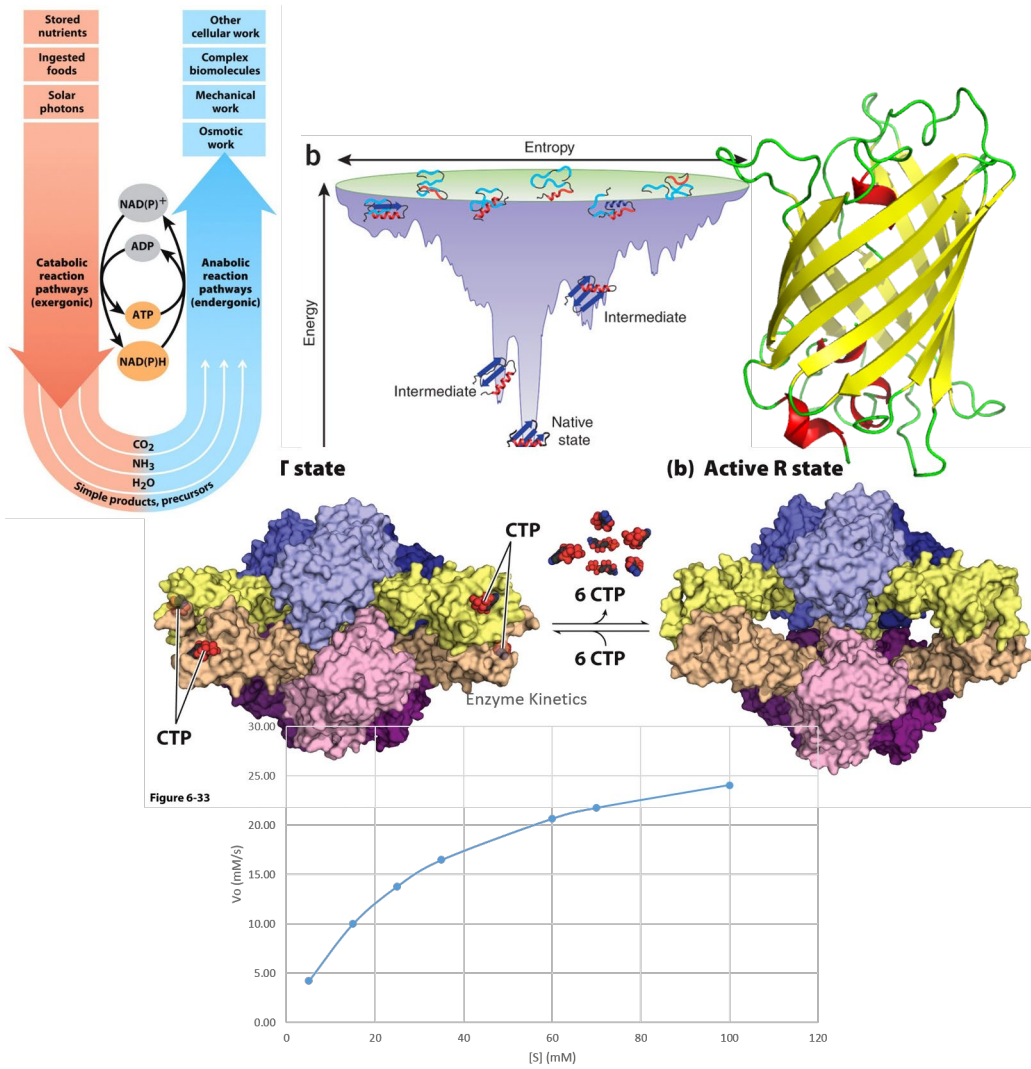


Biochemistry I

CHEM 4334



Let's see how life works!!

Instructor: Dr. Dustin Patterson

Office: Ratliff Building South, Room 3028

Phone: 903-565-5623

Email: dpatterson@uttyler.edu

Office Hours: TBD.

Lecture: Tuesday and Thursday 11:00am-12:20pm face-to-face Ratliff Building North (RBN) room 3035.

Text: Biochemistry: Concepts and Connections by D.R. Appling, S.J. Anthony-Cahill, and C.K. Matthews.

Equipment: Pencils, scientific calculator, and ruler.

Course Resources: Additional materials will be provided as either handouts or through Canvas.

Lecture Recordings: All lectures will be recorded, although the quality of the recordings is not guaranteed, and made available via the course website on Canvas. Recordings are made as a supplement to the class, not a replacement for in-person class attendance. Students are also welcome to make their own recordings of the lecture.

