



DEPARTMENT OF BIOCHEMISTRY

BCHM 361 “Molecules” Syllabus

Spring 2021, CRN 27357

INSTRUCTOR: Dr. Jeremy Lohman

office: BCHM 05
TEL: (765) 494-1087
e-mail: jlohman@purdue.edu

Office hours: held virtually by request or in person during scheduled lecture time.

LECTURE TA: Andrew DeMarco and Der-Shyang (Leo) Kao

office:
e-mail: demarco0@purdue.edu and dkao@purdue.edu

Office hours: held virtually by request or in person during scheduled lecture time.

COURSE OBJECTIVES

Students will learn that the chemical principles derived from the study of small molecules apply to macromolecules; that the special properties of water help define the structure, reactivity, and function of macromolecules; about the structures and properties of membranes, polysaccharides, oligonucleotides, and proteins, and how these macromolecules are assembled; how protein structures are determined using x-ray crystallography; the thermodynamic and kinetic principles relevant to transport, binding, and catalysis within the cell, and related energy transduction principles; how several enzymes work in detail; and how drugs can be used to block enzyme reactions.

LEARNING OUTCOMES

Able to describe the chemical structures of the building blocks of biological macromolecules, including amino acids, nucleotides, sugars and fatty acids.

Demonstrate knowledge of the higher order structures of proteins, nucleic acids and polysaccharides.

Understand the principles of enzyme catalysis and regulation.

Demonstrate knowledge of lipid membrane structure and function.

Understand how energy is harvested and utilized by biological systems.

Demonstrate knowledge of analytical and preparative methods that can be applied to biochemistry.

Biochemistry students will understand the contributions of our discipline to society, including improvements to medicine, agriculture, the economy and the environment.

TEXTBOOK

This textbook is suggested and not required, so long as you read the material in the online edition described below.

Biochemistry, (8th Edition) 2015 by J. M. Berg , J. L. Tymoczko, G. J. Gatto Jr. & L. Stryer.
ISBN-13: 978-1-4641-2610-9

Biochemistry, (5th Edition) can be found online at:

<http://www.ncbi.nlm.nih.gov/books/NBK21154/>

The links to individual sections will be listed in Brightspace modules.

LECTURE TIME AND PLACE

MWF, 10:30-11:20 am, BCHM 105 all lectures are prerecorded and available online and in person attendance is not required. Check UniTime Student Scheduling Assistant for in-person course meetings, which can be used to ask questions and receive feedback.
3 credits. 6 hours of outside preparation expected per week.

Key dates: January 20 – First class, February 17 – Reading Day, April 30 – Last class.

INSTRUCTIONAL MODALITY

Distance Learning, Lecture.

PREREQUISITES

- 1) Completion of BIOL 110, BIOL 121, or equivalent with a grade of C-minus or better
- 2) Completion of CHM 25500 or equivalent with a grade of C-minus or better
- 3) Concurrent enrollment in or prior completion of CHM 25600, or equivalent, with a grade of C-minus or better.
- 4) BCHM major status

Prior permission of the instructor is required for a waiver of any of the above.

COURSE MATERIALS

The syllabus for the course and recorded scores will be available via the Purdue University Brightspace site at: <https://purdue.brightspace.com/>

Homework assignments and other course materials will be available via Brightspace.

ASSESSMENT

The first three midterm exams ("midterms") are non-cumulative. The fourth and final exam ("final") is cumulative but will emphasize material not previously examined. Of the four scores received on the exams and the homework/quiz grade, only the top four will be considered.

Coverage for each midterm exam will be announced in class in the week prior to each exam. In general, the material will not include the previous lecture to allow students the opportunity to assimilate and master the material. Like other aspects of the course schedule, this is a guideline and is subject to change.

The grading for this course will be based on points earned for the following:

	Maximum
Midterm 1	250 points
Midterm 2	250 points
Midterm 3	250 points
Final exam	250 points
Homework	200 points + 50 points for participation*

*Each daily homework assignment is worth between 5-10 or more points. The maximum homework score is 200 points, no matter how many are turned in. This ensures that the max is achievable even if the problems are too difficult to solve, or a student misses a couple assignments. The participation points are automatically given if 90% of the homework assignments are completed and all four of the exams are taken. Should an exam be missed, the participation points may still be given after discussion with the instructor.

