



DEPARTMENT OF BIOCHEMISTRY

**BCHM 30700 – Biochemistry Syllabus
Fall 2021**

INSTRUCTOR:

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This is a fully online course, which can be taken remotely, as long as you have the required resources. You should consider if online learning is right for you, and speak with your advisor if necessary, before enrolling in this course. It will require a lot of discipline, organization, time management, and collaboration with people at other remote locations (and time zones!). PLEASE NOTE THAT A WIRED INTERNET CONNECTION (using an Ethernet cable) WITH HIGH PERFORMANCE UPLOAD AND DOWNLOAD SPEEDS WILL BE MORE RELIABLE THAN WIFI. You may not be able to take this course using computers available on campus (eg, in the library).

COURSE SUMMARY

Students who enroll in BCHM 30700 have wide-ranging interests and aspire to pursue careers in biological or life sciences and engineering, medicine, veterinary medicine, animal science, dietetics, food science, botany and nutrition. 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.
- Evaluate case studies and articles that discuss the contributions of biochemistry to society, including improvements to medicine agriculture and the economy.

TEXTBOOK

Essential Biochemistry, 5th Edition, by Pratt and Cornely. Published by John Wiley & Sons, Inc. Access to WileyPLUS online is strongly recommended, but not required. Practice problems may be referenced in the text, and you may be directed to the text for resources. For these reasons, the textbook is strongly recommended by this instructor. If you choose to use a previous edition or an alternate textbook, you are responsible for identifying equivalent reading material and you may not have access to suggested practice problems.

SUGGESTED VERSIONS	ISBN
Loose-leaf, binder-ready text with WileyPLUS	ISBN: 978-1-119-71320-3
E-text with WileyPLUS	ISBN: 978-1-119-71285-5

If you don't wish to purchase a textbook, there is a copy of the 4th edition of this textbook on reserve in the Purdue libraries.

In addition, there is a publicly available textbook on-line at:

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

Again, should you chose this option, you are responsible for identifying the appropriate reading material for the week.

In addition, YouTube is a great resource for videos on the material covered in this course. Some of these will be posted in each week's content. If you find one that is particularly helpful, please send it to Professor Golden or post it in the discussion section.

BRIGHTSPACE

The syllabus for the course, along with all content and links to additional resources, required software, and assessments, will be available via the Purdue University Brightspace site at <https://purdue.brightspace.com>

COMPUTERS

A reliable computer or laptop that is equipped with a webcam is required in order to take this course. A tablet such as an ipad will not be sufficient. If your computer does not have a built-in webcam, you will need to purchase one that can be used with your computer. Usually you cannot install software or hardware on a shared computer (such as in the computer labs on campus, or in a library), so it is assumed that you have your own computer for this course. Course deadlines may not be extended for computer breakdowns or crashes. Therefore, make sure you back up your work remotely if necessary to avoid losing work when a computer breaks down.

If you cannot take assessments by their due dates because of lack of access to a computer, software, internet access, or webcam, you may forfeit the points for that assessment. There are system requirements for running the software that is needed. If your system cannot download, install, or run the Lockdown Browser, you may not able to take any course assessments. Neither your instructor, nor your TAs, will be able to troubleshoot any computer issues for you, however, you may contact ITaP, or the Academic Success Center for help.

INTERNET ACCESS

You will need regular wired access to high-quality internet that will allow you to stream content in both directions. Poor connectivity will not be accepted as an excuse for not reviewing content, missing assessment deadlines, or browser or system crashes on your end.

The consequences of low download speed will be disruptions to streaming the video content, and accessing other materials. The consequences for low upload speed may be inability to participate in live help sessions, or video meetings with your instructor or TAs. There are multiple platforms you can use to check your connection speed. A consistent minimum (not average) speed of 20 Mbps download and 5 Mbps upload speed is required. This is assuming your network is unshared, and your router can handle the data. Neither your instructor, nor your TAs, will be able to troubleshoot any internet connectivity issues for you.

TIPS: 1. Run a **speedtest** on your computer: <http://beta.speedtest.net/>

2. **Malware** can build up and bog down internet processing, and even though the connection speed is high quality, the internet may be extremely slow. It is recommended that you use some type of malware checker/remover/cleaner.

