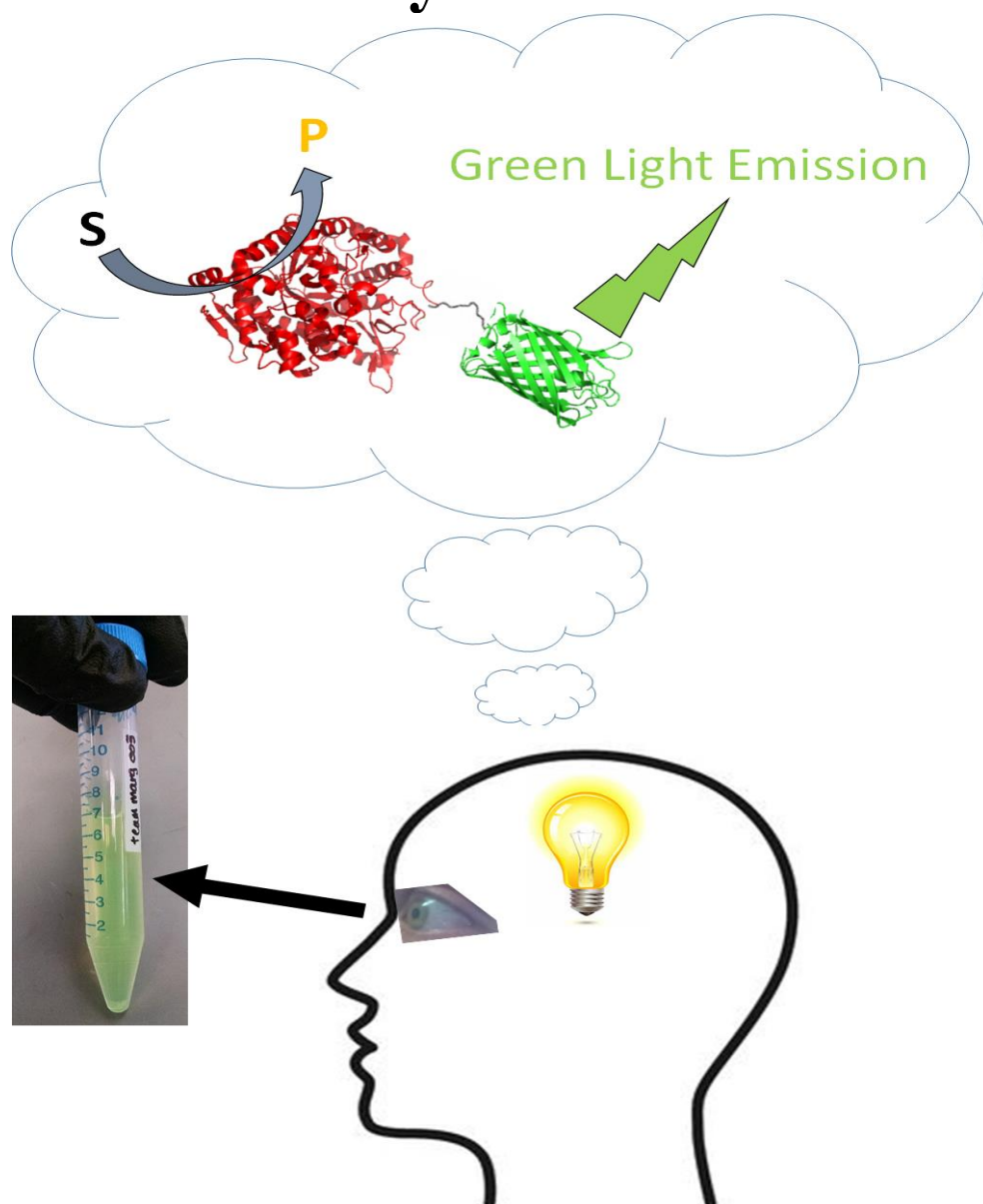


CHEM 4135

Biochemistry Laboratory

Syllabus



Let's see some biochemistry!!