The cutoff values for letter grades are as follows, and will likely be lowered:

		2019	2018	2017	2016
1000-950 points	A	900 (44%)	900 (40%)	900 (26%)	900 (43%)
949-850 points	B	800 (28%)	800 (37%)	800 (47%)	750 (40%)
849-750 points	C	600 (20%)	700 (9%)	700 (20%)	650 (10%)
749-650 points	D				
599 points and below	F				

Letter grades may be accompanied by plusses and minuses with cutoffs to be determined at the end of the semester at the sole discretion of the instructor. The exceptions are: no plusses and minuses are given for letter grades of D or F. In no case will a student receive a higher grade than someone with a higher numerical score.

Only the top four scores, among the five scores recorded for midterm exams and homework/quizzes, will be used to compute the final grade. It is recommended but not required to take all four exams. (You should inform the instructor in advance if you do not intend to take one of the exams.) For this reason, **no makeup exams will be given without timely interaction with the instructor**.

The scores of exams may be normalized at the instructor's discretion, to ensure that no exam is disproportionately weighted. In general, this procedure will add points to the score achieved. In the past this has been done by allowing students to correct mistakes on their exam for partial credit.

Homework will be posted after each class and due before the next. While it is not recommended, late homework will be accepted for one subsequent lecture. Homework received after that time will not be accepted. We strongly suggest that you turn in homework daily.

EXTRA CREDIT

There is no opportunity for extra credit.

OBTAINING EXTRA HELP / OFFICE HOUR SCHEDULING

The instructor and the lecture TA will be available to answer your questions immediately after class, and during scheduled office hours. Alternatively, you can submit questions by e-mail to either person that will be answered in class or by return e-mail. Some of them will be converted to anonymized posts on the course website.

CLASS ATTENDANCE POLICY DURING COVID-19

Students are expected to attend for in-class projects in-person unless they are ill or otherwise unable to attend class. If they feel ill, have any symptoms associated with COVID-19, or suspect they have been exposed to the virus, students should stay home and contact the Protect Purdue Health Center (496-INFO).

In the current context of COVID-19, in-person attendance will not be a factor in the final grade. Students need to inform the instructor of any conflict that can be anticipated and will affect the timely submission of an assignment or the ability to take an exam.

Classroom engagement is extremely important and associated with your overall success in the course. The importance and value of course engagement and ways in which you can engage with the course content even if you are in quarantine or isolation, will be discussed at the beginning of the semester. Student survey data from Fall 2020 emphasized students' views of in-person course opportunities as critical to their learning, engagement with faculty/TAs, and ability to interact with peers.

Only the instructor can excuse a student from a course requirement or responsibility. When conflicts can be anticipated, such as for many University-sponsored activities and religious observations, the student should inform the instructor of the situation as far in advance as possible. For unanticipated or emergency conflicts, when advance notification to an instructor is not possible, the student should contact the instructor/instructional team as soon as possible by email, through Brightspace, or by phone. In cases of bereavement, quarantine, or isolation, the student or the student's representative should contact the Office of the Dean of Students via email or phone at 765-494-1747. Our course Brightspace includes a link to the Dean of Students under 'Campus Resources.'

GUIDANCE IN EVENT A STUDENT IS QUARANTINED

If you must quarantine or isolate at any point in time during the semester, please reach out to me via email so that we can communicate about how you can continue to learn remotely. Work with the Protect Purdue Health Center (PPHC) to get documentation and support, including access to an Academic Case Manager who can provide you with general guidelines/resources around communicating with your instructors, be available for academic support, and offer suggestions for how to be successful when learning remotely. Your Academic Case Manager can be reached at acmq@purdue.edu. Importantly, if you find yourself too sick to progress in the course, notify your

academic case manager and notify me via email or Brightspace. We will make arrangements based on your particular situation.

CLASSROOM GUIDANCE REGARDING PROTECT PURDUE

The [Protect Purdue Plan](#), which includes the [Protect Purdue Pledge](#), is campus policy and as such all members of the Purdue community must comply with the required health and safety guidelines. Required behaviors in this class include: staying home and contacting the Protect Purdue Health Center (496-INFO) if you feel ill or know you have been exposed to the virus, properly wearing a mask [in classrooms and campus building](#), at all times (e.g., mask covers nose and mouth, no eating/drinking in the classroom), disinfecting desk/workspace before and after use, maintaining appropriate social distancing with peers and instructors (including when entering/exiting classrooms), refraining from moving furniture, avoiding shared use of personal items, maintaining robust hygiene (e.g., handwashing, disposal of tissues) prior to, during and after class, and following all safety directions from the instructor.

