



LOYOLA UNIVERSITY CHICAGO

Department of Chemistry & Biochemistry
1068 W. Sheridan Rd.
Chicago, IL 60660
<https://www.luc.edu/chemistry/>

Course: **CHEM 361 (Biochemistry)**
Semester: Spring 2021
Lecture: 001-T/Th 8-9:15 AM <https://luc.zoom.us/j/86317463974>
Discussions: 002 - Th 9:45-10:35 AM <https://luc.zoom.us/j/86756050409>
003 - Th 3-3:50 PM <https://luc.zoom.us/j/83399718638>

***Attend assigned discussion section*

***Synchronous lecture/discussion may switch to asynchronous or include asynchronous supplemental material, as circumstances warrant*

***Use Zoom-Pro link in Sakai side-bar or links provided to access Zoom meetings*

***Lecture will be recorded / uploaded to Panopto (Sakai side-bar) within 2 days*

Professor: **Dr. Caitlin G. Decker, PhD**
Office Hours: <https://luc.zoom.us/j/289445029> **same link both OH
W 11:30 AM – 12:30 PM (Chem361 designated OH)
F 11:30 AM-12:30 PM (Open to all sections)

Email: cdecker@luc.edu

*** No problem-solving questions via email – only in discussion section / office hours.*

*** Use "Office Hours" link in Sakai side-bar or link provided to access zoom*

Teacher's Assistant: **Madelyn Smith** (Email: msmith72@luc.edu)
Office Hours: <https://luc.zoom.us/j/2133234459> **same link both OH
M 12:00- 1:00 PM (Chem 361 designated OH)
Th 12:30-1:30 PM (Open to all sections)

Course Description: Lecture and discussion. Survey of Biochemistry for non-majors. Structural-functional relationships of proteins, nucleic acids and cell membranes; biotechnology techniques; metabolic pathways.

Prerequisite: Chem 222 (or Chem 224 and 226)

Materials: **Required Textbook / Learning Platform**
Tansey, John T. (2019) WileyPlus Access Card & eBook for Biochemistry: An Integrative Approach with Expanded Topics, 1st ed.

Instructional Video:

https://players.brightcove.net/4931690914001/default_default/index.html?videoId=6177747652001

Course ID: **A39567**

*instructional flier also posted under Sakai Resources

Required Technology

Zoom (<https://www.luc.edu/its/itrs/teachingwithtechnology/zoom/>)

WileyPlus (included with above purchase)

Packback (registration info in a later section) - \$25

Non-graphing calculator (ie// TI-30XIIS) -\$13 (amazon)

Recommended Supplemental Textbooks

MCAT Biochemistry Review 2020-2021 - \$27 (amazon)

ISBN 978-1-5062-4865-3

- Sakai:** All students are enrolled in the class Sakai site. It is imperative that you check this site daily to keep informed of all activities.
- Packback:** Packback is an online discussion board using AI to coach students to explore their own curiosity by developing dynamic, well-researched scientific questions and responses that deepen conversation rather than end it.
Main Goals:
1) learn how to develop questions that lead to **new ideas**
2) provide a platform where your questions / ideas are **heard and considered**
3) foster **scientific discussion** between students
- Community look-up key: [18ce08f9-e31a-46d9-a400-f4cb9d34fbd7](https://packback.co/18ce08f9-e31a-46d9-a400-f4cb9d34fbd7)
*students will receive an email prompting registration – please select the correct **section**.
*Any questions regarding Packback should be sent to: Holla@packback.co
- Important Dates:** Mar 19th – Midterm Grades / Academic Alerts
Mar 29th – withdraw deadline (W vs. WF)
- Reading/
Homework:** **WileyPlus Homework Assignments (10%)**
Each homework assignment is worth 1% up to 10 assignments for a total of 10% of the over-all grade (this allows for 1 missed homework). The highest homework score will replace the lowest homework score, counting twice (this allows for a 2nd missed homework assignment). It is expected that students will read the chapters prior to the first class in which the material is presented (this should take 2-3 hours per chapter – highlight, take notes!). Homework assignments will be posted in the WileyPlus platform. The “Calendar” function is a good place to look and see what is due and when. Additional practice is encouraged using the end-of-chapter problems (odd answers at the back of the textbook). Suggested problems may be highlighted for emphasis throughout lecture and discussion. Keep in mind that for a 3-unit (3-credit) course students should spend ~9-12 hours / week studying and attempting practice problems to keep-up with the pace of the course.
**assignment content and due dates / times in WileyPlus may be edited / altered, added/removed at the professor’s discretion, as the semester dictates
**no make-up or late work accepted beyond the 2 already allowed for (see above)
- Quizzes:** Participation quizzes will be given during discussion or lecture (see schedule). The answers will be discussed immediately after the quiz, and questions on the quiz may appear on exams. Quizzes may be based on a research journal article provided 1 week in advance or on material from class. Quizzes may be assigned to individuals or groups, and may be open-note (or open-electronics) or closed.
- Participation:** **1) Attendance and Participation during Discussion (10%)**
Attendance, sign-in, and *participation* during discussion is worth 1% per section up to 10 sections for a total of 10% of the over-all grade.
**no additional points will be given for any additional attendance / sign-ins, check calendar for schedule. There will be NO make-up sections. No sign-in = no credit.

