

Chemistry 396, Special topic in Chemistry
Biochemistry of Lipids
Fall Semester 2024

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

Instructor: Dr. Manisha Ray
Office: FH212
Phone: 773-508-3827
Email: mray2@luc.edu
Lectures: 4:15-5:30 PM, TuTh, Flanner Hall, Room 105
Discussions: Any discussion will be covered in office hours
Office Hours: 11:00 AM-12:00 PM on Tuesdays and Fridays, or by appointment in Room no. FH 212

Required materials

Study materials (power points, book chapters, reviews and journal papers) will be provided as needed by the instructor.

Prerequisite: Chem 361, Chem 224 would be helpful

Course Description

This is a special topic in Biochemistry course that mostly emphasizes important biochemical concepts on lipids, their properties, structure, and function, followed by the experimental methodologies for their detection and quantification. The course will also cover the roles of lipids in biological membrane, membrane transport, including their interaction with proteins, and related biophysical/bioanalytical techniques to study these interactions. The course will have one project on literature related to a topic of interest in the emerging field of lipidomes, and a presentation on the project.

Learning outcomes: Students will be introduced to advanced approaches to study lipids, and their characteristics properties. In a small group they will be involved in a project and a presentation on a cutting-edge research topic, which will advance their critical thinking, scientific communication, and writing skills. By successfully qualifying Chem 396, the students will be able to identify the importance of these lipids in our health and diseases.

Topics to be covered

1. Introductory review on lipids
2. Identification and Classification of Lipids
3. Detailed Nomenclature of Lipids, structure determination, drawing tool following lipid MAPS approach
4. Biosynthesis of lipids
5. Lipidomics approaches (Predominantly Mass Spectrometry approach) for characterization and quantification of lipids
6. Protocols of sample preparation
7. Properties of lipids and their roles in signaling
8. Protein-lipid interactions
9. Biochemical assays for lipids
10. Lipids and drug discovery (if time allows)

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****Please note that the schedule or topics are approximate, and the instructor has the right to make any changes in the schedule. However, the changes will be announced in sakai in advance.**

Grading Policy

There will be **one midterm, one final exam, and one presentation on their project** during the course. The grading will be based on participation, assignments, exams, and final presentation. Participation: 10%; Assignments: 20%, Two exams: 40%, Project presentation: 30%

The midterm will be held on Oct 10th During the lecture time

Grading scale:

A	93-100%	B-	74-78%
A-	88-93%	C+	68-73%
B+	83-87%	C	61-67%
B	79-82%	C-	56-60%

Absolutely no curving or adjustments will be used beyond as mentioned above.

Policy on Late or Missed work

The purpose of a universal absence accommodation policy is to account for emergency circumstances (e.g., serious illness, caring for a family member, car accident) that require you to be absent from class, while maintaining fairness in grading for students who attend and complete all in-class graded assignments. We believe that class attendance and participation are essential for your success in this class, and that your health is important to us and our shared community. Please use good judgement and stay home if necessary/prudent for your circumstances. **If you miss any deadlines or exams for valid reasons (which are not limited to: major illness or injury, death of a close family member, weather disaster, immigration issues) you must contact me by email within 48 hours of the exam to avoid a ‘F’ grade.** A doctor’s note is required for illness or injury.

Discussion Activities

Students can discuss any course related topics during the office hours, which are on Tuesdays and Fridays from 11:00 AM to 12:00 PM.

Final Examination

The University sets the schedule for all final exams. Here is a link to the LUC academic calendar: www.luc.edu/academics/schedules with important dates and deadlines.

**The final exam is cumulative and will be held on Dec 12th during the lecture time.
The final presentation will be on December 3 and 5 during the lecture time.**

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 \(aptricoski@luc.edu\)](mailto:aptricoski@luc.edu).

Important Dates

Last day to withdraw without a "W" grade: Sunday, September 8th

Last day to withdraw with a grade of "W." : Friday, November 1

Course Repeat Rule

Effective with the Fall 2017 semester, students are allowed only THREE attempts to pass Chemistry courses with a C- or better grade. The three attempts include withdrawals (W). The Department advises that it is preferable to complete a course with a grade of C or C-, and to demonstrate growth in future coursework, than to withdraw from a course. After the second attempt, the student must secure approval for a third attempt. Students must come to the Chemistry Department, fill out a [Permission to Register Form](#), and arrange a meeting with the Undergraduate Program Director, Assistant Chairperson, or Chairperson in Chemistry. If approved, a signed copy of this form is then sent to the student's Advising office to secure final permission for the attempt.

Copyright Ownership in Course Materials

The lecture materials including presentations, exams, assignments, outlines or any related materials are protected by copyright. These can only be used for your own purpose and cannot be shared or distributed outside of this class. Here is a link for the copyright and intellectual property rights if you are interested to read:

(e.g. <https://www.luc.edu/ool/onlinecourseguidelines/guidelinesforrecordingstudentsduringonlineclasses/>)

Student Accommodations

Loyola University Chicago provides reasonable accommodation for students with disabilities. Any student requesting accommodation related to a disability or other condition is required to register with the Student Accessibility Center (SAC). Professors will receive an accommodation notification from SAC, preferably within the first two weeks of class. Students are encouraged to meet with their professor individually in order to discuss their accommodations. All information will remain confidential. For more information about registering with SAC or questions about accommodations, please contact SAC at 773-508-3700 or SAC@luc.edu.

Academic Integrity

Academic integrity is the pursuit of scholarly activity in an open, honest, and responsible manner. Academic integrity is a guiding principle for all academic activity at Loyola University Chicago, and all members of the University community are expected to act in accordance with this principle. Please open and read the foldout for the third item, “Academic Integrity” in the [Undergraduate Academic Standards and Regulations](#). Academic dishonesty can take several forms, including, but not limited to cheating, plagiarism, copying another student’s work, submitting false documents, and deliberately disrupting the performance of other class members. Standards apply to both individual and group assignments. Regarding the use of Artificial Intelligence: our Provost has expressed to “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. If you are uncertain about any case where your use of AI may be in conflict with university or course standards, please see me to discuss your concerns. An instance of academic misconduct (including those detailed on the website provided above or in this syllabus) will be reported to the Department Chair and the academic Dean’s office and they will take necessary steps into action.

Please NOTE: The minimum outcome allowed in the university catalog is a 0 grade on the assessment in question

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/>.

Accommodations for Religious Reasons

If you have observances of religious holidays that will cause you to miss class or otherwise effect your academic work in the course you must alert the instructor ***no later than Friday of Week 2 in the semester*** to request accommodations. Advance notice must be sent to the instructor through Loyola email by this deadline.

Loyola University Absence Policy for Students in Co-Curricular Activities (including ROTC):

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 i.e., "[Athletic Competition & Travel Letter](#)" 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 to the professor in the first week of a semester. It is the responsibility of the student to make up any assignments. If the student misses an examination, the instructor is required to allow the student to take the examination at another time. (<https://www.luc.edu/athleteadvising/attendance.shtml>). Students who will miss class for an academic competition or conference must provide proper documentation to their instructor as early in the semester as possible. Advance notice must be sent to the instructor through Loyola email.

Online class specifics

All classes and office hours will be in person unless specifically required due to extreme weather conditions. The final presentations may occur via zoom meetings but will preferably take place in class.

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.