Students who are not engaging in these behaviors (e.g., wearing a mask) will be offered the opportunity to comply. If non-compliance continues, possible results include instructors asking the student to leave class and instructors dismissing the whole class. Students who do not comply with the required health behaviors are violating the University Code of Conduct and will be reported to the Dean of Students Office with sanctions ranging from educational requirements to dismissal from the university.

Any student who has substantial reason to believe that another person in a campus room (e.g., classroom) is threatening the safety of others by not complying (e.g., not properly wearing a mask) may leave the room without consequence. The student is encouraged to report the behavior to and discuss the next steps with their instructor. Students also have the option of reporting the behavior to the [Office of the Student Rights and Responsibilities](#). See also [Purdue University Bill of Student Rights](#).

ACADEMIC INTEGRITY

Academic misconduct of any kind will not be tolerated in any course offered by the Department of Biochemistry. Information on Purdue's policies with regard to academic misconduct can be found at http://www.purdue.edu/studentregulations/student_conduct/regulations.html

Any incidence of academic misconduct will be reported to the Office of the Dean of Students. Academic misconduct may result in disciplinary sanctions including expulsion, suspension, probated suspension, disciplinary probation, and/or educational sanctions. In addition, such misconduct will result in punitive grading such as:

- receiving a lower or failing grade on the assignment, or
- assessing a lower or failing grade for the course

Punitive grading decisions will be made after consultation with the Office of the Dean of Students. Please note reported incidences of academic misconduct go on record for reference by other instructors. Further, a record of academic misconduct is likely to influence how current/future situations are handled.

To provide you with an unambiguous definition of academic misconduct, the following text has been excerpted from "Academic Integrity: A Guide for Students", written by Stephen Akers, Ph.D., Executive Associate Dean of Students (1995, Revised 1999, 2003), and published by the Office of the Dean of Students in cooperation with Purdue Student Government, Schleman Hall of Student Services, Room 207, 475 Stadium Mall Drive West Lafayette, IN 47907-2050.

"Purdue prohibits "dishonesty in connection with any University activity. Cheating, plagiarism, or knowingly furnishing false information to the University are examples of dishonesty." [Part 5, Section III-B-2-a, *Student Regulations*] Furthermore, the University Senate has stipulated that "the commitment of acts of cheating, lying, and deceit in any of their diverse forms (such as the use of substitutes for taking examinations, the use of illegal cribs, plagiarism, and copying during examinations) is dishonest and must not be tolerated. Moreover, knowingly to aid and abet, directly or indirectly, other parties in committing dishonest acts is in itself dishonest." [University Senate Document 72-18, December 15, 1972]

More specifically, the following are a few examples of academic dishonesty which have been discovered at Purdue University.

- substituting on an exam for another student
- substituting in a course for another student
- paying someone else to write a paper and submitting it as one's own work
- giving or receiving answers by use of signals during an exam
- copying with or without the other person's knowledge during an exam
- doing class assignments for someone else
- plagiarizing published material, class assignments, or lab reports
- turning in a paper that has been purchased from a commercial research firm or obtained from the internet
- padding items of a bibliography
- obtaining an unauthorized copy of a test in advance of its scheduled administration
- using unauthorized notes during an exam
- collaborating with other students on assignments when it is not allowed
- obtaining a test from the exam site, completing and submitting it later
- altering answers on a scored test and submitting it for a regrade
- accessing and altering grade records
- stealing class assignments from other students and submitting them as one's own
- fabricating data
- destroying or stealing the work of other students

Plagiarism is a special kind of academic dishonesty in which one person steals another person's ideas or words and falsely presents them as the plagiarist's own product. This is most likely to occur in the following ways:

- using the exact language of someone else without the use of quotation marks and without giving proper credit to the author
- presenting the sequence of ideas or arranging the material of someone else even though such is expressed in one's own words, without giving appropriate acknowledgment
- submitting a document written by someone else but representing it as one's own"

Academic integrity is one of the highest values that Purdue University holds. Individuals are encouraged to alert university officials to potential breaches of this value by either emailing integrity@purdue.edu or by calling 765-494-8778. While information may be submitted

anonymously, the more information that is submitted provides the greatest opportunity for the university to investigate the concern.