2) Packback Discussion Board (10%)

Students have the opportunity each week to post 1 question OR 1 response on the Packback community page, alternating between questions and answers each week (see calendar, split by last name). Each completed week is worth 1% up to 10 weeks for a total of 10% of the over-all grade. *Each week ends Wednesdays at 11:59 PM.* Last week to post: Wednesday Apr 28th 11:59 PM. Topics should be related to that week's lecture topics (as long as it is a scientific question, students should feel free to expand and touch on topics related to but not discussed in lecture). Responses may be made on the previous week's content / questions as well. Regardless of whether a student is writing a question or a response, they must 1) site an appropriate source (see appropriate source list below). Responses must cite a *different* source than the original question. 2) reference data from that publication in their post and 3) use questions words such as "how" and "why" rather than "what" and "does" – the idea being to encourage open-ended questions that spark a more in-depth discussion. Students are encouraged to ask additional questions in their responses to take the conversation further. Questions and answers from Packback that are referenced in class and/or on quizzes may also appear on Exams.

** no additional points will be given for additional weeks or additional questions or responses in a given week. There will be NO make-up sections.

**moderated posts (ie// no citation or not acceptable citation, no reference to data, closed-ended question) can be amended for credit before the due date – post early!

Acceptable Sources:

Pubmed journal articles

ie// <https://www.ncbi.nlm.nih.gov/pubmed/>

Academic institution webpages:

ie// <https://www.hsph.harvard.edu/news/press-releases/>

Biotech corporate webpages:

ie// <https://www.diagnostic.grifols.com/en/biological-drug-monitoring>

Science Direct journal articles

ie// <https://www.sciencedirect.com/>

Unacceptable Sources (you may use for inspiration, but then go find the source material!!)

Wikipedia

Khan University

Blogs (reddit)

Personal webpages / independent webpages ie// <https://icanhasscience.com/>

Facebook posted "news" sources

ie// https://www.vice.com/en_us/article/pawy9b/what-are-gmos-are-they-safe

Exams:

Online Exams + Final (70%)

Exams will be taken online. Exams and final are NOT cumulative; however, the material builds on prior knowledge. Exams may be entirely multiple choice or may have short answer / essay questions or matching in addition. Pdf upload may be required for long answer sections if included. The first 10 minutes on Zoom will be used for announcements and set-up prior to the start time. Exams are timed to include sufficient buffer for internet connectivity issues and file upload. Exam "clock" does not start until "Begin Assessment" is clicked.

Exam 1 – Tues Feb 16th online

Exam 2 – Tues Mar 16th online

Exam 3 – Tues Apr 6th online

FINAL - Sat, May 8th, 9-11 AM online

*Final Exam is NOT Cumulative

**There will be NO regrades for this course on any exam. Grades are final.

Exam Protocol:

- 1) Sign-in to zoom (via Sakaii course site) cameras ON at class start on a phone or other *secondary device*. **Angle camera** towards self, desk, and computer or *primary device* screen (ie// from side or behind).
- 2) Download and launch Respondus LockDown Browser on primary device <https://loyola.screenstepslive.com/s/17190/m/84387/c/329155>
- 3) Open Sakaii-based exam through LockDown app on primary device.

***SAC students will have **time and a half** from the same start-time*

***It is the students' responsibility to ensure that Respondus LockDown Browser functions on the primary device **prior** to each exam. All issues should be referred to ITRS: ITServiceDesk@luc.edu 773.508.4487*

*** Do NOT wear any headphones, although ear *plugs* are permitted*

****Announcements on Sakaii override any described procedures here**

Grading Scale:

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

***Professor reserves right to implement a curve. Grade rounded up if within 0.5% (89.5 = A- and 89.4 = B+)*

Grade:

Grades will be determined using the *higher* of the two methods below:

- 1) Participation (Discussion + Packback) + WileyPlus Homework = 30%.