Course Content: Biochemistry I (CHEM 4334) is the first part in a two-part course series providing an introduction to fundamental principles and techniques in the chemistry of life, biochemistry. This course builds upon previous knowledge learned in general chemistry and organic chemistry, as well as biology, physics, and mathematics. This course looks to build foundational knowledge in the underlying chemical composition of cells, building upward to the macro-molecular machinery that sustains life and working toward understanding the complex metabolic pathways and energy transfers occurring within cells. In addition, we will look at experimental methods utilized in biochemistry and incorporate current primary literature in topics discussed in the course where useful.

Course Learning Objectives:

- Learn to identify the molecules that are utilized as the foundation of life and gain understanding in their chemical properties/reactivity
- Understand the principles by which molecules are arranged hierarchically to form the functional materials of biology
- Learn experimental techniques utilized in modern experimental biochemistry and how they are employed practically
- Learn fundamentals in the role that proteins play as macromolecular machines and catalysts that carry out many of life's processes
- Gain an understanding of biocatalysis by enzymes and methods for the characterization and manipulation of their kinetics
- Learn about the arrangement of lipid membranes and the role this plays in forming the barriers that organize and regulate life processes
- Learn fundamentals in membrane transport and chemical gradient formation
- Understand the role that structure plays in the function of biomacromolecules

Grade Distribution:

The majority of your grade will be determined by your performance on several midterm exams, in addition to a final cumulative exam. Due to the nature of biochemistry, all exams are comprehensive, but the material covered since the last examination will receive the greatest emphasis. Examinations will cover all materials from text, lectures, and any assigned materials. Homework projects will also be assigned which will also comprise a significant portion of your grade. The breakdown of these components to your final grade is as follows:

Homework	15%
Midterm Exams (3)	60% (20% each)
Final Exam	<u>25%</u>
Total	100%

Final grades will be determined on a standard grading scale of A 90-100%, B 80-89%, C 70-79%, etc. Incentive points may be added, based on initiative, class participation, and improvement in the course.

Academic Honesty

Cheating of any kind will not be tolerated. Please make yourself aware of the university policy for academic dishonesty in the *Student Guide to Conduct and Discipline at UT Tyler*. During examinations only writing utensils, a calculator (non-programmable), and ruler are the only things that will be allowed on your desk, in addition to scrap paper that will be provided. All questions concerning the exam should be directed to the instructor and any talking amongst students may be punishable by point deductions.

NOTE THE POLICY FOR SMART DEVICES BELOW:

Cell phones and smart watches/electronic devices must be put away during exams. If they are observed out in a visually accessible place (i.e. between legs, on the floor, etc.), it will be assumed that they are being used to cheat and your exam will be taken, you will receive a zero score (0 points) for the exam, and you will be referred to the Office of Judicial Affairs.

Attendance and make-up policy:

Course attendance is expected and is to the benefit of the student. Missing class will likely adversely affect a student's exam performance and will not allow any addition of potential incentive points to their final grade. The instructor should be notified of any expected absences according to the University of Texas at Tyler guidelines and may be excused for reasons allowed by the university (see statements below). Make-ups will be allowed only for reasons outlined in the University of Texas at Tyler bylaws (see below).

Census and Withdraw Dates:

The Census Date is January 29, 2024 and the Last Day to Withdraw is March 25, 2024.

Tentative Lecture Schedule

01/16/24 Introduction and Fundamental Background (Ch. 1, p. 3-17)
01/18/24 Chemical Foundations of Life and the Role of Water (Ch. 2, p. 20-41)
01/23/24 Chemical Foundations of Life and the Role of Water (Ch. 2, p. 20-41)
01/25/24 The Energetics of Life (Ch. 3, p. 49-69)
01/30/24 Nucleic Acids (Ch. 4, p. 73-97)
02/01/24 Introduction to Proteins (Ch. 5, p.109-128)
02/06/24 The Three-Dimensional Structure of Proteins (Ch. 6, p. 145-175)
02/08/24 The Three-Dimensional Structure of Proteins (Ch. 6, p. 145-175)
02/13/24 Experimental Techniques of Protein Biochemistry (Ch. 5 and 6, p. 131-143 and 178-187)
02/15/24 **Exam 1(Ch. 1-5)**
02/20/24 Experimental Techniques of Protein Biochemistry (Ch. 5 and 6, p. 131-143 and 178-187)
02/22/24 Protein Function: Myoglobin and Hemoglobin (Ch. 7, p. 200-220)
02/27/24 Protein Function: Antibodies (Ch. 7, p. 201-209 and 220-227)
02/29/24 Protein Function: Motor Proteins (Ch. 7, p. 220-227)
03/05/24 Enzymes an Introduction (Ch. 8, p. 233-249)
03/07/24 Enzymes an Introduction (Ch. 8, p. 233-249)
03/12/24 and 03/14/24 No Class—Spring Break
03/19/24 Enzymes Kinetics: Michalis-Menten Kinetics (Ch. 8, p. 249-254)
03/21/24 Enzymes Kinetics: Michalis-Menten Kinetics (Ch. 8, p. 249-254)
03/26/24 **Exam 2 (Ch. 6-7 and Experimental Techniques Ch. 5/6)**
03/28/24 Enzymes Inhibition and Regulation (Ch. 8, p. 254-266)
04/02/24 Enzymes Inhibition and Regulation (Ch. 8, p. 254-266)
04/04/24 Carbohydrates (Ch. 9, p. 275-296)
04/09/24 Carbohydrates (Ch. 9, p. 275-296)
04/11/24 Lipids, Membranes (Ch. 10, p. 301-316)
04/16/24 Lipids, Membranes (Ch. 10, p. 301-316)
04/18/24 **Exam 3 (Ch. 8-10)**
04/23/24 Cellular Transport (Ch. 10, p. 317-331)
04/25/24 Cellular Transport (Ch. 10, p. 317-331)

