



DEPARTMENT OF BIOCHEMISTRY

**BCHM 30700 – Biochemistry Syllabus
Spring 2019**

INSTRUCTOR:

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Course TAs

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COURSE OBJECTIVES

Students who enroll in BCHM 30700 have wide-ranging interests and aspire to pursue careers in biological or life science, medicine, nursing, veterinary medicine, animal science, dietetics, food science, botany, nutrition, and engineering. This course will provide students with the basic foundation of biochemistry concepts that will be required for the pursuit of their academic and career objectives. The first third of the course will use a structure-based approach to introduce students to central biomolecules including nucleic acids, proteins, carbohydrates, and lipids. As each biomolecule is described, its relevance and context will be demonstrated using real-world examples drawn from human health and agriculture. This part of the course will cover the molecular basis of protein structure and the catalytic activity of enzymes. During the second third of the course, the essential features of the central dogma will be described with an emphasis on the enzymes and macromolecules that are involved in replication, transcription and translation. The final third of the course will cover metabolic pathways and focus on the interconnection between glycolysis and the citric acid cycle and the production of chemical energy by the formation of proton gradients.

LEARNING OUTCOMES

Upon completion of BCHM 30700, students with a passing or above grade will be able to:

- Examine the structure/function relationship of biological macromolecules.
- Outline the central dogma of molecular biology.
- Describe intermediary carbon metabolism: glycolysis, the citric acid cycle, oxidative phosphorylation and photosynthesis.
- Analyze and evaluate case studies and articles that discuss the contributions of biochemistry to society, including improvements to medicine agriculture and the economy.

RECOMMENDED TEXTBOOK

Essential Biochemistry, Third Edition (or 4th Edition) by Pratt and Cornely. Published by John Wiley & Sons, Inc.

SUGGESTED VERSIONS	ISBN
Hardcover Text with WileyPLUS	9781118567883
Loose-leaf, binder-ready text with WileyPLUS	9781118567715
E-text with WileyPLUS	9781118567586

LECTURE TIME AND PLACE

Monday, Wednesday and Friday, 11:30 am – 12:20 pm in WALC 1018. All lectures will be recorded, and will be available for students who miss a class or who would like to review a lecture. They can be viewed through the “EchoCast” link on the Blackboard Learn page for this course. It should be noted that listening to EchoCasts should not be considered an equivalent learning experience to being in class, and opportunities for credit that are offered in class will not be offered to those who miss class.

Some of the lecture material will be provided to you as videos on Blackboard. You are asked to view these before certain classes, especially to make sure you are prepared for the Friday activity sessions.

BLACKBOARD

The syllabus for the course will be available via the Purdue University Blackboard Learn site at <https://mycourses.purdue.edu/>

COMPUTERS

You are encouraged to bring your laptop or tablet to class and actively follow the lecture through Biolercast. You will be able to annotate the presentation, and participate in in-lecture activities. Many class activities (Clinical Connections) will require the use of a laptop or tablet computer.

ASSESSMENTQuizzes

There are five quizzes that will each be held during the first 20 minutes of class. Each quiz is worth 25 points. One of your quiz grades will be dropped. Quizzes will be completed on Scantrons. Please fill out the Scantron form correctly to ensure you get credit for your quiz.

Examinations

There are three exams that will be given. Each in-semester exam is worth 100 points. The final exam is worth 150 points. Two of the exams will be given during the semester, and the last exam will be given during the final week. The date of the final exam will be announced when scheduled. Exams 1 and 2 are non-cumulative; Exam 3 (the final exam) is cumulative.

Missing an exam or quiz will result in a grade of zero being recorded unless documented justification for the absence is presented. If you know in advance that you will need to miss an exam or quiz due to participation in a university-sanctioned event, please request approval for the absence in advance of the exam date.

Any request to reschedule an exam or quiz must be emailed to Dr. Hart at least two weeks prior to the exam, and be accompanied by official documentation. Only in the case of documented illness or a death in your family is prior approval not required for missing an exam or quiz. Makeup quizzes/exams will be scheduled in consultation with the Dr. Hart and the TAs and will be a different format to the original quiz/exam (typically make-up exams are all long essay questions).

All exams and quizzes must be completed in ink to be eligible for re-grading. If you disagree with the grading of your quizzes or exams, please consult the course TA.

Requests for re-grading of a quiz or exam must be submitted no later than the end of the second class period after the graded test or assignment has been returned.

Please note that the Final Exam will be scheduled by Purdue to be held during Finals Week. There will be no rescheduling of the Final Exam for any reason except an emergency, for which documentation must be provided (ie, rescheduling for a vacation, interview, etc, is not permitted). Please plan accordingly.

Studying Abroad in Maymester?

Study Abroad is not an excused absence, and you are expected to fulfill your obligations to one course before making schedule-conflicting commitments to another course.

However, if you are leaving on Study Abroad for Maymester, and must leave before the scheduled final exam, there will be an alternate exam administered on the Monday of Finals Week at 11am. The time of this alternate exam is not flexible. The format of the exam will be long (1000-1500 word) essay questions.

