



Instructor: Dr. Polina Pine

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Office Location: FH-403

Office Hours: by appointment during the scheduled days of the class

Lectures: Sections 361/366-001 MWF 9:00-11:40 am See Locus for location

Sections 361/366-002/461-001 MWF 12:30-3:10 pm

Best (the fastest) way to contact Dr. Pine is in person after the lecture or during the breaks. If email is sent after 5pm during business days it may be answered the next day or within 48 hours. Emails are not answered during weekends.

Course Overview

Prerequisite: CHEM 222 or 224. Course surveys bio-molecules and processes found in living organisms. Content includes structures of amino acids, lipids, and sugars and corresponding macromolecular structures, i.e., proteins, membranes, and polysaccharides as related to their biological functions. Topics discussed in classes include: kinetics, mechanism of enzymatic reactions and the central metabolic pathways. Students who successfully complete this course will be able to do the following, at an acceptable level (including but not limited to): Identify and describe biomolecules including carbohydrates, amino acids/proteins and lipids/lipid bilayers. Choose appropriate buffer system; calculate the ratios of weak acid to conjugate base; determine the pKa from the associated titration curve; Show the major form of an amino acid/polypeptide including the zwitterion, at different pH values; track the fate of an oxygen molecule from inhalation in the lungs, track the fate of a carbon dioxide molecule produced from the TCA cycle, identify the kinetics of an enzymatic process; identify the substrates, enzymes and products in both catabolic and anabolic metabolism; track the fate of pyruvate and acetyl-CoA through the TCA cycle; track the fate and path of high-energy electrons through the electron transport complexes/respiratory chain, in conjunction with the Chemiosmotic principle of proton translocation utilized in oxidative phosphorylation to synthesize ATP, calculate the number of cycles of beta-oxidation of various fatty acids, track the synthesis of fatty acids; recognize catabolism and anabolism of amino acids.

Textbook and material (please follow the explanation given during the first lecture):

- 1. The class lectures and discussions will be the most critical source of information for this course.**
2. *Reference textbook:* Biochemistry, Campbell/ Farrell/ McDougal, 9th ed. (or earlier ed.), Brooks-Cole, Cengage Learning, 2018
3. *Supplementary textbooks for the class include:*
 - a) Pratt, Cornely, *Essential Biochemistry*, Wiley ISBN: 978-1-119-31933-7 (or any earlier edition)

- b) Dean R. Appling, Spencer J. Anthony-Cahill, Christopher K. Mathews, *Biochemistry: Concepts and Connections*; Pearson (2nd or 1st edition)

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

Chapters from the textbook (first in the list by Cengage) to be covered: 2, 3,4,5,6,7,8,15, 16,17,19,20,18,21,23, 24 (embedded in other chapters/topics). Not all textbook sections will be fully covered or covered in the order the textbook dictates, so focus first on the material that is directly covered in lecture and assigned for homework and discussion handouts) *See Tentative Lecture Schedule posted on Sakai under Recourses. Students are expected to read related material from any textbook before and after each lecture.*

- **No Taking Photos!**
- **No taking/recording Videos!**
- **No Audio recording!**
- **Using computers, cell phones, iPads, tablets is NOT allowed.** Must be put in the bags and operated on silent mode during lecture and discussion.
- **NO NOTETAKING APPS (SUCH AS NOTABILITY) ARE ALLOWED!**
- **Please note that materials from this course cannot be shared outside the course without the instructor's written permission (as reminded by the CAS Dean's Office memo, Jan. 2019).**

Learning procedure:

- Only positive, respectful behavior is tolerated in this class. Please see **Harassment (Bias)** section at the end of the Syllabus. If any not respectful behavior of any student towards other students or instructors is observed it will be reported.
- The best and fastest way to ask questions is during and after classes. You are welcome to send questions that require brief answers over email but the communication will be slower; in addition emails are not answered after 5pm and during weekends.
- To contact Dr. Pine by email put **CHEM361-YOUR SECTION in the Subject field**. If email is sent without this specific subject it may be sent to a SPAM folder and/or overlooked. The emails are not answered on MWF, since Dr. Pine is physically in the classroom; please feel free to drop by the classroom after/before the lectures with any questions.
- **It is student's responsibility to follow the announcements, and all policies of the class.**
- Make-up assignments, exams, quizzes are not available for this course. However if one of the unit-exams is missed due to serious sickness of the student, different grading weighting system may be used (generally putting higher weight on the Final Exam). To be eligible student must present documented evidence of the sickness within one week of the missed exam, missing more than one-unit exam will result in zero score for both exams. Final exam must be taken; the date and the time of the exam are **not negotiable**.