Purdue's Honor Pledge was developed by students to advance a supportive environment that promotes academic integrity and excellence. It is intended that this pledge inspires Boilermakers of all generations to stay "on track" to themselves and their University. "As a boilermaker pursuing academic excellence, I pledge to be honest and true in all that I do. Accountable together - we are Purdue."

NOTICE OF COPYRIGHT PROTECTION OF COURSE MATERIALS

Among the materials that may be protected by copyright law are the lectures, notes, and other material presented in class or as part of the course. Always assume the materials presented by an instructor are protected by copyright unless the instructor has stated otherwise. Students enrolled in, and authorized visitors to, Purdue University courses are permitted to take notes, which they may use for individual/group study or for other non-commercial purposes reasonably arising from enrollment in the course or the University generally.

Notes taken in class are, however, generally considered to be "derivative works" of the instructor's presentations and materials, and they are thus subject to the instructor's copyright in such presentations and materials. No individual is permitted to sell or otherwise barter notes, either to other students or to any commercial concern, for a course without the express written permission of the course instructor. To obtain permission to sell or barter notes, the individual wishing to sell or barter the notes must be registered in the course or must be an approved visitor to the class. Course instructors may choose to grant or not grant such permission at their own discretion, and may require a review of the notes prior to their being sold or bartered. If they do grant such permission, they may revoke it at any time, if they so choose.

EMERGENCY PREPAREDNESS

In the event of a major campus emergency, course requirements, deadlines and grading percentages are subject to changes that may be necessitated by a revised semester calendar or other circumstances. To get information about changes in this course consult the class Brightspace site or e-mail or phone the instructor.

ON-LINE COURSE EVALUATIONS

During the last two weeks of the semester, you will be provided an opportunity to evaluate this course and your instructor(s). To this end, Purdue has transitioned to online course evaluations. On Monday of the fifteenth week of classes, you will receive an official email from evaluation administrators with a link to the online evaluation site. You will have two weeks to complete this evaluation. Your participation in this evaluation is an integral part of this course. Your feedback is vital to improving education at Purdue University. I strongly urge you to participate in the evaluation system.

NON-DISCRIMINATION POLICY

Purdue University's non-discrimination policy will be upheld in this classroom. Purdue University is committed to maintaining a community which recognizes and values the inherent worth and dignity of every person; fosters tolerance, sensitivity, understanding, and mutual respect among its members; and encourages each individual to strive to reach his or her own potential. In pursuit of its goal of academic excellence, the University seeks to develop and nurture diversity. The University believes that diversity among its many members strengthens the institution, stimulates creativity, promotes the exchange of ideas, and enriches campus life.

Purdue University views, evaluates, and treats all persons in any University related activity or circumstance in which they may be involved, solely as individuals on the basis of their own personal abilities, qualifications, and other relevant characteristics.

In this course, each voice in the classroom has something of value to contribute. Please take care to respect the different experiences, beliefs and values expressed by students and staff involved in this course. We support Purdue's commitment to diversity, and welcome individuals of all ages, backgrounds, citizenships, disability, sex, education, ethnicities, family statuses, genders, gender identities, geographical locations, languages, military experience, political views, races, religions, sexual orientations, socioeconomic statuses, and work experiences

For more information, see http://www.purdue.edu/purdue/ea_eou_statement.html.

MENTAL HEALTH

Purdue University is committed to advancing the mental health and well-being of its students. If you or someone you know is feeling overwhelmed, depressed, and/or in need of support, services are available. For help, such individuals should contact Counseling and Psychological Services (CAPS) at (765)494-6995 or <http://www.purdue.edu/caps/> after hours, on weekends and holidays, or by going to the CAPS office of the second floor of the Purdue University Student Health Center (PUSH) during business hours.

ACCESSIBILITY AND ACCOMODATIONS

Purdue University strives to make learning experiences as accessible as possible. If you anticipate or experience physical or academic barriers based on disability, you are welcome to let me know so that we can discuss options. You are also encouraged to contact the Disability Resource Center at: drc@purdue.edu or by phone: 765-494-1247.

DISCLAIMER

This syllabus is subject to change.

LECTURE SCHEDULE

A list of topics and suggested readings in the text will be provided during the first week of class. The duration of each topic is subject to change.