CHEM 361/BIOL 366
Biochemistry
Spring 2024
**The instructor reserves the right to make corrections and amends on this document.*

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Lectures: 2:45-3:35 PM, MWF, Cuneo Hall, Room 109
Discussions: Wednesdays, 10:25 am-11:15 am, 11:30 am-12:20 pm, both in Flanner Hall 105, ***there will be no discussion on May 17th
Office Hours: Friday 11am-1pm at Flanner Hall-212

Prerequisites: Organic Chemistry II (Chem 222/224)

Required materials

Textbook required: Biochemistry: An Integrative Approach with expanded topics, 1st Edition, by John Tansey.

Online WileyPlus account is required. The homework will be assigned on WileyPlus.
Here is the WileyPLUS access code for students for the bookstore: 978-1-119-76644-5.

Other Required Materials: • Computer capable of using WileyPlus • Scientific (not graphing) calculator • Access to Sakai – necessary materials are on the Sakai site

All material including videos, tutorials, exam problems, etc. of this class is copyrighted and cannot be shared outside of this class. Here is a link for the copyright and intellectual property rights (e.g., https://www.luc.edu/ool/onlinecourseguidelines/guidelinesforrecordingstudentsduringonlineclasses/).

Useful References (not required but recommended): Principles of Biochemistry by Albert L. Lehninger, David L. Nelson, and Michael M. Cox; Biochemistry by Jeremy M. Berg, John L. Tymoczko, and Lubert Stryer (any edition of either; these are not required but may be useful to you). Any additional material not found in the primary course textbook will be posted on Sakai ahead of the relevant lecture and students are not required to purchase additional books. Both recommended references are in the library and the former can sometimes be found on NCBI for free.

Course Description

Biochemistry 361/366 is an introductory course in biochemistry aimed at nonmajor students with a particular focus on building a background on basic biochemistry topics. Concepts covered are 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 through the following topics:

Topics covered: Our actual pace and the topics may vary from the schedule.

1. Chemical Foundations of Biochemistry
2. Amino acids, peptides, and proteins
3. Proteins: structure and function
4. Enzyme kinetics
5. Lipids: properties, nomenclature, synthesis, and biological function
6. Biological membrane and transport
7. Biochemical signaling
8. Carbohydrate Structure & Function
9. Glycolysis, Gluconeogenesis, and Glycogen Metabolism
10. Pyruvate and the Citric Acid Cycle
11. Electron Transport Chain & Oxidative Phosphorylation
12. Allosterism and Receptor-ligand interaction
13. Nucleic acid (DNA, RNA) and transformed biochemistry
14. Energy metabolism (Biochemical Thermodynamics)
15. Nitrogen and lipid Metabolism

If time allows, we will try to cover 16) Mechanistic details of enzymes from experimental strategies, 17) protein folding and its implication, and more details on 18) RNA, transcription, and nucleotide metabolism.

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

Students' outcome: Students will be able to demonstrate an understanding of structural-functional relationships in biological molecules. Students after successfully completing this course will have a broader understanding of a relationship between chemistry and biology.

Homework

There will be one graded homework assignment in WileyPlus per week (*except the first week*). Assignments will be given after Friday's lecture and due by 11:59 PM Central time the following Thursday (except Thanksgiving week).

Discussion

Although discussion sections are not graded, but attendance is strongly encouraged. Remember that the main source of information in this class are lectures, and discussions. Discussion will mainly focus on problem-solving question and concepts on the topics that are covered in the lecture.

Contact

To contact Dr. Ray during the semester by email put CHEM361-MWF in the Subject field. If email is sent without this specific subject, it may be sent to a SPAM folder and/or overlooked. If your email has not been answered over email over 48 hours during the business days or in class do the following: a) Check if you sent it with CHEM361-MWF in the subject field (if not, please resend

following the proper format). b) If the format is correct and it was not answered in class or during office hours, please resend it. All emails will be answered within at least 48 hours window during business days. No email interaction aside the business hours. Emails are not answered during weekends, breaks, and holidays.