- Classes will be given as a combination of the following formats: board, multimedia, use of models, discussions, independent and facilitated case studies and problem solving.
- Dr. Pine’s lecture slides posted on Sakai may be doubling the material in the class or covering material that expected to be covered by students independently. Follow the announcements in class; ask Dr. Pine during the class, and after the lecture if anything remains unclear. **Communication is important.**
- Problems from the textbook if assigned will be related to the first textbook given above.
- The material covered in class will combine information from the textbook (not necessary complete chapter), recent scientific publications and supplementary texts. For this reason it is essential not to miss classes. Students are expected to read the textbook before and after each class based on the tentative schedule.
- The problems kits/case studies (discussion handouts) if assigned will be posted on Sakai or handed in class. If posted on Sakai students must print these handouts, bring all of them to **every class** and follow all directions given in the handout. More details will be given in the class or posted as announcement of Sakai.

Make-up assignments are not available for this course. Contact a classmate for notes, sections/topics covered if you miss a class. **For success in this course, it is important to review your notes, read the textbook and look over the slides/material prior and after class, work on homework problems if assigned every day.** DO NOT FALL BEHIND.

Attendance is not taken for credit but it is mandatory for success. Any absence or not following the policies or announcements given in class may result in poor performance in class. In addition quizzes will not be announced in advance and will be given/taken during the scheduled classes, skipping class may result in skipping quiz. There are no Makeup quizzes. No emails asking if the quiz is given in a certain days may be answered.

Due to the fast pace of the semester announcements, handouts or any material given in class may not be necessarily doubled/tripled in any electronic form (email, Sakai etc.) It is student’s responsibility to follow the announcements, and all policies or changes of the class.

Grading policy:

There are NO EXTRA ASSIGNMENTS NO MAKE-UP EXAMS OR QUIZZES.

Under no circumstances may an exam/quiz be taken at a time and date other than that assigned.

The midterm and final letter grades will be given based on the points scored in the course only. Final grade will be determined from the following:

Quizzes	10%
Unit Exam 1	25%
Unit Exam 2	25%
Final Exam	40%
Total	100%

Quizzes will not be announced in advance and will be given/taken during the classes or take home quizzes without prior announcement. Skipping class may result in skipping quiz. No emails asking if the quiz is given in a certain day/s may be answered.

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

<i>A</i>	<i>A-</i>	<i>B+</i>	<i>B</i>	<i>B-</i>	<i>C+</i>	<i>C</i>	<i>C-</i>	<i>D+</i>	<i>D</i>	<i>F</i>
100-90	89-85	80-84	75-79	70-74	65-69	60-64	55-59	50-54	40-49	less than 40

Quizzes and exams: Only mistakes such as tallying up points by the lecturer are eligible for regarding.

Our actual pace and the topics may vary from the schedule.

Tentative Lecture Schedule (students are expected to read the textbook before and after the lecture).

The exams will contain all material covered by the date of each exam or as announced. Final exam is cumulative.

Week	Day	Monday	Wednesday	Friday
1	May 20, 22, 24	CH2 Intro; Water and pH; Buffers; Henderson-Hasselbalch equation	CH2/CH3 Titration Curves; Amino Acids and Polypeptides	CH3/CH4 Protein Structure and Hemoglobin, Myoglobin
2	May 27, 29, 31	NO CLASS	CH4/CH5 (Protein purification)	CH5/CH6 (Enzyme Action & Kinetics)
3	June 3, 5, 7	Exam I CH6	CH7 Enzyme Mechanisms & Regulation	CH7/CH8 (Lipids & Membrane structure and Cellular Transport)
4	June 10, 12, 14	CH8 (Lipids & Membrane structure and Cellular Transport)	CH16 (Carbohydrate)	CH15 (Energetics)
5	June 17, 19, 21	EXAM II CH17/CH19 Glycolysis/TCA	CH19/CH20 TCA/ETC	CH20/CH18 ETC/Glycogen metabolism
6	June 24, 26, 28	CH21 Metabolism of fatty acids	CH23 Nitrogen Metabolism	FINAL EXAM

- *May 21 Last day to drop a course without a grade of "W";*
- *June 21 Last day to withdraw from session without a penalty grade of "WF"*

Students must read carefully all directions related to the exam procedure given in the booklet of each exam. Not following the direction, not reading the directions, missing the direction will not be tolerated.

There are NO EXTRA ASSIGNMENTS NO MAKE-UP EXAMS OR QUIZZES. Under no circumstances may an exam/quiz be taken at a time and date other than that assigned.

Final exam is mandatory and has to be taken during the scheduled time only (LAST LECTURE OF THE TERM) or a grade of F will automatically result. Final exam is comprehensive.

All exams will be graded within seven business days. Students must pick up their score reports or exams (if available) during the time announced by the instructor only. Issues with graded exams must be submitted within one calendar day of being returned, otherwise scores will be considered final.

The Exams procedure

Calculators, phones, headphones, tablets, smart watches and any electronic devices **are not permitted**. Come to the exam with **three** items only: **HB-2 pencil(s)**/pens, model kit, and your **Loyola ID** visible on your desk to be checked during the exam. Cumulative final exam is two hours duration.

