Biological Chemistry II - CHEM 4342 Syllabus

Instructor and class information

Instructor: Sambuddha Banerjee, Ph. D.

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Office: STEM 311Y

Class Hours: MWF (2.00-2.50 pm)

Class location: STEM 165

Office Hours: Tuesday 10.30am-12.30 pm, Thursday 3.00-5.00 pm (Book an appointment using your Outlook calendar. Use this YouTube tutorial to learn how to book office hours using Outlook)

Required Course Materials

Textbook**:** Principles of Biochemistry by Lehninger (any edition)

Calculator**:** You need a scientific calculator for this course. Any non-graphing calculator is acceptable. If you are unfamiliar with scientific calculators.

Note sheets/Notebook: Students must take notes and actively engage during the class session. The instructor might ask students to turn in handwritten class notes for assessments.

Course Description

Course Description An introduction to the major biochemical cycles and pathways in living organisms, including reaction steps, regulation and mechanisms. Prerequisite: CHEM 4341 Course context as outlined by the American Chemical Society (ACS) “In the belief that all professional chemists need to know some biochemistry, the ACS guidelines require that approved programs offer and certified majors graduate with the equivalent of three semester hours of biochemistry. Molecular aspects of biological structures, equilibria, energetics, and reactions should be covered in the required biochemistry experience for chemistry majors. Sufficient introduction should be presented so that students can obtain the flavor of modern biochemistry and an appreciation of the important applications in biotechnology “.

Learning Objectives

Students will demonstrate knowledge of basic principles of **bioenergetics and metabolism** and will be able to perform calculations related to bioenergetics Students will demonstrate knowledge of

building blocks, reactions, mechanisms of major metabolic pathways including: glycolysis, TCA cycle, glycogen metabolism, electron transport/oxidative phosphorylation, gluconeogenesis, pentose phosphate pathway, fatty acid metabolism, amino acid metabolism, the urea cycle and nucleotide metabolism Students will be able to discuss how metabolic pathways are controlled and the integration between these major metabolic pathways Students will demonstrate knowledge of how lesions in metabolism can result in disease Students will demonstrate knowledge of biological information flow.
Students will demonstrate knowledge of basic principles of **fluorescence, calorimetric**, and other relevant biotechnology methods (like ELISA).
Students will demonstrate knowledge of active sites of enzymes and enzymatic reactions for specific examples, such as—**carboxypeptidase, carbonic anhydrase, cupredoxins, ribonucleotide reductase**, etc.

Class policies

Communication**:** The best way to contact me is through email, sbanerjee@tamusa.edu. All correspondence between professors and students must occur via university email. You must have Jaguar email account ready and working. If it is not working, contact the help desk at sahelp@tamusa.tamus.edu or at 210-784-4357. Students are expected to access Blackboard for updates on the course, announcements and other course materials. All students are strongly encouraged to come to office hours or make appointments at other times to discuss course material and answer questions.
**Emails should be professional (I am happy to explain this, but professional emails are NOT text messages), clear, and preferably sent within working hours (8 am-6 pm). If you do not hear back in 48 hours, please reach back again. **

Attendance Policy: All students are expected to attend lectures and actively engage in class discussion, activities, and online assignments. Attendance will be monitored and can be used to make decisions on cases of borderline grades. If you are absent, you are responsible for the material covered and are expected to get notes, announcements and any other material from another student in the class.

Absences will be excused if due to illness (medical excuse), death of a close family member, religious holiday, official university activity or cancellation of classes, military duties, pregnancy & related conditions and participation in legal proceedings. Students are STILL REQUIRED TO MAKEUP THE MISSED WORK DUE TO EXCUSED ABSENCE WITHIN SEVEN CALENDAR DAYS AFTER DISCUSSING WITH THE INSTRUCTOR.

Excessive absences (more than 3) and tardiness will not be tolerated. Accumulation of more than three unexcused absences can result in the student being dropped from the class or in one letter lecture grade decreased at the discretion of the instructor.

Conduct and Behavior**:** As an instructor my goal is to create a safe and engaging learning environment for ALL. Class disruptions are unacceptable, asking questions to clarify material during class does not qualify as a disruption and is encouraged. Disruption of the learning environment means creating a situation where other students cannot learn and if such situations arise, the instructor reserves the right to ask the disruptive party to leave the classroom. This includes but is not limited to talking loudly about things not discussed in the class, physical or verbal hostility, texting, use of headphone/listening to music during the class, actively disrupting others or the instructor from learning/teaching.

Use of electronic devices during the class session is not allowed unless instructed by the instructor. During the exams all electronic and transmitting devices MUST be placed in the silent mode and stored in the bag.

Academic misconduct and attempts to cheat during the exam will be pursued according to Texas A&M-San Antonio code of conduct policy. If you need to use the restroom, ask and leave all electronic devices with the instructor.