**CHEM 4135
Section 005**

Biochemistry Laboratory

Fall 2025

Instructor: Dr. Dustin Patterson

Office: Ratliff Building South, Room 3028

Phone: 903-565-5623

Email: dpatterson@uttyler.edu

Office Hours: Monday 1-3 pm, Tuesday 11:30 am -12:30 pm and by appointment.

Lab Meeting: Tuesday 1:00-6:00 pm in Ratliff Building South, Room 4007

Text: The lab manual is provided through the Canvas website for the course.

Required Equipment:

- 1) A bound notebook with index and carbonless copies
- 2) A scientific calculator
- 3) 12-inch ruler with metric scale
- 4) Close toed shoes
- 5) Safety goggles

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

Course Content:

The course is designed to give students hands on experience in modern experimental biochemistry. Students will learn proper techniques in pipetting, buffer preparation, spectroscopy, protein and enzyme purification, gel electrophoresis, column chromatography, immunoblotting, enzyme kinetics, and protein crystallization.

Course Learning Objectives:

1. Provide thorough understanding of fundamental techniques in modern experimental protein biochemistry
2. Develop problem solving skills in experimental biochemistry
3. Encourage both collaborative and independent experimentation by students
4. Provide a learning environment where students are free to inquire and explore to gain a better understanding of the techniques and underlying principles

Grade Distribution:

The grades will be calculated according to the following scheme:

Pre-Lab Assignments	10%
Communication Lab Reports	60%
Comprehensive Lab Report	30%

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.

Lab Reports:

Two types of lab reports will be due during the semester, 1) **Communications** and 2) **Comprehensive Reports**. The differences are explained as follows:

- 1) **Communications** summarize the results for a single lab or short sequence of experiments and are limited to a **maximum of 3 pages**, not including references and attached notebook pages. Each communication is worth 10% of your final grade.
- 2) **Comprehensive Reports** encompass the findings from an entire series of experiments and are limited to a **maximum of 5 pages**, not including any references and attached notebook pages. Each comprehensive article is worth 15% of your final grade.

Lab reports should provide a clear, well thought out presentation of the data in its final processed form (see lab report example). There will be 6 regular lab reports and 2 comprehensive lab reports due and they are as follows:

<u>Communications-</u>	<u>Due Date</u>
Exp. 1 Quantitative Pipetting	09/05/25
Exp. 2 Theory and Measurement of pH and pKa	09/19/25
Exp. 4 Introduction to UV-Vis Spectroscopy	10/03/25
Exp. 5a Protein Purification of CelB-GFP-6xHis	10/10/25
Exp. 5b and 5c SDS-PAGE and Western Blotting of CelB-GFP-6xHis	10/25/25
Exp. 5d and 5e Enzyme Kinetics of CelB-GFP-6xHis	11/07/25

Comprehensive Reports-

Exp. 5 Comprehensive CelB-GFP-6xHis Purification and Characterization	11/21/25
Exp. 6 Comprehensive LDH Purification and Characterization	12/05/25

Comprehensive reports will be a compilation of all results from an experimental series into a single, cohesive lab report.

Lab reports must be turned in by the end (11:59 pm) of the due date by online submission via the submission turn in folder on the Canvas webpage for the course. Lab reports that are submitted late will receive the following deductions from the total possible points:

Late 1 day: 10% points deduction

Late 2 days: 20% points deduction

Late 3 days: 30% points deduction

Late 4 days: 50% points deduction

Late 5 days: 70% points deduction

Late 6 days: no credit

All lab reports must be submitted electronically to the turn in folder on the course Canvas site.

Pre-lab Assignments. Pre-lab questions will be posted as handouts to Canvas the week before the experiment is to be carried out. The Pre-lab will require calculations and answers to questions that will prepare students for the upcoming laboratory session.

Artificial Intelligence Use Policy:

For this course, artificial intelligence (AI) use is not permitted. The work submitted by students in this course will be generated by themselves. This includes all process work, drafts, brainstorming artifacts, editing, and final products. This extends to group assignments where students must collaboratively create the project. Any instance of the following constitutes a violation of UT Tyler's Honor Code: a student has another person/entity do any portion of a graded assignment, which includes purchasing work from a company, hiring a person or company to complete an assignment or exam, using a previously submitted assignment and/or using AI tools (such as ChatGPT).