Remaining 70%: All three midterms + final averaged

- 2) Participation (Discussion + Packback) + WileyPlus Homework = 30%

Remaining 70%: Top 2 mid-terms weigh $\frac{1}{4}$ each, final weighs $\frac{1}{2}$

***due to this policy there will be NO make-up exams. If you miss an exam, it will count as the "dropped" exam, and method #2 will be used to calculate the grade.*

To calculate what you need on the Final:

Ex 1) Student X wants to calculate the grade needed on the final exam in order to gain an overall score of 70% or a C- in the class. Student X has received the following scores thus far:

Homework: 70%; Packback: 80%; Discussion: 80%

Exam 1: 56%; Exam 2: 70%; Exam 3: 42%

Method 1:

$$(56+70+42+N)/4 * 0.7 + 70*0.1 + 80*0.1 + 80*0.1 = 70$$

Subtract 23 from each side, then x4 and /0.7 on each side to give:

$$56+70+42+N=268.6$$

Subtract the 3 known scores to give

$$N=100.6\%$$

Method 2:

$$(56+70+2N)/4*0.7+70*0.1 + 80*0.1 + 80*0.1 =70$$

Subtract 23 from each side, then x4 and /0.8 on each side to give:

$$56+70+2N=268.6$$

Subtract the 2 known scores to give

$$2N= 142.6$$

Divide by 2 on each side

$$N=71.3\%$$

Therefore, Student X needs to earn a score of 71.3% on the final exam in order to pass the class with an overall grade of 70% or C-

Institutional Policies:

Loyola Official Academic Calendar: www.luc.edu/academics/schedules

Incomplete Grade:

If the Final Exam is missed for extenuating circumstances (incapacitating illness, immediate family member death, fire/flood or related emergency) students must fill-out an “Incomplete Grade Form”. Be aware that the option to apply for an incomplete grade is at the discretion of the professor. Incomplete grade info: <https://www.luc.edu/regrec/faculty.shtml>

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). 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: <http://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. Students are encouraged to seek help with the course material early and often during the semester. Attend office hours regularly for assistance before any deficiencies become serious!

Accommodation Requests:

Additional time on exams, a quiet space for exams, a note-taker, or permission to record lectures can be requested for qualifying students. It is the responsibility of the student to register with SAC and to provide documentation to the professor prior to the initiation of such accommodations.

Student Accessibility Center: <https://www.luc.edu/sac/registerwithsac/>

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: <http://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, and submitting false documents.

Any instance of dishonesty (including those detailed on the website provided above or in this syllabus) will be reported to The Chair of The Department of Chemistry & Biochemistry who will decide what the next steps may be. **Lapses in academic integrity will result in a grade of 0 (zero) on the assignment or exam, which cannot be “dropped” per any other class policy.**

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 (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>)

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.

Recording of Zoom class meetings:

In this class software will be used to record live class discussions. 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. *Students will be required to turn on their cameras at the start of class. Students who have a need to participate via audio only must reach out to me to request audio participation only without the video camera enabled.* 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. Students may not share, electronically (uploading to the web) or otherwise (email, text message, in-person, etc.), any material outside of this course including but not limited to: Zoom/Panopto recordings, PowerPoint or other presentations, tests, quizzes, screenshots, handouts, journal articles, or any created material from the course. Any breach to this policy can result in legal action.

Course Content*

- Sc 1. Biomolecules - DNA, RNA, amino acids, peptides, proteins, carbohydrates, lipids (Tan.Ch 1.2)
- Sc 2. DNA, Replication, and Biotechnology (Tan. Ch 2, MCAT Ch 6)
- Sc 3. Genetic Code – RNA, Transcription, Translation (Tan. Ch 2, MCAT Ch 7)
- Sc 4. Amino Acids, Peptides, Proteins (Tan. Ch 3, MCAT Ch 1)
- Sc 5. Enzymes & Enzyme Kinetics (Tan. Ch 4, MCAT Ch 2)
- Sc 6. Proteins that are NOT Enzymes (if time allows, Tan Ch. 3.4, 8.3, 8.4, 24.2, MCAT Ch 3.1-3.2)
- Sc 7. Buffers, pH, pKa, Isoelectric point (PI), Titration (Tan. Ch 1.3, MCAT Ch 1.2)
- Sc 8. Protein expression, purification / isolation, & characterization (Tan. Ch 21, 18*, *Techniques**, MCAT Ch 3.3-3.4)
- Sc 9. Lipid structure and function (Tan Ch 9.1, MCAT Ch 5)
- Sc 10. Biological membranes (Tan. Ch 5, 8.3, 8.4, 10.7, MCAT Ch 8)
- Sc 11. Lipid and Amino Acid Metabolism (if time allows) (Tan. Ch 10, 11, MCAT Ch 11)
- Sc 12. Carbohydrate structure and function (Tan. Ch 6.1, 6.2, MCAT Ch 4)
- Sc 13. Carbohydrate metabolism I:
Glycolysis, Gluconeogenesis, Glycogenesis, Glycogenolysis (Tan Ch 23.1, 6.3, 6.4, 8.1, MCAT Ch9)
- Sc 14. Carbohydrate Metabolism II: Aerobic Respiration:
Pyruvate Fates, Citric Acid Cycle (Tan Ch 6.5, 7.1 MCAT Ch 10)
- Sc 15. Carbohydrate Metabolism III: Aerobic Respiration:
Electron transport and Oxidative phosphorylation (Tan. Ch 7.2, 7.3, MCAT Ch 10)
- Sc 16. Bioenergetics and regulation of metabolism (if time allows, Tan. Ch 1.1, 1.2, 12, MCAT Ch 12)

