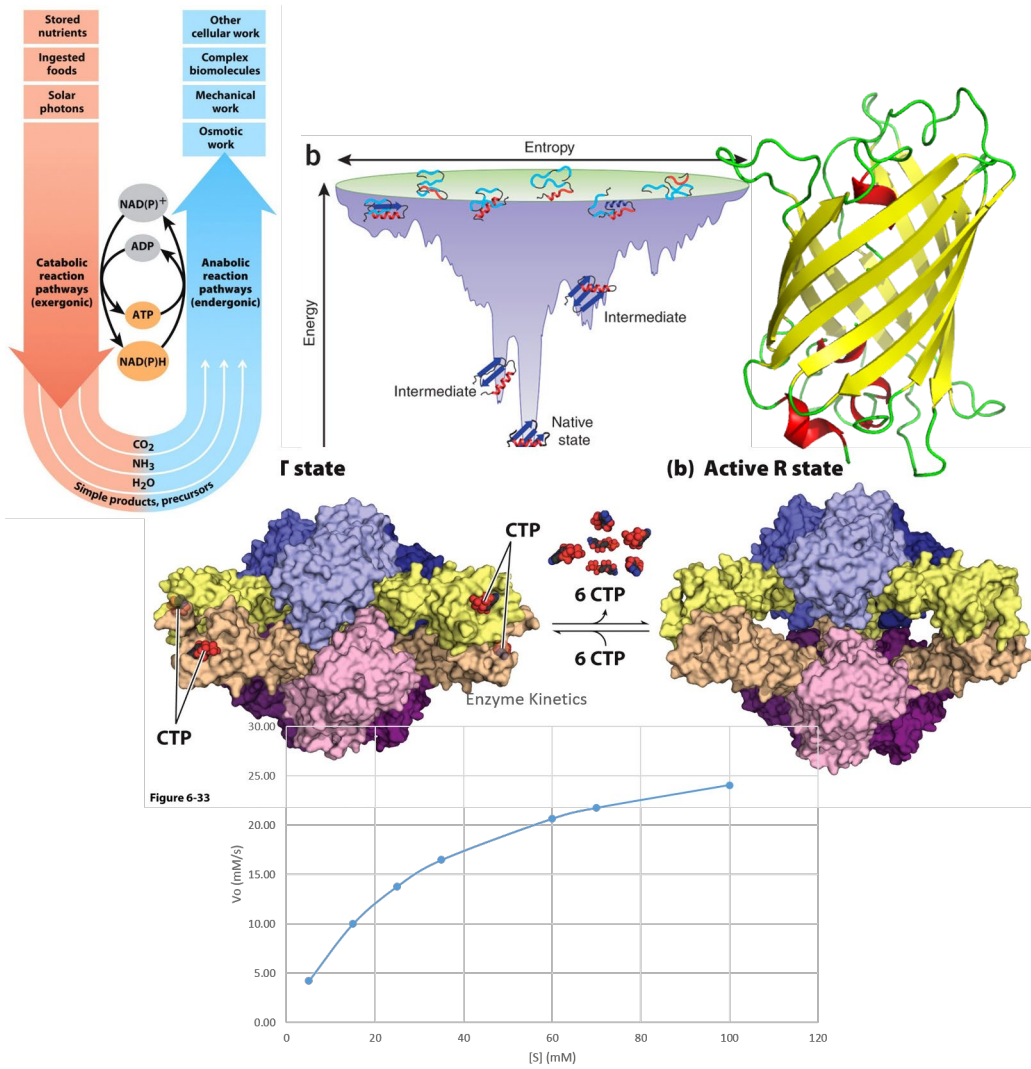


# Biochemistry I

## CHEM 4334



Let's see how life works!!

**Instructor:** Dr. Dustin Patterson

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**Phone:** 903-565-5623

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**Office Hours:** Monday 1-3 pm, Thursday 2-3 pm, and by appointment.

**Lecture:** Tuesday and Thursday 9:30-10:50 am in Braithwaite Building room 1055.

**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:** I encourage you all to regularly attend lecture, in-person, at our normally scheduled meeting time and place. However, personal situations may not always allow in-class attendance. In addition, students have found that the ability to re-listen to lectures is often helpful toward study efforts. In light of these points, all lectures will be recorded and made available via the course website on Canvas—**although I cannot guarantee that the recording will be available in the event that electronic recording does not work properly.** 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. Bi-weekly 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 may be provided (if necessary). 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 September 1, 2023 and the Last Day to Withdraw is October 30, 2023.