Attendance and make-up policy:

Course attendance is required. Students who do not attend will not be able to carry out experiments and obtain data for their lab reports, which is required to receive full credit. 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. Make-ups will be allowed only for reasons outlined in the University of Texas at Tyler bylaws.

Census and Withdraw Dates:

The Census Date is September 8, 2025, and the Last Day to Withdraw is November 3, 2025.

Laboratory Schedule

08/29/25	Exp. 1: Quantitative Pipetting Skills & Statistical Analysis
09/05/25	No Lab—Labor Day Week
09/12/25	Exp. 2: Theory and Measurement of pH and pK_a
09/19/25	Exp. 3: Buffer Preparation
09/26/25	Exp. 4: Introduction to UV-Vis Spectroscopy
10/03/25	Exp. 5a: Protein Purification: Lysis, Centrifugation, and Affinity Chromatography of CelB-GFP-6xHis
10/10/25	Exp. 5b: SDS-PAGE (CelB-GFP-6xHis) and begin 5c: Western Blotting
10/17/25	Finish Exp. 5c: Western Blot of CelB-GFP-6xHis

10/25/25	Exp. 5d: CelB-GFP-6xHis Enzyme Kinetics
10/31/25	Exp. 5e: CelB-GFP-6xHis Kinetic Analysis
11/07/25	Exp. 6a: Purification of Lactate Dehydrogenase (LDH) from Bovine Heart by Homogenization and Ammonium Sulfate Precipitation
11/14/25	Exp. 6b: Purification of LDH by Ion Exchange Chromatography
11/21/25	Exp. 6c: SDS-PAGE and Enzyme Kinetics of LDH and Exp. 7: Protein Crystallization set up
11/28/25	No Class—Thanksgiving Break
12/05/25	Exp. 7: Protein Crystallization and clean-up

Final Exam: No written exam will be administered.

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

Student Resources:

Resources to assist you in this course

- [UT Tyler Student Accessibility and Resource \(SAR\) Office](#)[Links to an external site.](#) (provides needed accommodations to students with document needs related to access and learning)
- [UT Tyler Writing Center](#)[Links to an external site.](#)
- [The Mathematics Learning Center](#)[Links to an external site.](#)
- [UT Tyler PASS Tutoring Center](#)[Links to an external site.](#)
- [UT Tyler Supplemental Instruction](#)[Links to an external site.](#)
- [Upswing \(24/7 online tutoring\)](#) - covers nearly all undergraduate course areas[Links to an external site.](#)
- [Robert Muntz Library](#)[Links to an external site.](#) and [Library Liaison](#)[Links to an external site.](#)
- [Canvas 101](#) (learn to use Canvas, proctoring, Unicheck, and other software)
- LIB 422 -- Computer Lab where students can take a proctored exam
- [The Career Success Center](#)[Links to an external site.](#)
- [UT Tyler Testing Center](#)[Links to an external site.](#)
- [Office of Research & Scholarship Design and Data Analysis Lab](#)[Links to an external site.](#)

Resources available to UT Tyler Students

- [UT Tyler Counseling Center](#) [Links to an external site.](#)(available to all students)
- [My SSP App](#)[Links to an external site.](#) (24/7 access to Student Support Program counseling through phone or chat and online wellness resources available in a variety of languages)
- [Student Assistance and Advocacy Center](#)[Links to an external site.](#)
- [Military and Veterans Success Center](#) [Links to an external site.](#)(supports for all of our military-affiliated students)
- [UT Tyler Patriot Food Pantry](#)[Links to an external site.](#)
- [UT Tyler Financial Aid and Scholarships](#)[Links to an external site.](#)
- [UT Tyler Student Business Services](#)[Links to an external site.](#) (pay or set up payment plans, etc.)

- [UT Tyler Registrar's Office](#)[Links to an external site.](#)
- [Office of International Programs](#)[Links to an external site.](#)
- [Title IX Reporting](#)[Links to an external site.](#)
- [Patriots Engage](#)[Links to an external site.](#) (available to all students. Get engaged at UT Tyler.)