Final Exam: This information can be found on the UT Tyler Spring 2024 Final Exam Schedule. See www.uttyler.edu/registrar/ for the link to the official schedule.

I reserve the right to make modifications as needed to the course. This will be done in accordance with university bylaws.

UT Tyler Honor Code

Every member of the UT Tyler community joins together to embrace: Honor and integrity that will not allow me to lie, cheat, or steal, nor to accept the actions of those who do.

Students Rights and Responsibilities

To know and understand the policies that affect your rights and responsibilities as a student at UT Tyler, please follow this link: <http://www.uttyler.edu/wellness/rightsresponsibilities.php>

Campus Carry

We respect the right and privacy of students 21 and over who are duly licensed to carry concealed weapons in this class. License holders are expected to behave responsibly and keep a handgun secure and concealed. More information is available at <http://www.uttyler.edu/about/campus-carry/index.php>

UT Tyler a Tobacco-Free University

All forms of tobacco will not be permitted on the UT Tyler main campus, branch campuses, and any property owned by UT Tyler. This applies to all members of the University community, including students, faculty, staff, University affiliates, contractors, and visitors. Forms of tobacco not permitted include cigarettes, cigars, pipes, water pipes (hookah), bidis, kreteks, electronic cigarettes, smokeless tobacco, snuff, chewing tobacco, and all other tobacco products. There are several cessation programs available to students looking to quit smoking, including counseling, quitlines, and group support. For more information on cessation programs please visit www.uttyler.edu/tobacco-free.

Grade Replacement/Forgiveness and Census Date Policies

Students repeating a course for grade forgiveness (grade replacement) must file a Grade Replacement Contract with the Enrollment Services Center (ADM 230) on or before the Census Date of the semester in which the course will be repeated. Grade Replacement Contracts are available in the Enrollment Services Center or at <http://www.uttyler.edu/registrar>. Each semester's Census Date can be found on the Contract itself, on the Academic Calendar, or in the information pamphlets published each semester by the Office of the Registrar. Failure to file a Grade Replacement Contract will result in both the original and repeated grade being used to calculate your overall grade point average. Undergraduates are eligible to exercise grade replacement for only three course repeats during their career at UT Tyler; graduates are eligible for two grade replacements. Full policy details are printed on each Grade Replacement Contract.

The Census Date is the deadline for many forms and enrollment actions of which students need to be aware. These include:

- Submitting Grade Replacement Contracts, Transient Forms, requests to withhold directory information, approvals for taking courses as Audit, Pass/Fail or Credit/No Credit.
- Receiving 100% refunds for partial withdrawals. (There is no refund for these after the Census Date)
- Schedule adjustments (section changes, adding a new class, dropping without a "W" grade)
- Being reinstated or re-enrolled in classes after being dropped for non-payment
- Completing the process for tuition exemptions or waivers through Financial Aid

State-Mandated Course Drop Policy

Texas law prohibits a student who began college for the first time in Fall 2007 or thereafter from dropping more than six courses during their entire undergraduate career. This includes courses dropped at another 2-year or 4-year Texas public college or university. For purposes of this rule, a dropped course is any course that is dropped after the census date (See Academic Calendar for the specific date). Exceptions to the 6-drop rule may be found in the catalog. Petitions for exemptions must be submitted to the Enrollment Services Center and must be accompanied by documentation of the extenuating circumstance. Please contact the Enrollment Services Center if you have any questions.

