General Biochemistry I

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Course Number: 4375/5475
Credit Hours: 3.0
Prerequisites or Coreq.: Biology 3096 (W204), Chemistry 2202 (0122) and Math 1041 (C085) with a C- or better in all

Description: Biochemistry is a field of science that closely studies the connections between the structure of biological molecules and their function in the organisms. Students will learn how to identify the most relevant structural characteristics of biological molecules, how these play a role on a given function of the molecule, how biological systems follow the laws of thermodynamics and how these laws could explain the processes of protein folding, enzymatic activity, and metabolism.

General Principles and topics: thermodynamics applied to biochemistry, properties of water (pH and buffers); chemistry of amino acids and proteins including non-covalent interactions, proteins folding and denaturation; carbohydrates, nucleotides and nucleic acids; lipids and membranes; membrane channels and transport of molecules; enzyme mechanisms and kinetics; control of enzyme activity; bioenergetics and oxidative metabolism.

Goals: to provide students with a wide range of concepts in Biochemistry; by the end of the course the students will be able to:
• Connect the structure of molecules and their functions in the cell.
• Understand the complexity of oxygen transport in the organisms
• Apply basic concepts of protein and enzyme structure and function
• Identify structures of lipids and understand their biochemical roles.
• Identify structures of carboxylic acids and understand their biochemical roles
• Identify structures of nucleic acids and understand their biochemical roles
• Apply chemical concepts involved in both anabolic and catabolic pathways
• Apply the law of thermodynamics to understand protein folding, enzymatic activity, and metabolism.

TEMPLE AND COVID-19: Temple University’s motto is Perseverance Conquers, and we will meet the challenges of the COVID pandemic with flexibility and
resilience. The university has made plans for multiple eventualities. Working together as a community to deliver a meaningful learning experience is a responsibility we all share: we’re in this together so we can be together.

How This Course will be taught:
Class is scheduled to meet synchronously online MWF 11:00 am to 11:50 am. However, we will be following a schedule in which we will meet for synchronous classes only on Wednesdays and Friday at the scheduled time. We will not meet on Mondays. You will be assigned online work to make up for the Monday class. A tentative weekly schedule will look like this:

Monday/Tuesday (but opened on the previous Friday evening)
- Watch the asynchronous recordings, complete the assignments, and take the quizzes.
- Discussion Board (open from Monday to Friday)

Wednesday
- Synchronous class meeting from 11:00-11:50am
- Assigned homework due Friday

Friday
- Synchronous class meeting from 11:00-11:50am
- Assigned homework due Monday

Attendance Protocol and Your Health: If you feel unwell, you should not come to campus, and you will not be penalized for your absence. Instructors are required to ensure that attendance is recorded for each in-person or synchronous class session. The primary reason for documentation of attendance is to facilitate contact tracing, so that if a student or instructor with whom you have had close contact tests positive for COVID-19, the university can contact you. Recording of attendance will also provide an opportunity for outreach from student services and/or academic support units to support students should they become ill. Faculty and students agree to act in good faith and work with mutual flexibility. The expectation is that students will be honest in representing class attendance.

Student Support Services.
The following academic support services are available to support you:
Student Success Center
University Libraries
Undergraduate Research Support
Career Center
Tuttleman Counseling Services
Disability Resources and Services
If you are experiencing food insecurity or financial struggles, Temple provides resources and support. Notably, the Temple University Cherry Pantry and the
**Temple University Emergency Student Aid Program** are in operation as well as a variety of resources from the **Office of Student Affairs**.

**Textbook:** Appling/Anthony-Cahill/Mathews. Biochemistry: Concepts and Connections. Pearson 2nd Ed. Older edition of the same text or other textbooks may be also used.

**Course information:** this course will be offered online. In order to maximize the learning experience for students, I redesigned the course such that it will run asynchronous (pre-recorded) and synchronous lectures. The asynchronous lectures are essential for the work that will be done during the synchronous meeting and other activities so they must be completed first. It is very important that students attend all the synchronous lectures and carefully read the assigned chapters and sections before those lectures.

Asynchronous lectures will present the facts that we are studying, students have to watch the lecture (usually divided into three parts or files of about 10-15 minutes each; or stop the lecture when they need a break) and read the assigned pages in the textbook. After these the student will take a short quiz (see grading). We will spend the remaining two lectures of each week for synchronous online classes and in asynchronous discussions. The classes will be run through **Zoom** and will require your active participation.