Clinical Connections

These are team activities, which will be completed on Fridays in class. Clinical Connections are articles that detail practical applications of the topics we cover in regular lectures. They will be available for viewing on Blackboard. Each week that there is a Clinical Connection assignment, questions will be released in class that your team must answer and submit as an assignment. If you are not in class for the whole class period, you will not get credit for the assignment. Your TAs and Dr. Hart will be available to help you if necessary. Your lowest Clinical Connection Score will be dropped at the end of the semester.

Other in-class activities

There will be other for-credit in-class activities, both individual and team, administered, usually on Fridays. You must be present for the entire class period to be awarded credit.

Individual/Team Project

This project is called "Biochemistry in the Movies", and will ask you to analyze the presentation of biochemistry in a particular movie, tv show, or even a single tv episode. It is expected that you will not begin this project until halfway through the course. There will be an option to complete this project as either a team, or an individual. Detailed instructions will be provided on Blackboard, but you should note, your submission will include a short video that you make!

GRADING SCHEME

Exam 1	100 points
Exam 2	100 points
Exam 3 (Final)	150 points
Quizzes (x5 drop 1)	100 points
Clinical Connections (x11. Drop 1)	150 points
Media Project	50 points
Other in-class assignments	50 points

*Knowledge Assessment (x2)	16 points
**Replay/Quiz homework activities	7 points
***End of course survey	7 points

* These are Extra Credit tasks and you will be awarded points based on completing the assessment/survey.

**Replay is a way for you to practice your mastery of the content and earn XPs for doing so. You earn XPs based on mastery, but also time-on-task. Students within the top 50% of XPs will be awarded the extra credit. More information on this will be provided in an announcement on Blackboard Learn.

*** End of course survey extra points will be awarded to the entire class if at least 90% of the class completes the survey. If less than 80% of the class completes the survey, these extra points will not be awarded.

Total points 700

The cutoff values for letter grades are as follows:

630 points	A
560 points	B
490 points	C
420 points	D
419 points and below	F

EXTRA CREDIT

See above: "Grading Scheme".

OBTAINING EXTRA HELP

Office hours / Help sessions: Your TAs will be available to answer your questions immediately before or after class, or at office hours / Help sessions. Attendance at office hours hosted by any of the TAs is strongly encouraged. Historical data shows that students who attend office hours can expect to see their grade improve by an average of one letter.

Discussion forum: There is an active discussion forum on Blackboard. You are encouraged to ask all content-related questions on the forum, and answer other students' questions if you can. **Students who actively participate in the discussion forum will be eligible for up to 1% extra credit** (at Dr. Hart's discretion), if you are on a grade "bubble" at the end of the semester.

Other: You may reach out to your TAs or Dr. Hart with questions and concerns via email. Please look at the Communication etiquette document on Blackboard before communicating with your TAs or Dr. Hart.

CAPS Information: 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 and <http://www.purdue.edu/caps/> during and after hours, on weekends and holidays, or through its counselors physically located in the Purdue University Student Health Center (PUSH) during business hours.

The Disability Resource Center (DRC) is a valuable resource for students. Students may present a "Letter of Accommodation" to at any point in the semester, though earlier is always better. Should you have questions about accommodations, or if you would like to see if you could benefit from accommodations, please contact the DRC at: 494-1247 or drc@purdue.edu. If you know you have accommodations, please provide an electronic copy of your letter to Dr. Hart within the first two weeks of the semester.

ACADEMIC MISCONDUCT

(Please read this in its entirety to make sure you don't inadvertently engage in one of these activities. Ignorance of the policies will not be considered in judgment of academic dishonesty)

There will be a Zero-Tolerance policy for lack of personal integrity in this course. At a minimum, cheating will result in zero points for the assignment or exam in question. It's also possible that a student will fail the class as a result. It is always best to avoid the very appearance of cheating.

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

A first incident of academic misconduct will result in a minimum of two actions:

- **The incident 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.**
- **Zero points will be assigned as the grade for the exam, quiz, or assignment in question.**
- **If the first incident is considered significant enough (e.g. dishonesty on the final exam), the result may be an automatic F for the course.**

A second incident of academic misconduct, will result in the above actions, plus the following:

- **Dr. Hart will ask that the Office of the Dean of Students support her recommendation that the student be removed from the course.**

Dr. Hart has subscriptions to "study aid" websites such as Chegg, Course Hero, Cram, Quizlet, and more. If she determines that your assignment answers come from one of these websites, you have engaged in academic dishonesty, and you will be penalized accordingly. In addition, if it is determined that you share ANY course materials (questions and/or answers to questions) with any third party, including but not limited to friends, classmates, or a website, that is considered academic dishonesty, and you will be penalized accordingly. **If it is determined in a future semester that such academic dishonesty has occurred (for example, you share your materials with a friend who will take the course in a future semester), the penalties will be retroactively applied, and your course grade will be changed.**

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
- allowing someone access to your assignments for a course you took

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 (**please note that quoting material in scientific writing is rarely appropriate; paraphrasing is required**).
- 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"

CLASS ATTENDANCE

In accordance with University policy, you are expected to attend every scheduled class. If you have a valid reason for missing class such as a University-sponsored activity, religious observances, illness, or family emergency, the instructor or TA will assist you in obtaining information and materials you may have missed. Students who skip class without a valid excuse should not expect the instructor or TA to supply class notes or provide special help. For the official university policy, see: www.purdue.edu/odos/services/classabsence.php and http://www.purdue.edu/studentregulations/regulations_procedures/classes.html

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 Blackboard site or e-mail or phone the instructor.