3. Make sure there are not **high demands on your bandwidth** while you are taking an assessment. If your roommates are playing online videos games, streaming movies etc, that will impact the bandwidth available to you, and may cause your assessment to fail.

If you have a major technology failure that prevents you from completing your work on time, contact Professor Golden.

LECTURES

Lectures will be delivered online through Brightspace. They are divided into weekly content areas to help you keep the material organized. There is no set time that you are required to be online, however, it is strongly recommended that you create a schedule for watching the lectures. There is no limit to how many times you can view a lecture video or any other content.

ASSESSMENT

Quizzes

There are weekly quizzes during the course, which you will take through Brightspace. These quizzes must be completed by the end of the day on Sunday. The purpose of these quizzes is to provide feedback on how well you understood the material for the week and to provide incentive to keep up with the material ahead of each exam. Quizzes will be posted by the end of the day Thursday each week.

Once you begin the quiz, you must complete it; you cannot stop and start. These will be open book quizzes and will, in general, be **timed**. This may change if there is evidence of academic dishonesty or there are class needs that require a pivot in the format of the weekly quizzes.

Each quiz will be worth 10 points.

Exercises

There will be up to one additional exercise per week. These will be open book and will not be timed. They provide 1-5 points of extra credit. Since these are extra credit, there will be no extensions granted for exercises.

Examinations

There are four exams that will be given. Each in-semester exam is worth 200 points. The final exam is worth 200 points. Three of the exams will be given during the semester, and the last

exam will be given during the final week. All exams during the semester are non-cumulative. The final exam is cumulative. The exam with the lowest score will be dropped from your grade calculation. If you have performed well on the first three exams, you can skip the final exam and your grade will be calculated using the three in-semester exams.

You will have at least a 48-hour window within which they must be completed. **These are closed-book/resource, timed exams.** You must make sure you are familiar with plagiarism and academic honesty rules when you complete these exams. Ask questions prior to the exams if you are uncertain about how to complete them. Any violations of academic integrity will be investigated and penalized.

Missing an exam or quiz will result in a grade of zero being recorded unless documented justification for the absence is presented. You will have at least a 48 hour-window to complete all assessments, therefore, no rescheduling of quizzes or exams will be permitted. Poor internet connection, falling asleep before the submission deadline, etc., will not be accepted as a reason for missing assessments.

Note that the deadline for each assessment is when the assessment closes. Do not start an assessment a few minutes before the deadline ends. All assessments for this course must be completed by 11:59 PM (before midnight) of the due date. The dreaded 11:59's I know, but it is the best way to minimize confusion about when an assignment is due and it also eliminates class to class variation about what hour assignments are due.

Requests for re-grading of a quiz or exam must be submitted within a week of the assessment grade being made available to you.

Please note that the Final Exam will be scheduled by Purdue to be held during Finals week (or the three days following the end of classes). 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, or Study Abroad is not permitted). Please plan accordingly. Purdue will notify us if you have multiple examinations scheduled on a single day. Should you choose to take the final and should you be in this circumstance, contact Dr. Golden if you need to reschedule.

GRADING SCHEME

Exam 1	200 points
Exam 2	200 points
Exam 3	200 points
Final Exam	200 points
Lowest exam score dropped-	600 points
	<i>total for exams</i>
Syllabus quiz	5 points
Quizzes	150 points
*End of course survey	2 points
Total points	755

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

The cutoff values for letter grades are as follows:

680 points (90%)	A
604 points (80%)	B
529 points (70%)	C
453 points (60%)	D
452 points and below	F

There is no plus/minus grading for this course. If you have accumulated sufficient points to earn a given grade, you will receive that grade. The instructor does reserve the right to use plus/minus grading for students at the borderline of a grade cutoff (ie, a B+ or A- for those who score close to 90%). Plus/minus grading will not be used to reduce your grade (ie, an A- if you earn 680 points).

OBTAINING EXTRA HELP

Your TAs will communicate with you via the discussion boards, and can be contacted via email if you have additional questions. Additional resources, including online help sessions, will be offered if needed prior to exams. Dr. Golden will be available to answer questions on the discussion boards or via email. **Please note: any content-related questions should be asked on the discussion boards.**

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

Dr. Golden 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, or that you have used these websites inappropriately in completing any coursework, 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, or upload materials to a website), 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 another student to access your work for a course you have already taken

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"

CLASS ATTENDANCE

In accordance with University policy, you are expected to attend every scheduled class. In an online class, this means you are responsible for ensuring you schedule adequate time for viewing and studying the course materials. For the official university policy, see:

www.purdue.edu/odos/services/classabsence.php and
http://www.purdue.edu/studentregulations/regulations_procedures/classes.html

This is an on-line course with no face-to-face interactions. If you are sick Purdue's policy is below.

