DEPARTMENT OF BIOCHEMISTRY

BCHM 30700 – Biochemistry Syllabus
Spring 2017

INSTRUCTOR: Tiffany Young
office: BCHM 116
e-mail: young93@purdue.edu
Office hours: Monday 12:30-1:30pm or by appointment

Course TAs
Samantha Lee  Corey Moore
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Office Hours TBD  TBD

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 have an understanding of the following content areas:

• structure/function of amino acids, carbohydrates, lipids and nucleic acids
• protein structure, function and purification
• basic enzymology
• replication, transcription and translation
• intermediary metabolism including:
  o glycolysis
  o the citric acid cycle
  o oxidative phosphorylation
• photosynthesis

BCHM 30700 students will also develop an appreciation for some of the contributions that have been made by biochemistry to society, including improvements to medicine, agriculture, and the economy.

RECOMMENDED TEXTBOOK
Essential Biochemistry, Third 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 SMTH 108. 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 downloaded from the “BoilerCast” 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.

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 Echo. You will be able to annotate the presentation, and participate in in-lecture activities. Many lecture activities (Biochemistry Applications) will require the use of a laptop or tablet computer.

ASSESSMENT
Quizzes
There are five quizzes that will each be held during the first 20 minutes of class. Each quiz is worth 20 points.

Examinations
There are three exams that will be given. Each exam is worth 100 points. Two of the exams will be given in class during the semester, and the last exam will be given during Finals Week. The date of the final exam will be announced when scheduled. Exam 2 is for the most part non-cumulative. However, questions may require applying material covered in Exam 1 to current material, but questions that directly test your knowledge of material included in Exam 1 will not be given. This will be discussed more prior to Exam 2. 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 the instructor 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 instructor and the TAs and will be a different format to the original quiz/exam (typically make-up exams are all 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.

**GRADING SCHEME**

- Exam 1 100 points
- Exam 2 100 points
- Exam 3 (Final) 100 points
- Quizzes 100 points

Total points 400

The cutoff values for letter grades are as follows:

- 360 points A
- 320 points B
- 280 points C
- 240 points D
- 239 points and below F

**EXTRA CREDIT**

1. See below: “OBTAINING EXTRA HELP”.
2. In-class activities, “Biochemistry Applications”, must be completed in class, in groups. Students in groups that reasonably complete each assignment will be awarded 2 points (0.5% of course grade) per assignment. These assignments will not necessarily be announced ahead of time. At least six of these assignments will be given throughout the semester for a maximum of 10 points. This means that you may miss one in-class activity and not lose potential extra points. More in-class activities may be assigned at the instructor’s discretion, which will increase the total possible points that can be earned by 2 per extra assignment. Laptops or tablets are required for completing these assignments. Students must also be present in class to participate. It will be considered academic misconduct if an absent student’s name is listed on a group assignment and the entire group will be given a zero for that assignment. Actions may also be taken in accordance to the academic misconduct policy provided in the syllabus. As these are extra credit, in-class activities, makeup assignments will not be given under any circumstances.
3. See “Online Course Evaluations”.

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3. See “Online Course Evaluations”.
OBTAINING EXTRA HELP

Office hours: Your TAs (Sam and Corey) will be available to answer your questions immediately before or after class, or at office hours. 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.

Other: You may reach out to your TAs or the instructor with questions and concerns via email.

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 result in 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 test or quiz.

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 (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 307 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*