All purses, phones, smart watches, bags, jackets, etc must be left at front of the room. Once the exam is distributed, if you exit the room for any reason before time is up, your exam is complete and will be collected.

Instructor Privileges

Instructor reserves the right to make changes and adjustments to this syllabus as necessary, including, but not limited to the grading policy and course schedule.

Students with documented evidence of the time extension must take the exams in the SAC center ONLY, with prior arrangement (usually at least one week before the exam). There will be no possibility to accommodate the extra time outside of the SAC center. The start time of the exam must be the start time of the actual lecture or scheduled in such a way that the time of the exam of the student taking the exam in the SAC center starts earlier (not later) and overlaps at least half an hour with the exam time of the class.

Final exam has to be taken during the scheduled time only! Final exam: two hours MANDATORY. The final exam must be taken ONLY on the date scheduled or a grade of F will automatically result. Cumulative final exam is two hours duration.

All exams will be graded within seven business days. Students must pick up their score reports or exams (if available) during the time announced by the instructor only (usually within one week after the scores are published). **No exams may be picked up after the aforementioned timeframe.** Issues with multiple-choice portion of graded exams must be submitted within two calendar days of being returned; short-answer portion (free response) concerns must be discussed right after the exams being returned, otherwise scores will be considered final.

A link to the official Loyola calendar can be found here:

<http://luc.edu/academics/schedules/index.shtml>

The Exams procedure

Phones, headphones, tablets, smart watches and any electronic devices **are not permitted and must be left in a bag on a silent mode**. Come to the exam with **three** items: working **HB-2 pencil(s)/pens/erasers**, calculator, and your **Loyola ID** visible on your desk to be checked during the exam.

All purses, bags, jackets, wallets, cases, etc must be left at front of the room. Once the exam is distributed, if you exit the room for any reason before time is up, your exam is complete and will be collected.

Exam booklet pages cannot be detached. If detached it is student's responsibility for lost/not-graded portion.

Instructor Privileges

Instructor reserves the right to make changes and adjustments to this syllabus as necessary, including, but not limited to the grading policy and course schedule.

Academic Integrity

Trust and integrity are important qualities in students. All submitted work must represent your own work and your own work only. Academic dishonesty of any kind, such as plagiarism and cheat sheets on exams, will not be tolerated. Any student caught cheating on an assignment in any way will receive a "zero" for that assignment and be reported to Chairperson of the Chemistry Department and the Dean School of Art and Science. For further information regarding the Academic Integrity policy and disciplinary procedures, refer to the Undergraduate Studies Catalog: http://www.luc.edu/academics/catalog/undergrad/reg_academicintegrity.shtml.

Students seeking Special Accommodations (SAC)

If you have any special needs, please bring me an official letter from the Student Accessibility Center SAC 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 Student Accessibility Center (SAC), Sullivan Center, (773) 508-3700. Further information is available at <http://www.luc.edu/sac/>.

Students with documented evidence of the time extension must take the exams in the SAC center ONLY with prior arrangement (usually at least one week before the exam). There will be no possibility to accommodate the extra time outside of the SAC center. The start time of the exam must be the start time of the actual lecture or scheduled in such a way that the time of the exam of the student taking the exam in the SAC center starts earlier (not later!) and overlaps at least 30 minutes with the exam time of the class.

Tutoring Center

The CTAE offers several different programs each semester, including class-specific tutor-led small groups, Academic Coaching groups dedicated to general academic support, and a Study Buddy Directory for students seeking out more independent collaboration with other students in the same class or subject area. For more information refer to http://www.luc.edu/tutoring/Small_Group_Info.shtml

Harassment (Bias Reporting)

It is unacceptable and a violation of university policy to harass, discriminate against or abuse any person because of his or her race, color, national origin, gender, sexual orientation, disability, religion, age or any other characteristic protected by applicable law. Such behavior threatens to destroy the environment of tolerance and mutual respect that must prevail for this university to fulfill its educational and health care mission. For this reason, every incident of harassment, discrimination or abuse undermines the aspirations and attacks the ideals of our community. The university qualifies these incidents as incidents of bias. In order to uphold our mission of being Chicago's Jesuit Catholic University-- a diverse community seeking God in all things and working to expand knowledge in the service of humanity through learning, justice and faith, any incident(s) of bias must be reported and appropriately addressed. Therefore, the Bias Response (BR) Team was created to assist members of the Loyola University Chicago community in bringing incidents of bias to the attention of the university. If you believe you are subject to such bias, you should notify the Bias Response Team at this link: <http://webapps.luc.edu/biasreporting>

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.

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) 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 make up examination at another time that fits the class schedule and requirements (<https://www.luc.edu/athleteadvising/attendance.shtml>)