



LOYOLA UNIVERSITY CHICAGO

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

Course: **Biochemistry**
CHEM 361
Semester: Spring 2020
Lecture: Section 005 - MWF 11:30 AM – 12:20 PM, Cuneo 109
Discussion: Section 006 – Th 11:55 AM – 12:45 PM, FH Room 7
Section 007 – Th 24-4:50 PM, FH Room 7

Professor: **Dr. Caitlin G. Decker, PhD**
Office: FH 200A
Office Hours: W 12:30-1:30 PM, Th 2:30-3:30 PM
Email: cdecker@luc.edu
*** No specific problem-solving questions will be answered via email. All such questions should be asked during discussion section / office hours.*

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

Prerequisite: Chem 222 (or Chem 224 and 226)

Materials: **Required Textbook**
Tymoczko, Berg, Gatto, Stryer. (2019) Biochemistry: A Short Course, 4th ed.
Available at the bookstore or at the listed pricing from the publisher:
<http://store.macmillanlearning.com/>
Loose-leaf copy + SaplingPlus (Single-Term Access*) - \$129.99
ISBN 9781319363482
Or
SaplingPlus (Single-Term Access*) - \$84.99
ISBN 9781319114831
*Single-Term Access includes eBook and content for 4 years
- class enrollment itself is available only for 1 semester

Required Technology
SaplingPlus (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.
- SaplingPlus:** SaplingPlus is an integrative online homework and eBook platform. While no assignments are required for the class, this platform provides additional practice for students. Pre-class assignments, quizzes, videos, and interactive metabolic maps are included. Hints provided for “wrong” answers. eBook is annotatable and searchable – homework directly linked to book sections.
- Packback:** Packback is an online discussion board which uses artificial intelligence 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 and ideas are **heard and considered**
3) foster **scientific discussion** between students
- Community look-up key: c5d0886e-8bbb-40b3-9376-e7a4002ad66d
*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 23rd – drop deadline
- Exams:** **Exam 1 – Friday Jan 31st**
Exam 2 – Friday Feb 28th ` **Exam 3 – Monday Mar 30th**
FINAL - Monday April 27th, 1-3 PM
- 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 (5%)**
Attendance, sign-in, and *participation* during discussion is worth 1% per section up to 5 sections for a total of 5% 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 (5%)**
Students have the opportunity each week to post 1 question and 2 responses on the Packback community page. Each completed week (1 question, 2 responses) is worth 0.5% up to 10 weeks for a total of 5% of the over-all grade. *Each week ends Sundays at 11:59 PM.* Last week to post: Sunday April 26th 11:59 PM. 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.

Exam Policies:

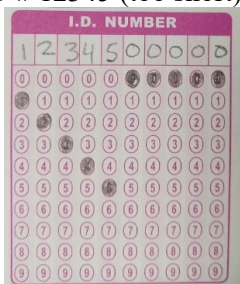
Exams and Final are NOT cumulative; however, the material builds on prior knowledge. Exams may be entirely multiple choice (scan-tron) or may have a short answer / essay section in addition. Length: 40 minutes (60 min Final). Prior to the exam start time, the first 5 minutes of class are used to write and fill-in the name, ID number, and test form. After the exam stop-time, the last 5 minutes are used to collect the exams and sign-in. A beverage and *quiet* snack are permitted (please no chips / crackers or rustling wrappers!).

Failure to adhere to the following policies will result in a grade reduction of 2% per violation, on any given exam.

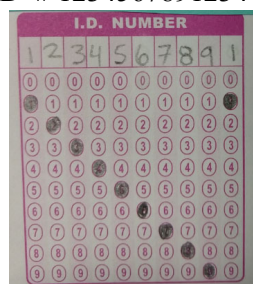
1) Proper and Prompt Identification:

Prior to the exam start (first 5 minutes), completely fill-in name, ID, and test form by both writing in the boxes AND bubbling-in the form. For the ID number: a number should be written / bubbled-in for *every available box* of the ID number. Add zeros if it is too short or leave-out the last values if it is too long (example below). After the exam, show Loyola ID to prof and sign-in.

Ex 1. ID # 12345 (too short)



Ex 2. ID # 1234567891234 (too long)



2) Equal-time:

Wait to open exams until the professor states “you may begin”. After the allotted time is up, when the prof calls “time” put-down all pencils and close all exam forms. Absolutely NO further writing is permitted.

