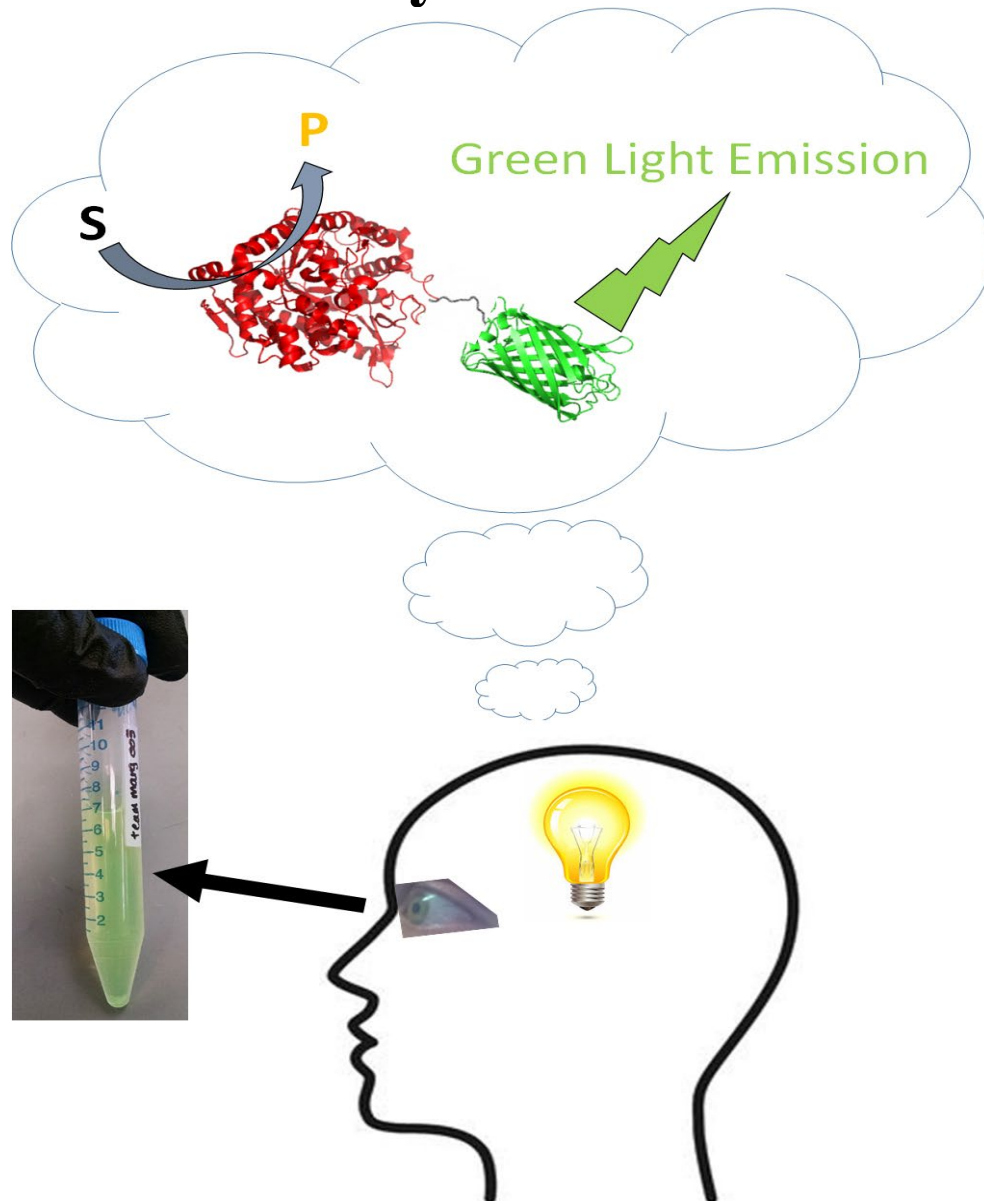


CHEM 4135

Biochemistry Laboratory

Syllabus



Let's see some biochemistry!!

**CHEM 4135
Section 001**

Biochemistry Laboratory

Fall 2023

Instructor: Dr. Dustin Patterson

Office: Ratliff Building South, Room 3028

Phone: 903-565-5623

Email: dpatterson@uttyler.edu

Office Hours: Monday 1-3 pm, Thursday 2-3 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, protein crystallization, and protein molecular modeling.

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 report due and they are as follows:

<u>Communications-</u>	<u>Due Date</u>
Exp. 1 Quantitative Pipetting	08/29/23
Exp. 2 Theory and Measurement of pH and pKa	09/12/23
Exp. 4 Introduction to Spectroscopy	09/26/23
Exp. 5a Protein Purification and Quantitation of CelB-GFP	10/03/23
Exp. 5b and 5c SDS-PAGE and Western Blotting of CelB-GFP	10/17/23
Exp. 5d and 5e Enzyme Kinetics of CelB	10/24/23
<u>Comprehensive Reports-</u>	
Exp. 5 Comprehensive CelB-GFP Purification and Characterization	11/07/23
Exp. 6 Comprehensive LDH Purification and Characterization	12/05/23

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 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: 30% points deduction

Late 3 days: 50% points deduction

Late 4 days: 70% points deduction

Late 5 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.

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 (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.

Laboratory Schedule (Note this is only a tentative schedule and is subject to change)

08/22/23	Exp. 1: Quantitative Pipetting Skills & Statistical Analysis
08/29/23	Exp. 2: Theory and Measurement of pH and pK _a
09/05/23	Exp. 3: Buffer Preparation
09/12/23	Exp. 4: Introduction to UV-Vis Spectroscopy
09/19/23	Exp. 5a: Protein Purification: Lysis, Centrifugation, and Affinity Chromatography of CelB-GFP
09/26/23	Exp. 5b: SDS-PAGE (CelB-GFP) and begin 5c: Western Blotting
10/03/23	Finish Exp. 5c: Western Blot of CelB-GFP
10/10/23	Exp. 5d: CelB Enzyme Kinetics
10/17/23	Exp. 5e: CelB Kinetic Analysis
10/24/23	Exp. 6a: Purification of Lactate Dehydrogenase (LDH) from Bovine Heart by Homogenization and Ammonium Sulfate Precipitation
10/31/23	Exp. 6b: Purification of LDH by Ion Exchange Chromatography
11/07/23	Exp. 6c: SDS-PAGE and Enzyme Kinetics of LDH
11/14/23	Exp. 7: Protein Crystallization Set Up
11/21/23	No Class—Thanksgiving Break
11/28/23	Exp. 7: Protein Crystallization Evaluation

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.**

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 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>.