



DEPARTMENT OF BIOCHEMISTRY

BCHM 361 “Molecules” Syllabus

Spring 2017

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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.

DEPARTMENTAL 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.

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/>

LECTURE TIME AND PLACE

MWF, 10:30-11:20 am, BCHM 105

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 Blackboard Learn site at: <https://mycourses.purdue.edu/>

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

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 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*

*Each daily homework assignment is worth up to 6 points, graded for effort. The maximum homework score is 200 points, no matter how many are turned in.

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

1000-950 points	A
949-850 points	B
849-750 points	C
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, will be used to compute the final grade. It is recommended but not required to attend 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.**

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. A student will remain in the same relative position respective to the mean of scores achieved by students *who complete the course and receive final course grades*. For instance, a score that is 1 standard deviation above the mean will remain so. Since one exam score is dropped, this protects those who have done particularly well on a low-scoring exam.

Homework will be collected at the beginning of each class, marked for effort, and returned during class. Each homework should be marked prominently with the assignment number from the web site. *Homework must be hand-written; computer printouts etc. will not be graded.* (Exceptions will only be granted if and when a Disability Resource Center Accommodation Letter that specifically addresses this issue is provided.) While it is not recommended, late homework will be accepted for two subsequent lectures, but *only* at the beginning of class. Homework received after that time will not be accepted. We strongly suggest that you turn in homework daily. *Students may find it helpful to do their homework in a spiral notebook or similar, which should be opened to the correct page to help the TA.*

If there is an obvious mistake in the grading of a question or the addition of exam scores, a **written** explanation of the mistake, along with the exam, should be submitted to the professor within one week of the day the exam is returned to the students. No markings or other alterations

should be made on the exam itself. No work that has been filled out with a pencil or erasable pen, in whole or in part, is eligible for regrading. No work appearing on the reverse side (back page) of an exam paper is eligible for regrading. (Work that continues onto the back page of an exam will be *graded*, if appropriate markings are made to that effect, but **will not be** re-graded.) To ensure fair and equal treatment to all students, all changes in exam scores will be made only through this formal regrade process. The professor will not discuss exam-score changes in face-to-face meetings with students. If a mistake was made in the student's favor, please do not call this to the instructor's attention -- it only punishes the honest.

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.

ACADEMIC MISCONDUCT

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 a score of zero points on the tainted assignment**. In some cases, it may also include assessing a lower or failing grade for the course.

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"

USE OF COPYRIGHTED 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.

ATTENDANCE

The following statement is the Purdue policy on course attendance. In this course, attendance is required at the final exam, and highly, highly recommended for the midterm exams (recall a missed exam cannot be made up, so a score of zero will be entered). The policies written below apply only to those four meetings.

Students are expected to be present for every meeting of the classes in which they are enrolled. Only the instructor can excuse a student from a course requirement or responsibility. When conflicts or absences 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 absences when advance notification to an instructor is not possible, the student should contact the instructor as soon as possible by email, or by contacting the main office that offers the course. When the student is unable to make direct contact with the instructor and is unable to leave word with the instructor's department because of circumstances beyond the student's control, and in cases of bereavement, the student or the student's representative should contact the Office of the Dean of Students,

The link to the complete policy and implications can be found at <http://www.purdue.edu/odos/services/classabsence.php>

GRIEF ABSENCE POLICY FOR STUDENTS

Purdue University recognizes that a time of bereavement is very difficult for a student. The University therefore provides the following rights to students facing the loss of a family member through the Grief Absence Policy for Students (GAPS). GAPS Policy: Students will be excused for funeral leave and given the opportunity to earn equivalent credit and to demonstrate evidence of meeting the learning outcomes for missed assignments or assessments in the event of the death of a member of the student's family.

VIOLENT BEHAVIOR POLICY

Purdue University is committed to providing a safe and secure campus environment for members of the university community. Purdue strives to create an educational environment for students and a work environment for employees that promote educational and career goals. Violent Behavior impedes such goals. Therefore, Violent Behavior is prohibited in or on any University Facility or while participating in any university activity.

STUDENTS WITH DISABILITIES

Purdue University is required to respond to the needs of the students with disabilities as outlined in both the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990 through the provision of auxiliary aids and services that allow a student with a disability to fully access and participate in the programs, services, and activities at Purdue University.

If you have a disability that requires special academic accommodation, please make an appointment to speak with me to discuss any adjustments. It is the student's responsibility to notify the Disability Resource Center (<http://www.purdue.edu/drc>) of an impairment/condition that may require accommodations and/or classroom modifications. Students may present a "Letter of Accommodation" to me at any point in the semester, but It is important that we talk about this as early as possible in the semester.

EMERGENCIES

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 beyond the instructor's control. Relevant changes to this course will be

posted onto the course website or can be obtained by contacting the instructors or TAs via email or phone. You are expected to read your @purdue.edu email on a frequent basis.

NONDISCRIMINATION

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 prohibits discrimination against any member of the University community on the basis of race, religion, color, sex, age, national origin or ancestry, genetic information, marital status, parental status, sexual orientation, gender identity and expression, disability, or status as a veteran. The University will conduct its programs, services and activities consistent with applicable federal, state and local laws, regulations and orders and in conformance with the procedures and limitations as set forth in [Executive Memorandum No. D-1](#), which provides specific contractual rights and remedies. Any student who believes they have been discriminated against may visit www.purdue.edu/report-hate to submit a complaint to the Office of Institutional Equity. Information may be reported anonymously.

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.