3) Distraction-free Environment:

All electronic devices must be turned-off and inside of bags during exams, including any watches. The time will be written on the board regularly during exams. Each sound (ring, notification, etc) equates to a single violation. These items should remain off / away until after an individual *exits the room* following an exam.

4) Academic Honesty:

Individual non-graphing calculators are permitted on each exam, but may not be shared. No graphing calculators are permitted. No watches may be worn or on desks due to the prevalence of smart-watches. After the exam stop-time, refrain from talking until after you exit the classroom.

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

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

***the professor reserves the right to implement a curve, as necessary*

***grades at 0.5% are rounded up:*

ie// 89.5% is rounded to 90% A- while 89.4% is rounded down to 89% B+

Grade:

Grades will be determined using one of the two methods below (whichever results in a *higher* overall grade):

1) Participation (Discussion + Packback) = 10%.

Rest of Grade: All three midterms + final are averaged.

Thus, each exam will weigh $\frac{1}{4}$ of the remaining 90%

2) Participation (Discussion + Packback) = 10%. Rest of Grade: The top two mid-term exams weigh $\frac{1}{4}$ each, and the final will weigh $\frac{1}{2}$ of the remaining 90%. This equates to the final exam score replacing the lowest midterm score.

***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:

Participation: 7%

Exam 1: 56%

Exam 2: 70%

Exam 3: 42%

Method 1:

$$(56+70+42+N)/4 + 7 = 70$$

Subtract 7 from each side, then multiply by 4 on each side to give:

$$56+70+42+N=252$$

Subtract the 3 known scores to give

$$N=84\%$$

Method 2:

$$(56+70+2N)/4+7=70$$

Subtract 7 from each side, then multiply by 4 on each side to give:

$$56+70+2N=252$$

Subtract the 2 known scores to give

$$2N= 126$$

Divide by 2 on each side

$$N=63\%$$

Therefore, Student X needs to earn a score of 63% on the final exam in order to pass the class with an overall grade of 70% or C-

Course Content*

- Sc 1. Biomolecules - DNA, RNA, amino acids, peptides, proteins, carbohydrates, lipids (Ty. Ch 1)
- Sc 2. DNA, Replication, and Biotechnology (Ty. Ch 33, 34, 35, MCAT Ch 6)
- Sc 3. Genetic Code – RNA, Transcription, Translation (Ty. Ch 36, 37, 38, 39, 40 MCAT Ch 7)
- Sc 4. Amino Acids, Peptides, Proteins (Ty. Ch 3&4, MCAT Ch 1)
- Sc 5. Enzymes & Enzyme Kinetics (Ty. Ch 6-9, MCAT Ch 2)
- Sc 6. Proteins that are NOT Enzymes (MCAT Ch 3.1-3.2)
- Sc 7. Buffers, pH, pKa, Isoelectric point (PI), Titration (Ty. Ch. 2, MCAT Ch 1.2)
- Sc 8. Protein expression, purification / isolation, and characterization (Ty. Ch. 5, 41, MCAT Ch 3.3-3.4)
- Sc 9. Lipid structure and function (Ty. Ch. 11, MCAT Ch 5)
- Sc 10. Biological membranes (Ty. Ch. 12, MCAT Ch 8)
- Sc 11. Carbohydrate structure and function (Ty. Ch. 10, MCAT Ch 4)
- Sc 12. Carbohydrate metabolism I:
 - Glycolysis, Gluconeogenesis, Pentose Phosphate pathway (Ty. Ch. 16, 17, 24, 25, 26, MCAT Ch 9)
- Sc 13. Carbohydrate Metabolism II: Aerobic Respiration:
 - Citric Acid Cycle, electron transport and oxidative phosphorylation (Ty. Ch.18-21 MCAT Ch 10)
- Sc 14. Lipid and Amino Acid Metabolism (Ty. Ch. 27-31, MCAT Ch 11)
- Sc 15. Bioenergetics and regulation of metabolism (MCAT Ch 12)

*as this course is a 1-semester overview of Biochemistry for non-majors, selected topics will be covered. Therefore the above describes “Section or Sc Topics”, the specific chapters and parts of chapters from the reference books that correspond to various Sc will have different numbering. Attendance in lectures, therefore, is crucial to understand what information was covered. Not all announcements or topics will be posted on sakai, so if a lecture is missed **it is the student’s responsibility to 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.

