Instructors:** Professors, Dali Liu & Manisha Ray  
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**Lectures:** 6:00-7:15 PM, MW, Flanner Hall 007  
**Office Hours:** 10:30 AM-11:30 AM on Tuesdays (Liu) or by appointment; 12:00-1:00 PM on Wednesdays (Ray) or by appointment  
**Pre-requisites:** Enrollment in Graduate Program in Department of Chemistry and Biochemistry

**Course Description:** This course focus on extending student understanding in fundamental biochemistry (370-371) into contemporary branches of the biochemical research with a focus on advance methods and approaches. The course will include following areas of focus: Macromolecular Structure Determination, Contemporary Approaches in Enzymology, and Bioanalytical/Biophysical Methods.

**Recommended (Optional) Text Book:** Biochemistry 4<sup>th</sup> edition by Donald Voet and Judith Voet

### 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:

#	Day	Date	Subject
1.	M	8/28	Structure Function of Macromolecules (Review)
2.	W	8/30	Protein Isolation and Identification
	M	9/4	Labor day-no class
3.	W	9/6	Genomics, Transcriptomics and Proteomics
4.	M	9/11	Applications of Proteomics
5.	W	9/13	Biological MS Intro
6.	M	9/18	Protein MS Instrumentation
7.	W	9/20	Modern Enzymology Approaches.
8.	M	9/25	Modern Enzymology Approaches
9.	W	9/27	Modern Enzymology Approaches
10.	M	10/2	Assay Development (uv-vis, Fluorescence and Bioluminescence)
11.	W	10/4	Assay Development (uv-vis, Fluorescence and Bioluminescence)

	M	10/9-10	Mid-Semester break-no class
12.	W	10/11	Mid-Term Exam
13.	M	10/16	Biomembranes, its components and basic function
14.	W	10/18	Cell signaling, signal transduction and Membrane proteins-part I
15.	M	10/23	Cell signaling, signal transduction and Membrane proteins-part II
16.	W	10/25	Receptor-ligand binding assays-technologies and applications
17.	M	10/30	Light interferometry assay
18.	W	11/1	Binding specificity vs selectivity, their importance in drug discovery
19.	M	11/6	X-ray Protein Crystallography (Introduction)
20.	W	11/8	X-ray Protein Crystallography (Theoretical Principles)
21.	M	11/13	X-ray Protein Crystallography (Crystallization)
22.	W	11/15	Protein Crystallography (Data Collection and Processing)
23.	M	11/20	Protein Crystallography (Structure Solution)
	W	11/22-25	Thanksgiving Break – no class
24.	M	11/27	Protein Crystallography (Model building and refinement)
25.	W	11/29	X-ray Protein Crystallography (Model Validation and Structure Analysis)
26.	M	12/4	Protein NMR
27.	W	12/6	Protein NMR
	M	12/11	7:00-9:00 PM Final Examination Comprehensive

**Grading Policy:** There is one Mid-Term (45%) and one-Final (Comprehensive, 45%). A student will also complete a discussion essay on a chosen contemporary research topic (10%)

**Grading Sale:**

A	90%
A-	87%
B+	84%
B	80%
B-	77%
C+	74%
C	70%
C-	60%
D	50%
F	<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, 12/16 from 8:00 AM to 10:00 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.

**Regarding the use of Artificial Intelligence:** Loyola has released the following statement: **“Let us all make sure we are learning and sharing best practices and not allowing AI to do the learning for us.”** In this course, any work you submit for credit must represent your own ideas and understanding of the assigned material. In other words, AI will NOT be permitted in this class to complete any homework or assignments, and certainly not exams.

**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/athletheadvising/attendance.shtml> )