BIOL 3380 Course Syllabus – Summer 2025
Biochemistry Laboratory
Updated May 12, 2025

	Room	Section	Day	Time	Instructor	
					Labs 1-5	**Labs 6-10**
Lecture	SLC 2.303	**0u1**	Tuesday	8:30 am – 9:50 am	Srinivasan	Pickett
Lab	SLC 2.207	**3u3**	Thursday	8:30 am – 12:30 pm	Srinivasan	Pickett
Lab	SLC 2.207	**3u4**	Thursday	1:30 pm – 5:30 pm	Srinivasan	Pickett

Contact Information

	Room	**Phone**	**email**
Dr. Elizabeth Pickett	SLC 2.402	972-883-2646	beth.pickett@utdallas.edu
Dr. Bhooma Srinivasan			bhooma.srinivasan@utdallas.edu

Course Information

We are available during the week to discuss any educational matter that you think necessary. Please stop by any of the weekly lab sessions, email, or call for an in-person or TEAMS appointment.

If you have ideas for improvements to either the course or the laboratory facilities, please do not wait until the end of semester course evaluations to make those suggestions. We are fully open to constructive criticism, especially if alternative solutions are possible.

Graduate teaching assistants will be grading the lab reports under the supervision of the instructor. You are encouraged to contact the TAs about any questions concerning grading of the lab reports. If they are not able to satisfactorily answer your questions, then we strongly encourage you to contact us directly about our grading issues. We cannot make corrections unless you make us aware of issues.

Course Pre-requisites, Co-requisites, and/or Other Restrictions

Pre-Requisite:	BIOL2281 or CHEM2401
Pre/Co-requisite:	BIOL3461
Suggested:	BIOL3401

Course Description

BIOL3380 Biochemistry Laboratory (3 semester hours) Current techniques in the purification and characterization of enzymes to demonstrate fundamental principles that are utilized in modern biochemistry and molecular biology research laboratories. Practical skills taught include micropipetting, basic solution preparation, isolating crude enzyme extracts, and performing standard activity assays. Advanced experiments with Green Fluorescent Protein include Ni^{+2}-NTA affinity chromatography, protein detection using Bradford and spectrophotometric assays, SDS-PAGE separation, Western Blot analysis, and enzyme kinetics.

Student Learning Objectives/Outcomes

Objectives: The goal of this course is to give students hands-on learning of current techniques in the purification and characterization of enzymes to demonstrate fundamental principles that are utilized in modern Biochemistry and Molecular Biology research laboratories. Practical skills taught include micropipetting, basic solution preparation, isolating crude enzyme extracts, and performing standard activity assays. Advanced experiments with Green Fluorescent Protein and Lactate Dehydrogenase include Ni^{+2}-NTA affinity chromatography, protein detection using Bradford and spectrophotometric assays, SDS-PAGE separation, Western Blot analysis, enzyme kinetics, and basic clinical biochemistry assays. Each laboratory experience builds or interconnects with the others and seeks a balance between biological content and conceptual understanding.

Outcomes: Upon completing this course, students will gain both practical and analytical capabilities that are required for an introductory position in a modern molecular biology/biochemistry research laboratory

Students will be able to:
1. Perform basic math calculations used in biochemistry/molecular biology labs
2. Properly process and present data
3. Interpret data analytically and draw appropriate conclusions
4. Express scientific ideas by writing them in a clear, concise, logical, and accurate manner

Lecture	Lab	Topic	Due Dates
		First Instructional Block	
03 June	1	Safety, Measurements, Solutions and Math	Q1 before lab 1 LR1 at end of lab 1 Math HW before lab 2
10 June	2	Purification/Characterization of a Phosphatase Enzyme	Q2 before lab 2 LR2 11:59pm 20 June
17 June	3 online lab	Expression of rGFP in *E. coli*	Q3 11:59pm 20 June LR3 before lab 4
24 June	4	Purification of rGFP using Ni^{+2}-agarose	Q4 before lab 4 LR4 before lab 5
01 July	5	Determining Protein Concentration of rGFP fractions	Q5 before lab 5 LR5 before lab 6
08 July	---	In-person Open Question and Answer Session	------
08-10 July	**Exam 1**	**Exam 1 and Calc A covering lectures 1-5 and labs 1-4 Conducted at the UTD Testing Center**	
Second Instructional Block			
15 July	6	SDS-PAGE analysis of rGFP fractions	Q6 before lab 6 LR6 before lab 7A
22 July	7a	SDS-PAGE/Western blot transfer rGFP Lab 7a: in-person lab	Q8/LR8 before lab 10
	8 *online lab*	Multi-column purification Lab 8: on-line lab	
29 July	7b	Western Blot Development rGFP	Q7 before lab 7b LR7 before lab 10
05 Aug	10	Enzyme kinetics – LDH	Q10 before lab 10 LR10 at end of lab 10
12 Aug	---	In-person Open Question and Answer Session	-------
12-14 Aug	**Exam 2 Calc B**	**Exam 2 and Calc B focusing on lectures 6-10 and labs 1-8 Conducted at the UTD Testing Center**	