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 Department of Chemistry & Biochemistry website: <http://www.luc.edu/chemistry/forms/> and obtain a signature from 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/>

Tentative Course Schedule/Outline:

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

Week	Monday	Tuesday	Wednesday	Thursday	Friday
1	<i>Jan 13th</i>	<i>Jan 14th</i>	<i>Jan 15th</i>	<i>Jan 16th</i>	<i>Jan 17th</i>
	Syllabus / Sc.1		Sc 2	Quiz 1	Sc 2
2	<i>Jan 20th</i>	<i>Jan 21st</i>	<i>Jan 22nd</i>	<i>Jan 23rd</i>	<i>Jan 24th</i>
	MLK		Sc 3	Quiz 2	Sc 3
3	<i>Jan 27th</i>	<i>Jan 28th</i>	<i>Jan 29th</i>	<i>Jan 30th</i>	<i>Jan 31st</i>
	Sc 4		Quiz 3-4	Review / Catch-up	EXAM I
4	<i>Feb 3rd</i>	<i>Feb 4th</i>	<i>Feb 5th</i>	<i>Feb 6th</i>	<i>Feb 7th</i>
	Sc 5		Sc 5	Quiz 5	Sc 5
5	<i>Feb 10th</i>	<i>Feb 11th</i>	<i>Feb 12th</i>	<i>Feb 13th</i>	<i>Feb 14th</i>
	Sc 6		Sc 6	Quiz 6	Sc 7
6	<i>Feb 17th</i>	<i>Feb 18th</i>	<i>Feb 19th</i>	<i>Feb 20th</i>	<i>Feb 21st</i>
	Sc 7		Sc 7	Quiz 7	Sc 8
7	<i>Feb 24th</i>	<i>Feb 25th</i>	<i>Feb 26th</i>	<i>Feb 27th</i>	<i>Feb 28th</i>
	Sc 8		Sc 8 / Quiz 8	Review/Catch-up	EXAM II
8	<i>Mar 2nd</i>	<i>Mar 3rd</i>	<i>Mar 4th</i>	<i>Mar 5th</i>	<i>Mar 6th</i>
	Spring Break NO CLASS				
9	<i>Mar 9th</i>	<i>Mar 10th</i>	<i>Mar 11th</i>	<i>Mar 12th</i>	<i>Mar 13th</i>
	Sc 9		Sc 10	Quiz 9	Sc 10
10	<i>Mar 16th</i>	<i>Mar 17th</i>	<i>Mar 18th</i>	<i>Mar 19th</i>	<i>Mar 20th</i>
	Sc 10		Sc 11	Quiz 10	Sc 12
11	<i>Mar 23rd</i>	<i>Mar 24th</i>	<i>Mar 25th</i>	<i>Mar 26th</i>	<i>Mar 27th</i>
	Sc 12		Sc 12	Quiz 11-12	Catch-up / Review
12	<i>Mar 30th</i>	<i>Mar 31st</i>	<i>Apr 1st</i>	<i>Apr 2nd</i>	<i>Apr 3rd</i>
	EXAM III		Sc 13	Quiz 13	Sc 13
13	<i>Apr 6th</i>	<i>Apr 7th</i>	<i>Apr 8th</i>	<i>Apr 9th</i>	<i>Apr 10th</i>
	Sc 13		Sc 14	(No Disc)	Good Friday
14	<i>Apr 13th</i>	<i>Apr 14th</i>	<i>Apr 15th</i>	<i>Apr 16th</i>	<i>Apr 17th</i>
	Easter Break		Sc 14	Quiz 14	Sc 14
15	<i>Apr 20th</i>	<i>Apr 21st</i>	<i>Apr 22nd</i>	<i>Apr 23rd</i>	<i>Apr 24th</i>
	Sc 15		Sc 15	Quiz 15	Review
16	<i>Apr 27th</i>	<i>Apr 28th</i>	<i>Apr 29th</i>	<i>Apr 30th</i>	<i>May 1st</i>
	FINAL EXAM 1-3 PM	Final Exam Week			