**Tentative Lecture Schedule**

- 08/22/23 Introduction and Fundamental Background (Ch. 1, p. 3-17)  
08/24/23 Chemical Foundations of Life and the Role of Water (Ch. 2, p. 19-41)  
08/29/23 Chemical Foundations of Life and the Role of Water (Ch. 2, p. 19-41)  
08/31/23 The Energetics of Life (Ch. 3, p. 49-69)  
09/05/23 Nucleic Acids (Ch. 4, p. 73-97)  
09/07/23 Introduction to Proteins (Ch. 5, p.109-128)  
09/12/23 The Three-Dimensional Structure of Proteins (Ch. 6, p. 145-175)  
09/14/23 The Three-Dimensional Structure of Proteins (Ch. 6, p. 145-175)  
09/19/23 Experimental Techniques of Protein Biochemistry (Ch. 5 and 6, p. 131-143 and 178-187)  
09/21/23 **Exam 1(Ch. 1-5)**  
09/26/23 Experimental Techniques of Protein Biochemistry (Ch. 5 and 6, p. 131-143 and 178-187)  
09/28/23 Protein Function: Myoglobin and Hemoglobin (Ch. 7, p. 200-220)  
10/03/23 Protein Function: Antibodies (Ch. 7, p. 191-199)  
10/05/23 Protein Function: Motor Proteins (Ch. 7, p. 220-227)  
10/10/23 Enzymes an Introduction (Ch. 8, p. 233-249)  
10/12/23 Enzymes Kinetics: Michaelis-Menten Kinetics (Ch. 8, p. 249-254)  
10/17/23 Enzymes Kinetics: Michaelis-Menten Kinetics (Ch. 8, p. 249-254)  
10/19/23 Enzymes Inhibition and Regulation (Ch. 8, p. 254-266)  
10/24/23 Enzymes Inhibition and Regulation (Ch. 8, p. 254-266)  
10/26/23 **Exam 2 (Ch. 6-8 and Experimental Techniques)**  
10/31/23 Carbohydrates (Ch. 9, p. 275-296)  
11/02/23 Carbohydrates (Ch. 9, p. 275-296)  
11/07/23 Lipids, Membranes (Ch. 10, p. 301-316)  
11/09/23 Lipids, Membranes (Ch. 10, p. 301-316)  
11/14/23 Cellular Transport (Ch. 10, p. 317-331)  
11/16/23 **Exam 3 (Ch. 9-10)**  
**11/21/23 and 11/23/23 No Class—Thanksgiving Break**  
11/28/23 Cellular Transport (Ch. 10, p. 317-331)  
11/30/23 Wrap Up—Bringing It All Together
- 12/07/23 **Final Exam 9:30am-11:30am** (see note below)

**Final Exam:** The final exam is comprehensive and will be held **Thursday, December 7, from 9:30am-11:30am in the regular scheduled classroom**, unless administrative changes are announced. See [www.uttyler.edu/registrar/](http://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.**

### **University Policies**

**Withdrawing from Class** - Students, you are allowed to [withdraw Links to an external site.](#) (drop) from this course through the [Withdrawal Portal Links to an external site.](#) Withdrawing from classes can impact Financial Aid, Scholarships, Veteran Benefits, Exemptions, Waivers, International Student Status, housing, and degree progress. Please read this page, speak with your instructors, consider your options, and speak with your instructor. UT Tyler faculty and staff are here for our students and often can provide additional support options or student assistance. Please read the implications for withdrawing from a course and the instructions on using the Withdrawal portal on the [Registrar's Withdrawal page Links to an external site.](#)

Texas law prohibits students 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 other 2-year or 4-year Texas public colleges and universities. Consider the impact withdrawing from this class has on your academic progress and other areas, such as financial implications. We encourage you to consult your advisor(s) and financial aid for additional guidance. CAUTION #1: Withdrawing before census day does not mean you get a full refund. Please see the [Tuition and Fee Refund Schedule Links to an external site.](#) CAUTION #2: All international students must check with the [Office of International Programs Links to an external site.](#) before withdrawing. All international students are required to enroll full-time for fall and spring terms. CAUTION #3: All UT Tyler Athletes must check with the Athletic Academic Coordinator before withdrawing from a course. CAUTION #4: All veterans or military-affiliated students should consult with the [Military and Veterans Success Center](#)