Exams

There will be a total of four exams: three midterms and a final. All Exams are IN PERSON IN CLASS exams (online exams are not given and not an option) closed book, closed notes, closed Internet, closed WileyPlus. Absolutely no help on the exams may be accepted or given. Absolutely no material may be used except for calculator, pencil, eraser. Students will be expected to follow the policies of Academic Integrity and will be required to sign Honor Pledge of academic honesty. If any violation or any unauthorized internet activity is detected it will be reported and automatic F-grade will be assigned for the class. See Academic Dishonesty Statement given below.

The Exams are scheduled on the following weeks (MAKE SURE TO ALLOCATE THIS TIME SLOTS FOR YOUR EXAM, OPTIONAL PERSONAL TIMES/DATES ARE NOT POSSIBLE):

- **Exam 1 W-February 14th (during the lecture time)**
- **Exam 2 W- March 20th (during the lecture time)**
- **Exam 3 W-April 17th (during the lecture time)**
- **Final Exam -See official Loyola calendar: (May 3rd)**

Here is the link to the LUC academic calendar, www.luc.edu/academics/schedules

Grading Policy

Grading: The value of course components to the final grade is as follows:

WileyPlus homework	20%
Midterm Exam 1	20%
Midterm Exam 2	20%
Midterm Exam 3	20%
Final Exam	20%
Total	100%

Under no circumstances may any exam be taken at a time or date or place other than that assigned. The midterm and final letter grades will be given based on the points scored in the course only, please do not contact for personal or group extra-credit favors. Final grade will be determined using the table below. IMPORTANT: NO MAKE UP OR LATE EXAMS, NO MAKE UP OR LATE SUBMISSIONS of any type. To accommodate any catastrophic life events (Valid reasons for missing an exam include but are not limited to: major illness or injury, death of a close family member, weather disaster, transportation unavailable) one unit exam may be dropped, final exam MUST be taken in person (cannot be dropped) to cover the missed exam. If you miss one-unit exam for any reason above, please send Dr. Ray the documented evidence within 1 day before/after the scheduled exam, this exam cannot be taken in a different time or different day BUT this missed exam will be dropped. Do not request extra credit or make-up assignments; none will be given on request.

Students' responsibility: Students are responsible for reading all directions carefully and asking the instructor if anything is not clear. It is the student's responsibility to keep track of all

announcements, policies, and changes to the class. The instructor reserves the right to change or adjust to this syllabus as necessary, including, but not limited to, the grading policy and course schedule. The instructor will alert students via Sakai of any changes.

Approximate grading scale (letter grade is related to percentage scored in the class):

A	A-	B+	B	B-	C+	C	C-	D	F
100-93	92-90	89-87	86-83	82-80	79-77	76-73	72-70	69-60	<60

The instructor reserves the right to apply an upward curve or baseline to the final grades if needed but is under no obligation to do so.

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 or print it from the Department of Chemistry & Biochemistry website: https://www.luc.edu/chemistry/forms/ and personally meet and obtain a signature from either the Undergraduate Program Director, Assistant Chairperson, or Chairperson in Chemistry. A copy of this form is then taken to your Academic Advisor in Sullivan to secure final permission for the attempt.

Student Accommodations

Loyola University Chicago provides reasonable accommodations for students with disabilities. Any student requesting accommodations 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. Please note that in this class, software may be used to audio record class lectures in order to provide equitable access to students with disabilities. Students approved for this accommodation use recordings for their personal study only and recordings may not be shared with other people or used in any way against the faculty member, other lecturers, or students whose classroom comments are recorded as part of the class activity. Recordings are deleted at the end of the semester. For more information about registering with SAC or questions about accommodations, please contact SAC at 773-508-3700 or SAC@luc.edu.

Academic Integrity

All students in this course are expected to have read and to abide by the demanding standard of personal honesty, drafted by the College of Arts & Sciences, which can be viewed at:

https://www.luc.edu/cas/advising/academicintegritystatement/. A basic mission of a university is to search for and to communicate the truth as it is honestly perceived. A genuine learning community cannot exist unless this demanding standard is a fundamental tenet of the intellectual life of the community. Students of Loyola University Chicago are expected to know, to respect, and to practice this standard of personal honesty. 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. This class will not allow using of Artificial Intelligence (AI) in any circumstances. 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 discuss the concerns with me. 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 performance in the class you must alert the instructor ***within 10 calendar days of the first class meeting of the semester*** to request special accommodations, which will be handled on a case by case basis.

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)

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.