Experiment	Assignment	Max Grade
1	Lab Safety, Measurements, and Solutions	40*
MHW	Math Homework	20
2	Purification/Characterization of a Phosphatase Enzyme	40*
3	Expression of rGFP in *E. coli*	40*
4	Purification of rGFP using Ni^{+2}-agarose	40*
5	Determining Protein Concentration of rGFP fractions	40*
Exam 1	*Exam 1 – lectures 1-5 and labs 1-4*	150
Calc A	Calculations exam – CV=CV, Molarity, Ratios	40
6	SDS-PAGE analysis of rGFP fractions	40*
7a 7b	SDS-PAGE/western blot transfer of rGFP fractions Western Blot Development	--- 40*
8	Multi-column purification	40*
9	NO LAB 9 this summer semester	---
10	Enzyme Kinetics	40*
Exam 2	*Exam 2 – lecture 6-10, labs 1-8*	150
Calc B	Calculations exam – CV=CV, Molarity, Ratios	40
Top Hat	Top Hat Lecture Questions	30
----	On Time Lab Attendance	30
----	Drop your lowest 30-point lab report	(Minus 30)
	Maximum score (not including extra credit)	**790**

** Max score of Experiment online Quiz (10pts) and Experiment Lab Report (30pts)*

Points Earned	Letter Grade		Points Earned	Letter Grade		Points Earned	Letter Grade		Points Earned	Letter Grade
766	A+		687	B+		608	C+		529	D+
742	A		663	B		584	C		505	D
711	A-		632	B-		553	C-		474	D-

Grading Policy

A breakdown of possible points earned during the course is presented below:

Assignment	Points		Assignment	Points
Lab Reports & Quizzes	330		Exam 1	150
Math Homework	20		Exam 2	150
On Time Lab Attendance	30		Calculations Exam A	40
Top Hat Lec Questions	30		Calculations Exam B	40

Final Grades – The final course grades will be assigned based upon the standard grading scale below. We do not "give" any points at the end of the semester to raise a student's letter grade. Students earn their grade throughout the semester.

Points Earned	Letter Grade		Points Earned	Letter Grade		Points Earned	Letter Grade		Points Earned	Letter Grade
766	A+		687	B+		608	C+		529	D+
742	A		663	B		584	C		505	D
711	A-		632	B-		553	C-		474	D-

Students who enroll after the semester start date may be given additional time to complete the on-line quizzes and complete lab reports with data provided. Contact the instructor as soon as you enroll for details.

Required Textbooks and Course Materials

Background reading materials, lecture notes, lab protocols, and lab report questions can be accessed through the eLearning lecture course website. Quizzes and assignment submissions links are found in the eLearning lab website.

Students must download and subscribe to the Top Hat subscription service to answer in-lecture questions utilizing their phone (or some other electronic device with internet capability). The subscription service may be purchased through Top Hat directly or the University Bookstore.

Students must bring lab protocols to class as either a full-page hardcopy or a standard size laptop/tablet. Cellphones may NOT be utilized to access lab protocols (students who attempt to will be directed to leave the lab).

Class materials may be downloaded during the course, however, these materials are for registered students' use only. Classroom materials may not be reproduced or shared with those not in class or uploaded to other online environments except to implement an approved AccessAbility Resource Center (ARC) accommodation. Failure to comply with these University requirements is a violation of the Student Code of Conduct.

Course Policies

Covid-19 policy – We expect everyone to follow the current published CDC covid guidelines. Please do NOT come to class or lab if you have tested positive or are potentially contagious. Failure to act responsibly, severely jeopardizes the health, safety, and social plans of your peers, their family/friends, and the instructors.

If you are absent, you will need to get lecture notes from your peers. With appropriate documentation (typically lab results or selfie with at-home covid test) we will provide on-line data to complete lab reports.

Lecture/Lab Materials – Fill-in the blank lecture notes, background readings, lab protocols, and lab report questions for each lab topic will be available on the eLearning *lecture website*.