Attendance Policy during COVID-19: Students should stay home and contact the Protect Purdue Health Center (496-INFO) if they feel ill, have any symptoms associated with COVID-19, or suspect they have been exposed to the virus. In the current context of COVID-19, in-person attendance will not be a factor in the final grades, but the student still needs to inform the instructor of any conflict that can be anticipated and will affect the submission of an assignment or the ability to take an exam. 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 conflict, when advance notification to an instructor is not possible, the student should contact the instructor as soon as possible by email, through Brightspace. 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, 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 on Attendance and Grief Absence policies under the University Policies menu.

If you become quarantined or isolated at any point in time during the semester, in addition to support from the Protect Purdue Health Center, you will also have access to an Academic Case Manager who can provide you academic support during this time. Your Academic Case Manager can be reached at acmq@purdue.edu and will 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. 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. The Office of the Dean of Students (odos@purdue.edu) is also available to support you should this situation occur.

Anyone seeking an extension for COVID-19 related illness must have a formal notice of requirement to quarantine/isolate from the Office of the Dean of Students.

PROTECT PURDUE PLAN

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, wearing a mask in classrooms and campus buildings, at all times (e.g., no eating/drinking in the classroom), disinfecting desk/workspace prior to and after use, maintaining proper 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 wearing a mask) may leave the room without consequence. The student is encouraged to report the behavior to and discuss 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.

BASIC NEEDS SECURITY

Any student who faces challenges securing their food or housing and believes this may affect their performance in the course is urged to contact the Dean of Students for support. There is no appointment needed and Student Support Services is available to serve students 8 a.m.-5 p.m. Monday through Friday. Considering the significant disruptions caused by the current global crisis as it related to COVID-19, students may submit requests for emergency assistance from the [Critical Needs Fund](#)

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 the instructor. This may include transition to a virtual campus due to COVID-19.

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.

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.

TENTATIVE SCHEDULE*

This course will be organized on a week-by-week basis. Each week's reading material, notes, assignments, and quizzes will be available on Brightspace. The course is organized into three modules, and each exam during the semester will cover the content of a single module. The final exam is cumulative and covers the content of all three modules.

*Schedule is subject to change. Exam and Quiz dates will not be changed, except in the event of an emergency on campus.

Week	Topic	Chapter	Assignments Due (see Brightspace for due dates)
1-Aug 23	Introduction to Biochemistry	1	Syllabus quiz, quiz
1	Aqueous Chemistry	2	
2-August 30	From Genes to Proteins	3	quiz
3-Sept 6 Labor Day Holiday	Protein structure, protein function	4-5	quiz
4-Sept 13	Protein function,	5-6	quiz
4	How Enzymes Work	6	
4-5	Enzyme kinetics and Inhibition	7	
5-Sept 20	Carbohydrates	11	quiz
5	Lipids and membranes	8	
6-Sept 27	Exam 1 (Module 1 content)		Exam 1: October 1-2
6	DNA Replication & Repair	20	quiz
7- Oct 4	Transcription & RNA	21	quiz
8- Oct 11 Fall Break	Protein Synthesis	22	quiz
9- Oct 18	Viral Replication and reverse transcription		quiz
10-Oct 25	RNA processes in the cell		quiz
11	Exam 2 (Module 2 content)		Exam 2: November 5-6
11- Nov 1	Metabolism & Bioenergetics	12	quiz
12- Nov 8	Glucose Metabolism	13	quiz
12	The Citric Acid Cycle	14	
13 Nov 15	Oxidative Phosphorylation, Photosynthesis	15, 16	quiz
14- Nov 22	Thanksgiving		
15-November 29	Oxidative Phosphorylation, Photosynthesis		quiz
15- November 29	Exam 3 (Module 3 content)		Exam3:
16-December 6	Review for Final Exam		
	FINAL EXAM (cumulative)		FINAL EXAM: will be scheduled by Purd