University Policies and Information

Withdrawing from Class

Students may [withdraw](#) (drop) from this course using the [Withdrawal Portal](#). Withdrawing (dropping) this course can impact your Financial Aid, Scholarships, Veteran Benefits, Exemptions, Waivers, International Student Status, housing, and degree progress. Please speak with your instructors, consider your options, speak with your advisor, and visit the One-Stop Service Center (STE 230) or email enroll@uttyler.edu to get a complete review of your student account and the possible impacts to withdrawing. We want you to make an informed decision. UT Tyler faculty and staff are here for you and often can provide additional support options or assistance. Make sure to carefully [read the implications for withdrawing from a course and the instructions](#) on using the [Withdrawal portal](#).

Texas law prohibits students from dropping more than six courses during their entire undergraduate career*. The six courses dropped include those from 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 Enrollment Services 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](#). **CAUTION #2:** All international students must check with the [Office of International Programs](#) 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](#).

* Students who began college for the first time before 2007 are exempt from this law.

Artificial Intelligence Statement

UT Tyler is committed to exploring and using artificial intelligence (AI) tools as appropriate for the discipline and task undertaken. We encourage discussing AI tools' ethical, societal, philosophical, and disciplinary implications. All uses of AI should be acknowledged as this aligns with our commitment to honor and integrity, as noted in UT Tyler's Honor Code. Faculty and students must not use protected information, data, or copyrighted materials when using any AI tool. Additionally, users should be aware that AI tools rely on predictive models to generate content that may appear correct but is sometimes shown to be incomplete, inaccurate, taken without attribution from other sources, and/or biased. Consequently, an AI tool should not be considered a substitute for traditional approaches to research. You are ultimately responsible for the quality and content of the information you submit. Misusing AI tools that violate the guidelines

specified for this course is considered a breach of academic integrity. The student will be subject to disciplinary actions as outlined in UT Tyler's Academic Integrity Policy. Refer to the About This Course section of the UT Tyler Syllabus Module for specific information on appropriate use of AI in your course(s).

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. A grade appeal should be used when the student thinks the final course grade awarded does not reflect the grades earned on assessments or follow the grading scale as documented in the syllabus. The student should provide the rationale for the grade appeal and attach supporting document about the grades earned. The form should be sent via email to the faculty member who assigned the grade. The faculty member reviews the rationale and supporting documentation and completes the instruction section of the form. The instructor should return the form to the student, even if a grade change is made at this level. 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 or the Dean's designee 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](#).

NOTE: The Grade Appeal Form is different from the Application for Appeal form submitted to the Student Appeals Committee, which does not rule on grade disputes as described in this policy.

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/> 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>, the SAR office located in the Robert Muntz Library, LIB 460, email saroffice@uttyler.edu, 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 \(MVSC\)](#) has campus resources for military-affiliated students. The MVSC can be reached at MVSC@uttyler.edu or via phone at 903.565.5972.

Students on an F-1 Visa

To remain in compliance with Federal Regulations requirements you must do the following:

- Traditional face-to-face classes: Attend classes on the regular meeting days/times.
- Hybrid Classes: Attend all face-to-face classes convened by the instructor according to the schedule set for your specific course.

- Online course: Only one online course can count toward your full-time enrollment. Students are expected to be fully engaged and meet all requirements for the online course.

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](#) 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](#). 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 [Excused Absences for University Events or Activities](#) as noted in the Catalog.

Absence for Religious Holidays

This course follows the practices related to [Excused Absences for Religious Holy Days as noted in the Catalog](#).

Absence for Pregnant Students

This course follows the requirements of Texas Laws SB 412, SB 459, SB 597/HB 1361 to meet the needs of pregnant and parenting students. Part of the supports afforded pregnant students includes excused absences. Faculty who are informed by a student of needing this support should make a referral to the Parenting Student Liaison. NOTE: Students must work with the Parenting Student Liaison in order to receive these supports. Students should reach out to the Parenting Student Liaison at parents@uttyler.edu and also complete the [Pregnant and Parenting Self-Reporting Form](#).

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>.