- [Links to an external site.](#)
- **Final Exam Policy:** Final examinations are administered as scheduled. If unusual circumstances require that special arrangements be made for an individual student or class, the Dean of the appropriate college, after consultation with the faculty member involved, may authorize an exception to the schedule. Faculty members must maintain student final examination papers for a minimum of three months following the examination date.
- **Incomplete Grade Policy:** If a student, because of extenuating circumstances, is unable to complete all of the requirements for a course by the end of the semester, then the instructor may recommend an Incomplete (I) for the course. The "I" may be assigned in place of a grade only when all of the following conditions are met: (a) the student has been making satisfactory progress in the course; (b) the student is unable to complete all coursework or final exam due to unusual circumstances that are beyond personal control and are acceptable to the instructor, and (c) the student presents these reasons before the time that the final grade roster is due. The semester credit hours for an Incomplete will not be used to calculate the grade point average.  
The student and the instructor must submit an Incomplete Form detailing the work required and the time by which the work must be completed to their respective department chair or college dean for approval. The time limit established must not exceed

one year. Should the student fail to meet all of the work for the course within the time limit, then the instructor may assign zeros to the unfinished work, compute the course average for the student, and assign the appropriate grade. If a grade has yet to be assigned within one year, then the Incomplete will be changed to an F, or NC. If the course was initially taken under the CR/NC grading basis, this may adversely affect the student's academic standing.

- **Grade Appeal Policy:** - Disputes regarding grades must be initiated within sixty (60) days from the date of receiving the final course grade by filing a Grade Appeal Form with the instructor who assigned the grade; this is separate from the Application for Appeal form submitted to the Student Appeals Committee, which does not rule on grade disputes as described in this policy. If the student is not satisfied with the decision, the student may appeal in writing to the Chairperson of the department from which the grade was issued. In situations where there is an allegation of capricious grading, discrimination, or unlawful actions, appeals may go beyond the Chairperson to the Dean of the college from which the grade was issued, with that decision being final. The Grade Appeal form is found in the [Registrar's Form Library](#).

- [Links to an external site.](#)

- **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 a history of modifications or accommodations in a previous educational environment, you are encouraged to visit <https://hood.accessiblelearning.com/UTTyler> [Links to an external site.](#) 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 the Assistant Director Student Accessibility and Resources/ADA Coordinator. For more information, including filling out an application for services, please visit the SAR webpage at <https://www.uttyler.edu/disability-services>

- [Links to an external site.](#), the SAR office located in the University Center, # 3150, or call 903.566.7079."

- **Military Affiliated Students:** UT Tyler honors the service and sacrifices of our military-affiliated students. If you are a student who is a veteran, on active duty, in the reserves or National Guard, or a military spouse or dependent, please stay in contact with your faculty member if any aspect of your present or prior service or family situation makes it difficult for you to fulfill the requirements of a course or creates disruption in your academic progress. It is important to make your faculty member aware of any complications as far in advance as possible. Your faculty member is willing to work with you and, if needed, put you in contact with university staff who are trained to assist you. The [Military and Veterans Success Center \(MVSC\)](#)

- [Links to an external site.](#) has campus resources for military-affiliated students. The MVSC can be reached at [MVSC@uttyler.edu](mailto:MVSC@uttyler.edu) or via phone at 903.565.5972.

- **Academic Honesty and Academic Misconduct:** The UT Tyler community comes together to pledge that "Honor and integrity will not allow me to lie, cheat, or steal, nor to accept the actions of those who do." Therefore, we enforce the [Student Conduct and Discipline policy](#)

- [Links to an external site.](#) in the Student Manual Of Operating Procedures (Section 8).
- **FERPA** - UT Tyler follows the Family Educational Rights and Privacy Act (FERPA) as noted in [University Policy 5.2.3](#)
- [Links to an external site.](#). The course instructor will follow all requirements to protect your confidential information.
- **Absence for Official University Events or Activities:** This course follows the practices related to approved absences as noted by the Student Manual of Operating Procedures ([Sec. 1 -501](#)
- [Links to an external site.](#)).
- **Absence for Religious Holidays:** This course follows the practices related to [Excused Absences for Religious Holy Days as noted in the Catalog](#)
- [Links to an external site.](#).
- **Campus Carry:** We respect the right and privacy of students 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>.