ON-LINE COURSE EVALUATIONS

During the last week 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 eighth week of classes, you will receive an official email from evaluation administrators with a link to the online evaluation site. You will have one week 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. **If 80% of BCHM 309 students (combined from all sections) complete the end of course surveys, all students will receive 1% extra credit.**

NON-DISCRIMINATION POLICY STATEMENT

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.

ANTI-HARASSMENT POLICY STATEMENT

Harassment in the workplace or the educational environment is unacceptable conduct and will not be tolerated. Purdue University is committed to maintaining an educational and work climate for faculty, staff and students that is positive and free from all forms of Harassment. This policy addresses Harassment in all forms, including Harassment toward individuals with legally protected status for reasons of race, gender, religion, color, age, national origin or ancestry, genetic information or disability and Harassment toward individuals for other reasons such as sexual orientation, gender identity, gender expression, marital status or parental status.

LECTURE SCHEDULE*

Week	Topic	Date	Chapter	Notes / Daily in-class activity
1	Introduction to this class	Jan-7		Essential information on expectations, and how to be successful! Please bring your laptops.
	Introduction to Biochemistry	Jan-9	1	Team assignments (find your seat for the semester!)
	Introduction to Biochemistry	Jan-11	1	In-class activity
2	Aqueous Chemistry	Jan-14		
	Aqueous Chemistry	Jan-16	2	
		Jan-18	2	Clinical Connection 1: Acid-Base Balance in Humans
3	MLK Day	Jan-21	3	No Class
	From Genes to Proteins	Jan-23	3	
	From Genes to Proteins	Jan-25	3	Clinical Connection 2: Discovery of the Cystic Fibrosis Gene
4	Quiz 1 // Protein Structure	Jan-28	4	Quiz 1
	Protein Structure	Jan-30	4	
	Protein Structure	Feb-1	4	Clinical Connection 3: Protein Misfolding and Disease.
5	Protein Function	Feb-4	5	
	Protein Function	Feb-6	5	
	Protein Function	Feb-8	5	Clinical Connection 4: Genetic Collagen Diseases.
6	Quiz 2 // How Enzymes Work	Feb-11	6	Quiz 2
	How Enzymes Work	Feb-13	6	
	Enzyme kinetics and Inhibition	Feb-15	7	Clinical Connection 5: Blood Coagulation Requires a Cascade of Proteins.
7	Enzyme kinetics and Inhibition	Feb-18	7	
	Carbohydrates	Feb-20	11	
	Lipids and membranes	Feb-22	8	Clinical Connection 6: The Lipid Vitamins A, D, E and K
8	Exam 1	Feb-25		Exam 1
	DNA Replication & Repair	Feb-27	20	
	Exam 1 review	Mar-1		Exam 1 review
9	Transcription & RNA	Mar-4	21	
	Quiz 3 // Transcription & RNA	Mar-6	21	Quiz 3
	Protein Synthesis	Mar-8	22	Clinical Connection 7: Cancer is a Genetic Disease.
10	Spring Break	Mar-11-15		
11	Protein Synthesis	Mar-18	22	
	Tools and Techniques for Manipulating DNA	Mar-20	3	
		Mar-22		In-class activities.
12	Exam 2	Mar-25		Exam 2
	Metabolism & Bioenergetics	Mar-27	12	
	Exam 2 review	Mar-29		Exam 2 review

13	Glucose Metabolism	Apr-1	13	
	Glucose Metabolism	Apr-3	13	
		Apr-5	13	Clinical Connection 8: Alcohol Metabolism & Glycogen Storage Diseases.
14	Quiz 4	Apr-8		Quiz 4
	The Citric Acid Cycle	Apr-10		Guest Lecture: TBA
	The Citric Acid Cycle	Apr-12	14	Clinical Connection 9: Mutations in Citric Acid Cycle Enzymes.
15	Oxidative Phosphorylation	Apr-15	15	Guest Lecture: TBA
	Quiz 5 // Photosynthesis	Apr-17	16	Quiz 5
	Photosynthesis	Apr-19	16	Clinical Connection 10
16	Photosynthesis	Apr-22	16	Guest Lecture: TBA
	Clinical Connections Review	Apr-24		
	Final Exam Review	Apr-26		Student-Driven: Come prepared with questions!
	Final Exam	TBD		

*Schedule is subject to change, however Quiz and Exam dates will only be changed in the event of an emergency that requires class to be cancelled.