**Technology specifications for this course:** students will need an up-to-date computer or tablet and a stable internet connection in order to complete the course. Limited resources are available for students who do not have the technology they need for class. Students with educational technology needs, including no computer or camera or insufficient Wifi-access, should submit a request outlining their needs using the Student Emergency Aid Fund form. The University will endeavor to meet needs, such as with a long-term loan of a laptop or Wifi-device, a refurbished computer, or subsidized internet access.

**How you will be tested:** exams, homework and quizzes will be conducted on Canvas. They will all be open-book with notes. Please note that while it will be possible to look at the notes and the book, you cannot expect to answer all the questions in this way: a rigorous knowledge of the material will still be necessary to answer all the questions. Searching the Web for answers or asking a colleague for help is not acceptable. Students will be asked to read and sign a code of conduct for all assessments.
Grading:
I. **All the quizzes after the asynchronous lectures will be worth 10% of your final grade.** Please note we will have ~35 lectures thus each quiz will be 0.6% of your final grade.

II. **Your presence at each scheduled synchronous class is highly encouraged. A total of 10% of your grade will come from the active participation.**

III. Each week there will be one or more discussion boards where students should discuss the material we have studied that week and commenting/questioning/connecting the information presented and/or proposing real life applications of the material presented. **This will be worth 5% of your grade.**

IV. After the synchronous lecture there will be assessments in the format of homework or weekly quizzes. **These will be worth 5% of your final grade.**

V. There will be four mid-term exams. **Each exam will be worth 10% of your final grade (40% total).** Exams may include short answer, essay, and multiple-choice questions.

VI. **20% of the final grade is earned by a completion of a Case study completed by a team of 4-5 students.** This will be done by uploading on Canvas a presentation in a format will be decided later.

VII. **The final exam under format of a cumulative test will be worth 10%**

Review of grading:
- i. Quiz after asynchronous lectures and reading: 10%
- ii. Active participation in synchronous classes: 10%
- iii. Active participation to discussion boards: 5%
- iv. Homework after synchronous lectures and reading: 5%
- v. Four mid-term exams: 4 x 10%
- vi. Case Study: 20%
- vii. Final exam: 10%

If a student misses a test, he/she will receive 0 points. Missed exams will not be re-administered except for the in-class exams missed for emergency situations or illness, of which the instructor must be notified no later than 24 hours after the exam. For the on-line material students will receive an automatic 10% deduction per day for each day they are late for the completion of the assignment, if not reasonable justifications are provided.

Final grades will be rounded to the nearest whole number.
A range = 93% or above
A- range = 90 – 92%
B+ range = 87% - 89%
B range = 83% - 86%
B- range = 80% - 82%
C+ range = 76%- 79%
C range = 65%-75%
C- range = 60% - 64%
D+ range = 55% - 59%
D range = 50% - 54%
D- range = 45%- 49%
F range = 44% or below

**Academic dishonesty:** the University has a policy on Student and Faculty and Academic Rights and Responsibilities (Policy #03.70.02), which can be accessed through the following link:
http://policies.temple.edu/getdoc.asp?policy_no=03.70.02
This includes Temple University's rules on plagiarism and cheating and general academic dishonesty.

Any recordings permitted in this class can only be used for the student’s personal educational use. Students are not permitted to copy, publish, or redistribute audio or video recordings of any portion of the class session to individuals who are not students in the course or academic program without the express permission of the faculty member and of any students who are recorded. Distribution without permission may be a violation of educational privacy law, known as FERPA as well as certain copyright laws. Any recordings made by the instructor or university of this course are the property of Temple University.

**Students with disabilities:** any student who has a need for accommodations based on the impact of a documented disability or medical condition should contact Disability Resources and Services (DRS) in 100 Ritter Annex (drs@temple.edu; 215-204-1280) to request accommodations and learn more about the resources available to you. If you have a DRS accommodation letter to share with me, or you would like to discuss your accommodations, please contact me as soon as practical. I will work with you and with DRS to coordinate reasonable accommodations for all students with documented disabilities. All discussions related to your accommodations will be confidential.

**Academic freedom:** freedom to teach and freedom to learn are inseparable facets of academic freedom. The University has a policy on Student and Faculty Academic Rights and Responsibilities (Policy #03.70.02) which can be accessed at policies.temple.edu.

**Graduate Students:** during the course they will receive primary literature material to read and will be expected to answer additional questions on exams and complete a review based on research papers related to the course topics.
Additional test requirements for graduate students will count for 25% of their final grade, while the basic course exam will count for the other 75%.

**Changes to this syllabus:** the information contained in this syllabus, other than the grade and missed-exam policies, may be subject to change with reasonable advance notice, as deemed necessary and appropriate by the instructor.