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Date</th>
<th>Chapter</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction to this class and ALP/Introduction to Biochemistry</td>
<td>9-Jan</td>
<td></td>
<td>Essential information on expectations. Please bring a laptop or tablet to class for ALP tutorial.</td>
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<tr>
<td></td>
<td>Introduction to Biochemistry</td>
<td>11-Jan</td>
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<td>Introduction to Biochemistry</td>
<td>13-Jan</td>
<td>1</td>
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<td>2</td>
<td>MLK Jr. Day</td>
<td>16-Jan</td>
<td>No Class</td>
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<td>Aqueous Chemistry</td>
<td>18-Jan</td>
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<td>Aqueous Chemistry</td>
<td>20-Jan</td>
<td>2</td>
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<td>3</td>
<td>From Genes to Proteins</td>
<td>23-Jan</td>
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<td>From Genes to Proteins</td>
<td>25-Jan</td>
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<td>From Genes to Proteins</td>
<td>27-Jan</td>
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<tr>
<td>4</td>
<td>Quiz 1 // Protein Structure</td>
<td>30-Jan</td>
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<td>Protein Structure</td>
<td>1-Feb</td>
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<td>Protein Structure</td>
<td>3-Feb</td>
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<td>5</td>
<td>Protein Function</td>
<td>6-Feb</td>
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<td>Protein Function</td>
<td>8-Feb</td>
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<td>Protein Function</td>
<td>10-Feb</td>
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<tr>
<td>6</td>
<td>Quiz 2 // How Enzymes Work</td>
<td>13-Feb</td>
<td>6</td>
<td>Quiz 2</td>
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<td>How Enzymes Work</td>
<td>15-Feb</td>
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<td>Enzyme kinetics and Inhibition</td>
<td>17-Feb</td>
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<td>Enzyme kinetics and Inhibition</td>
<td>20-Feb</td>
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<td>Carbohydrates</td>
<td>22-Feb</td>
<td>11</td>
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<td>Lipids and membranes</td>
<td>24-Feb</td>
<td>8</td>
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<td>No</td>
<td>Topic</td>
<td>Dates</td>
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<td>8</td>
<td>Lipids and membranes</td>
<td>27-Feb 8</td>
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<td><strong>Exam 1</strong></td>
<td>1-Mar</td>
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<td>DNA Replication &amp; Repair</td>
<td>3-Mar 20</td>
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<td><strong>Exam 1 review // DNA Replication &amp; Repair</strong></td>
<td>6-Mar 20</td>
<td>20</td>
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<td>9</td>
<td>Transcription &amp; RNA</td>
<td>8-Mar 21</td>
<td>21</td>
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<td><strong>Quiz 3 // Transcription &amp; RNA</strong></td>
<td>10-Mar 21</td>
<td>21</td>
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<td><strong>Spring Break Mar-13-17</strong></td>
<td>20-Mar 22</td>
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<td><strong>Tools and Techniques for Manipulating DNA</strong></td>
<td>24-Mar 3</td>
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<tr>
<td>10</td>
<td><strong>Exam 2</strong></td>
<td>29-Mar 12</td>
<td>12</td>
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<td></td>
<td>Metabolism &amp; Bioenergetics</td>
<td>31-Mar 12</td>
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<tr>
<td>11</td>
<td>Protein Synthesis</td>
<td>20-Mar 22</td>
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<td>Protein Synthesis</td>
<td>22-Mar 22</td>
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<td><strong>Tools and Techniques for Manipulating DNA</strong></td>
<td>27-Mar 3</td>
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<tr>
<td>12</td>
<td><strong>Exam 2 review // Bioenergetics</strong></td>
<td>3-Apr 12</td>
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<td>Glucose Metabolism</td>
<td>5-Apr 13</td>
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<td>Glucose Metabolism</td>
<td>7-Apr 13</td>
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<td><strong>Quiz 4 // Citric Acid Cycle</strong></td>
<td>12-Apr 14</td>
<td>14</td>
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<td>The Citric Acid Cycle</td>
<td>15-Apr 14</td>
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<td>14</td>
<td><strong>Quiz 5 // Oxidative Phosphorylation</strong></td>
<td>17-Apr 15</td>
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<td>Oxidative Phosphorylation</td>
<td>19-Apr 15</td>
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<td>15</td>
<td>Photosynthesis</td>
<td>21-Apr 16</td>
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<td>24-Apr 16</td>
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<td><strong>Final Exam Review</strong></td>
<td>26-Apr 16</td>
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<td><strong>Final Exam</strong></td>
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*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.*