INSTRUCTOR:
Dr. Golden
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Course TAs: Pallavi Joshi Huijia Gong Jupa Juaregui
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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 WILL NOT BE ABLE TO TAKE THIS COURSE USING ONE OF THE CAMPUS-OWNED COMPUTERS (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, 4th Edition, by Pratt and Cornely. Published by John Wiley & Sons, Inc. Access to WileyPLUS online is strongly recommended. Practice problems may be referenced in the text, and you may be directed to the text for resources.

SUGGESTED VERSIONS

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<th>ISBN</th>
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<tr>
<td>Hardcover Text with WileyPLUS</td>
<td>978-1118567883</td>
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<tr>
<td>Loose-leaf, binder-ready text with WileyPLUS</td>
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<td>E-text with WileyPLUS</td>
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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 will not be extended for computer breakdowns or crashes. 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 be 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 will 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.

**LECTURES**

Lectures will be delivered online through Brightspace. They are divided into 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 two weekly quizzes during the course, which you will take through Brightspace. You will have a 48-hour period within which you must complete the quiz. Once you begin the quiz, you must complete it; you cannot stop and start. These are intended to be closed-book quizzes and will, in general, be **timed**. After the first week, the pre-quiz will be used to assess your understanding of the reading material and will be available on Monday and Tuesday. Each pre-quiz is worth 5 points towards your total grade. The post-quiz will be used to assess your mastery of the week’s material and will be available Thursday through Sunday. Each post-quiz is worth 10 points towards your final grade.

**Examinations**

There are four exams that will be given. Each in-semester exam is worth 100 points. The final exam is worth 100 points. Three 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. 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 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.

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). Given that this is an online class, if there is a unanimous call by the class to change the day of the Final, Dr. Golden will allow it. 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.
GRADING SCHEME

Exam 1 200 points
Exam 2 200 points
Exam 3 200 points
Final Exam 200 points
Lowest exam score dropped- 600 points
  total for exams
Quizzes-Module start 70 points
Quizzes-Module end 140 points

*End of course survey 6 points

Total points 810

* 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:

- 729 points  A
- 648 points  B
- 567 points  C
- 486 points  D
- 485 points and below  F

**OBTAINING EXTRA HELP**

Your TAs (Pallavi, Huijia, and Jupa) 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](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.

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/leaving 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.
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.
<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Chapter</th>
<th>Assignments Due (see Brightspace for due dates)</th>
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<tbody>
<tr>
<td>1</td>
<td>Introduction to Biochemistry</td>
<td>1</td>
<td>Scavenger Hunt Pre-quiz, Post-quiz</td>
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<td>1</td>
<td>Aqueous Chemistry</td>
<td>2</td>
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<td>2</td>
<td>From Genes to Proteins</td>
<td>3</td>
<td>Pre-quiz, post-quiz</td>
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<tr>
<td>3</td>
<td>Protein structure, protein function</td>
<td>4-5</td>
<td>Pre-quiz, post-quiz</td>
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<tr>
<td>4</td>
<td>Protein function</td>
<td>5-6</td>
<td>Pre-quiz, post-quiz</td>
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<tr>
<td>4-5</td>
<td>How Enzymes Work</td>
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<tr>
<td>5</td>
<td>Enzyme kinetics and Inhibition</td>
<td>7</td>
<td>Pre-quiz, post-quiz</td>
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<tr>
<td>5</td>
<td>Carbohydrates</td>
<td>11</td>
<td>Pre-quiz, post-quiz</td>
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<td>5</td>
<td>Lipids and membranes</td>
<td>8</td>
<td></td>
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<tr>
<td>6</td>
<td><strong>Exam 1 (Module 1 content)</strong></td>
<td></td>
<td><strong>Exam 1: Mon-Tue September 28-29</strong></td>
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<tr>
<td>6</td>
<td>DNA Replication &amp; Repair</td>
<td>20</td>
<td>Pre-quiz, post-quiz</td>
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<tr>
<td>7</td>
<td>Transcription &amp; RNA</td>
<td>21</td>
<td>Pre-quiz, post-quiz</td>
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<td>8</td>
<td>Protein Synthesis</td>
<td>22</td>
<td>Pre-quiz, post-quiz</td>
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<td>9</td>
<td>Viral Replication and reverse transcription</td>
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<td>Pre-quiz, post-quiz</td>
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<td>10</td>
<td>RNA processes in the cell</td>
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<td>Pre-quiz, post-quiz</td>
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<tr>
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<td><strong>Exam 2 (Module 2 content)</strong></td>
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<td><strong>Exam 2: Thur-Fri November 2-3</strong></td>
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<td>11</td>
<td>Metabolism &amp; Bioenergetics</td>
<td>12</td>
<td>Pre-quiz, post-quiz</td>
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<tr>
<td>12</td>
<td>Glucose Metabolism</td>
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<td>Pre-quiz, post-quiz</td>
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<tr>
<td>12</td>
<td>The Citric Acid Cycle</td>
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<tr>
<td>13</td>
<td>Oxidative Phosphorylation, Photosynthesis</td>
<td>15, 16</td>
<td>Pre-quiz, post-quiz</td>
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<tr>
<td>13</td>
<td><strong>Exam 3 (Module 3 content)</strong></td>
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<td><strong>Exam3: Thurs-Fri November 19-20</strong></td>
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<tr>
<td>14</td>
<td>Thanksgiving week</td>
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<tr>
<td>15</td>
<td>Review for Final Exam</td>
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<td><strong>FINAL EXAM (cumulative)</strong></td>
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<td><strong>FINAL EXAM: TBD</strong></td>
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*Schedule is subject to change. Exam and Quiz dates will not be changed, except in the event of an emergency on campus.

This assignment schedule is not comprehensive. There will be other assignments given as needed to help you practice and gain mastery of the content, the details of which can be found on Brightspace. Please contact your TA if you have any questions about assignments or due dates.