* indicates that only selected topics will be covered from that chapter – use as a reference based on what was covered in lecture

Attendance in lectures is crucial to understand what information was covered. Although the text covers much of the content, some course content will only be covered during lecture or in supplemental handouts. Not all announcements or topics will be posted on Sakai, so if a lecture is missed **it is the student's responsibility to watch the lecture uploaded in Panopto and contact another student in the class to obtain any missed information / hand-outs**. Please do not email the professor with regards to absences unless it is for an exam day or an extended absence.

Tentative Course Schedule/Outline:

The instructor reserves the right to adjust the schedule, assignments, and grading rubric as circumstances may warrant during the semester.

Week	Monday	Tuesday	Wednesday	Thursday	Friday
1	Jan 18 th	Jan 19 th	Jan 20 th	Jan 21 st	Jan 22 nd
	MLK	Syllabus / Sc. 1		Sc. 1 / Quiz 1	
2	Jan 25 th	Jan 26 th	Jan 27 th	Jan 28 th	Jan 29 th
		Sc. 2	A-D Packback Question	Sc. 2 / Quiz 2	
3	Feb 1 st	Feb 2 nd	Feb 3 rd	Feb 4 th	Feb 5 th
		Sc. 3	E-M Packback Question	Sc. 3/4 / Quiz 3/4	
4	Feb 8 th	Feb 9 th	Feb 10 th	Feb 11 th	Feb 12 th
		Sc. 4	N-Z Packback Question	Break 1	
5	Feb 15 th	Feb 16 th	Feb 17 th	Feb 18 th	Feb 19 th
		EXAM 1	A-D Packback Question	Sc. 5 / Quiz 5	
6	Feb 22 nd	Feb 23 rd	Feb 24 th	Feb 25 th	Feb 26 th
		Sc. 5	E-M Packback Question	Sc. 5 article / Quiz 6	
7	Mar 1 st	Mar 2 nd	Mar 3 rd	Mar 4 th	Mar 5 th
		Sc. 7	N-Z Packback Question	Sc. 7 / Quiz 7	
8	Mar 8 th	Mar 9 th	Mar 10 th	Mar 11 th	Mar 12 th
	Break 2		A-D Packback Question	Sc. 7	
9	Mar 15 th	Mar 16 th	Mar 17 th	Mar 18 th	Mar 19 th
		EXAM 2	E-M Packback Question	Sc. 8 / Quiz 8	
10	Mar 22 nd	Mar 23 rd	Mar 24 th	Mar 25 th	Mar 26 th
		Sc. 8	N-Z Packback Question	Sc. 9 / Quiz 9	
11	Mar 29 th	Mar 30 th	Mar 31 st	Apr 1 st	Apr 2 nd
		Sc. 10	A-D Packback Question	Sc. 10 / Quiz 10	Break 3
12	Apr 5 th	Apr 6 th	Apr 7 th	Apr 8 th	Apr 9 th
	Break 3	EXAM 3	E-M Packback Question	Sc. 12 / Quiz 12	
13	Apr 12 th	Apr 13 th	Apr 14 th	Apr 15 th	Apr 16 th
		Sc. 12	N-Z Packback Question	Sc. 13 / Quiz 13	
14	Apr 19 th	Apr 20 th	Apr 21 st	Apr 22 nd	Apr 23 rd
		Sc. 13	A-D Packback Question	Sc. 14 / Quiz 14	
15	Apr 26 th	Apr 27 th	Apr 28 th	Apr 29 th	Apr 30 th
		Sc. 14	N-Z Packback Question	Sc. 15 / Quiz 15	
16	May 3 rd	May 4 th	May 5 th	May 6 th	May 7 th
	Final Exam Week				

Sat
May 8th
FINAL EXAM
9-11 AM

A-D, E-M, N-Z Packback Questions -last names not listed on a given date should write response posts
 -Packback Posts due Wed 11:59 PM