Visitors: Only students enrolled in the course are allowed in the classroom. No visitors are allowed.

IMPORTANT. Each student receives this information during the first lecture. It is your responsibility to read this material and be familiar with the course content, procedures, and grading.

Recording (audio/video) lectures: If a student wishes to record (audio or video) the lectures, they must take written permission from the instructor prior to start recording.

Grading

Your final grade will be assigned based on your performance in the following areas: (1) three 100 points exams/presentations, (2) a final examination, (3) attendance, and (4) unit end research project. **Any extra credit opportunities (if any) will be announced in class during the semester.**

Table: Assignment categories

Item	Total points
3 hourly exams/presentations	300 points
Final	100 points
Unit end research project	50 points
Class attendance	50 points
Total	500 points

% of Total Points : $\left(\frac{\text{You total points}}{500}\right)$ x 100

Table: Letter grade distribution

Letter Grades:	**A**	**B**	**C**	**D**	**F**
% of Total Points	**90.00 - 100%**	**80.00 - 89.99%**	**70.00 - 79.99%**	**60.00 - 69.99%**	**0 - 59.99%**

What is unit end research project?

This is an individual assignment. At the end of each unit, students are required to identify at least two peer reviewed research articles published in the last 10 years on the topics taught in that unit. After reading these articles, students should write a comprehensive report (2 pages, 12 font size, 1.5 line spacing, use of AI is not allowed) answering the following questions—

a) How are the papers related to the topics taught in that unit?

b) What are the major scientific findings described in the articles?

c) How the learning in the class help/no help in understanding the research articles?

Makeup policy

Exams

If you miss a test due to illness, you must provide a doctor's note to the dean of students and notify the instructor immediately, within 24 hrs of the test date. You are allowed **one** make-up test due to illness. ***Tests will be taken in-person when you are able to return to campus.*** **Should you miss an exam for any other reason, the final exam score will be used for your missed exam.** Should you miss two or more exams via an unexcused absence a grade of F will be assigned. Should you have a question concerning the way that your examination was graded, or if you think that there was an error in calculating the exam score, then it is your responsibility to bring the matter to the attention of the instructor when you pick up your test. Corrections will not be granted after you leave the office.

Homework

All homework will be assigned via Mastering chemistry which is available through blackboard. I encourage you to work on a few problems after every class to reinforce the lecture material. If you miss a homework deadline due to university excused absence, you MUST contact your instructor within 48 hours of the missed homework to plan an extension. After that no extension will be afforded.

Further information

Chemistry tutor: Tutoring can be obtained at the academic learning center. To book an appointment, go to blackboard and click on *brainfuse live tutoring*. Under tutor match, select *science* as a *topic* and CHEM 1311 under subject. Click *Schedule* and choose your preferred date and time.

Visit the academic learning center website for more information: https://www.tamusa.edu/student-resources/Academic-Success-Center/tutoring-services/index.html

Follow the academic learning center on Instagram: @tamusa_alc

Student Misconduct: Appropriate conduct is essential to the effective functioning of the University. University policy defines unacceptable conduct, both academic and non-academic misconduct, and penalties for such behavior in The Student Handbook and The Student Code of Conduct.

Academic Misconduct Policy: Students at Texas A&M University-San Antonio are expected to adhere to the highest standards of academic honesty and integrity. Academic misconduct for which a student

is subject to penalty includes cheating, plagiarism, fabrication, multiple submissions, misrepresentation of academic records, facilitating academic dishonesty, unfair advantage, violating known safety requirements and ethical misconduct. This includes holding other students to the same standards and reporting any incidents of alleged violation of the honesty policy to the instructor involved or, if necessary, to the appropriate academic department head. All students are responsible for being familiar with the Academic Misconduct Policy, which may be found in the Texas A&M University-San Antonio Student Handbook.

University policy prescribes serious consequences for acts of academic misconduct including, but not limited to, a grade of 'F' on the particular paper or assignment or a failing grade in the course. Also, a referral may be issued to the Office of Student Rights and Responsibilities where the sanctions can vary up to possible expulsion from the University. Considering the potential consequences of academic misconduct, it is obviously in students' best interests to avoid even the appearance of such behavior. If you are ever unclear whether a specific act might constitute academic misconduct, please contact your instructor for an assessment of the situation.

All written assignments must be worked on individually. All student term papers, and other written assignments are subject to analysis by anti-plagiarism software. Plagiarism will result in a grade of zero for the assignment.

Table: Key dates

January 20th	First day of classes
February 4th	Census Day
April 17th	Last day to drop with an automatic W
March 9-14th	Spring Break
May 4th	Last day of scheduled classes
May 6-12	Final exams
May 18 Noon	Grades due
Final Exam	TBD

The complete academic calendar is available online:

https://www.tamusa.edu/academics/academic-calendar/current-year/fall-2025.html