Disability/Accessibility Services

In accordance with Section 504 of the Rehabilitation Act, Americans with Disabilities Act (ADA) and the ADA Amendments Act (ADAAA) the University of Texas at Tyler offers accommodations to students with learning, physical and/or psychological disabilities. If you have a disability, including a non-visible

diagnosis such as a learning disorder, chronic illness, TBI, PTSD, ADHD, or you have a history of modifications or accommodations in a previous educational environment, you are encouraged to visit <https://hood.accessiblelearning.com/UTTyler> and fill out the New Student application. The Student Accessibility and Resources (SAR) office will contact you when your application has been submitted and an appointment with Cynthia Lowery, Assistant Director of Student Services/ADA Coordinator. For more information, including filling out an application for services, please visit the SAR webpage at <http://www.uttyler.edu/disabilityservices>, the SAR office located in the University Center, # 3150 or call 903.566.7079.

The University of Texas at Tyler has a continuing commitment to providing reasonable accommodations for students with documented disabilities. Like so many things this Fall, the need for accommodations and the process for arranging them may be altered by the COVID-19 changes we are experiencing and the safety protocols currently in place. Students with disabilities who may need accommodation(s) in order to fully participate in this class are urged to contact the Student Accessibility and Resources Office (SAR) as soon as possible, to explore what arrangements need to be made to ensure access. During the Fall 2020 semester, SAR will be conducting all appointments via ZOOM. If you have a disability, you are encouraged to visit <https://hood.accessiblelearning.com/UTTyler> and fill out the New Student Application. For more information, please visit the SAR webpage at <http://www.uttyler.edu/disabilityservices> or call 903.566.7079.

Student Absence due to Religious Observance

Students who anticipate being absent from class due to a religious observance are requested to inform the instructor of such absences by the second class meeting of the semester.

Student Absence for University-Sponsored Events and Activities

If you intend to be absent for a university-sponsored event or activity, you (or the event sponsor) must notify the instructor at least two weeks prior to the date of the planned absence. At that time the instructor will set a date and time when make-up assignments will be completed.

Social Security and FERPA Statement

It is the policy of The University of Texas at Tyler to protect the confidential nature of social security numbers. The University has changed its computer programming so that all students have an identification number. The electronic transmission of grades (e.g., via e-mail) risks violation of the Family Educational Rights and Privacy Act; grades will not be transmitted electronically.

Emergency Exits and Evacuation

Everyone is required to exit the building when a fire alarm goes off. Follow your instructor's directions regarding the appropriate exit. If you require assistance during an evacuation, inform your instructor in the first week of class. Do not re-enter the building unless given permission by University Police, Fire department, or Fire Prevention Services.

Student Standards of Academic Conduct

Disciplinary proceedings may be initiated against any student who engages in scholastic dishonesty, including, but not limited to, cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student or the attempt to commit such acts.

i. "Cheating" includes, but is not limited to:

- copying from another student's test paper;
- using, during a test, materials not authorized by the person giving the test;
- failure to comply with instructions given by the person administering the test;
- possession during a test of materials which are not authorized by the person giving the test, such as class notes or specifically designed "crib notes". The presence of textbooks constitutes a violation if they have been specifically prohibited by the person administering the test;
- using, buying, stealing, transporting, or soliciting in whole or part the contents of an unadministered test, test key, homework solution, or computer program;

- collaborating with or seeking aid from another student during a test or other assignment without authority;
- discussing the contents of an examination with another student who will take the examination;
- divulging the contents of an examination, for the purpose of preserving questions for use by another, when the instructor has designated that the examination is not to be removed from the examination room or not to be returned or to be kept by the student;
- substituting for another person, or permitting another person to substitute for oneself to take a course, a test, or any course-related assignment;
- paying or offering money or other valuable thing to, or coercing another person to obtain an unadministered test, test key, homework solution, or computer program or information about an unadministered test, test key, home solution or computer program;
- falsifying research data, laboratory reports, and/or other academic work offered for credit;
- taking, keeping, misplacing, or damaging the property of The University of Texas at Tyler, or of another, if the student knows or reasonably should know that an unfair academic advantage would be gained by such conduct; and
- misrepresenting facts, including providing false grades or resumes, for the purpose of obtaining an academic or financial benefit or injuring another student academically or financially.

ii. “Plagiarism” includes, but is not limited to, the appropriation, buying, receiving as a gift, or obtaining by any means another’s work and the submission of it as one’s own academic work offered for credit.

iii. “Collusion” includes, but is not limited to, the unauthorized collaboration with another person in preparing academic assignments offered for credit or collaboration with another person to commit a violation of any section of the rules on scholastic dishonesty.

iv. All written work that is submitted will be subject to review by plagiarism software.

UT Tyler Resources for Students:

- UT Tyler Writing Center (903.565.5995), writingcenter@uttyler.edu
- UT Tyler Tutoring Center (903.565.5964), tutoring@uttyler.edu
- The Mathematics Learning Center, RBN 4021, this is the open access computer lab for math students, with tutors on duty to assist students who are enrolled in early-career courses.
- UT Tyler Counseling Center (903.566.7254)