Lecture Participation – You will have the opportunity to earn points based on your participation in the lecture class as documented via use of your Top Hat response app. Students ***must*** be present in the lecture hall to receive credit. *Submitting Top Hat response while not in the lecture room will be considered an academic integrity issue.* Participation points will NOT be awarded if you fail to either bring or properly utilize your Top Hat app during lecture. Questions with a correct answer are worth 2 pts: 1 pt for responding and 1pt for answering correctly. Some questions do not have a correct answer and are only worth 1pt for responding. Students who earn between 70%-100%, 60-69%, 50-59%, 0-49% of the total possible Top Hat points will receive 30, 25, 20, or 0 course points.

Lab Quizzes and Lab Reports – Each experiment consists of an online pre-lab quiz (10pts) and a post experiment lab report (30pts). Lab report questions will be posted in the eLearning *lecture section*. All graded submission links including on-line quizzes will be posted in your eLearning *lab section*. All graded assignments must be submitted electronically through your eLearning *lab section* ***before*** your enrolled lab session starts. Your lowest 30pt lab report score will be automatically dropped from the final grade.

Lab Quizzes may be resubmitted multiple times for grading ***before*** the deadline. Late quizzes will **NOT** be accepted.

Lab Reports will be deducted 3 points for each 24-hour late period. Lab Reports over one week late will not be accepted.

The lab report formats will vary from week to week depending upon the type of experiment that was performed. Please do not waste your time writing "traditional" report sections or making tables/graphs that are not asked for in the lab report. In general, the format will be short answer questions, calculations, presentation of data, and applying the concepts type questions to current or new data. Reports must be **typed** (figures and calculations may be neatly handwritten and electronically embedded into your lab report). Lab reports will not be accepted from students who do not completely participate in the laboratory session.

The TA's are committed to grading consistently within their sections. If you notice a difference between grading particular questions, please bring them to the TA's attention. They have been instructed to readjust grades to the students' benefit. (i.e. No one will lose points for an Instructor or TA's error.)

You have **one week** from the time a graded lab report is returned to you to contest the severity of the grading by the TA. Except for clerical errors in the grade book, we will not consider changing the lab report grade after that week has passed.

Science is more than reading a book or performing a laboratory technique followed by filling in bubbles on a scantron or short answers on a lab report. Brilliant ideas are easily lost if they are not communicated clearly and concisely in a logical and accurate manner. If your lab report writing/presentation is confusing you may lose additional points from your report.

The lab begins with reading the background material, attending the lecture, and conducting the online pre-lab quiz BEFORE the upcoming experiment. It is important that you come to the lab with some basic knowledge of the experiment we will be performing.

Please, be on time to class! Tardiness is unprofessional and distracting to the instructors and your classmates. Part of your overall grade includes an "on time attendance" grade. Students who fail to arrive at the lab on time may miss important information and instruction on the safe and proper use of equipment and reagents. Those who do not receive this instruction could present a danger to themselves, others, and the equipment and therefore may be barred from participating in the experiment and turning in the corresponding lab report.

Switching Lab Sections - Attendance at a different lab section time is not allowed without prior approval of the instructor. Do not expect to be granted a "switch" at the last minute. *If you are given permission to attend another lab section, your previous lab report and your lab quiz are still due during your normally enrolled lab section - regardless of when your scheduled lab time is and when your switch lab time is.* Remember, students do not have the right to switch between lab sections. Switching labs is at the discretion of the instructor(s) and is not guaranteed. **Accommodation for absence due to religious observance should be brought to instructor's attention by census day as indicated on the UTD academic calendar.**

Missed Labs – There are no scheduled "make-up" labs in this course. If you miss a lab you cannot submit the lab report and will automatically receive a "0." Please remember that your lowest 30pt lab report score will be automatically dropped from the final grade.

Exams – Written exams will be conducted at the UTD Testing Center.

Testing Center Instructions:

- The Testing Center is located at 3020 Waterview Parkway, SP2 First Floor, Suite 11.175, Richardson, TX, 75080.
- Testing center hours and guidelines are found https://ets.utdallas.edu/testing-center/students
- Students MUST reserve their seat for testing at least 48 hours prior to the exam date.

- Students MUST present their PHYSICAL student ID Comet Card each time to be admitted to the test. If you do not have an UTD photo ID presently, please make arrangements to get one before the first exam. https://www.utdallas.edu/cometcard/cometcard/ No other form of identification is acceptable. A driver's license will not work as that does not have your student ID.
- Student must have the following information:
    - Course Prefix + Course Number + Course Section Number + Exam Name
    - Instructor's Name
- Use of a non-programable calculator is permitted during the exams. No other outside materials are required to take the exam. If the student violates this policy, an incident report will be filed and submitted to the instructor.
- Students are monitored while testing.
- Any accommodation required by the OSA will be honored at the Testing Center.
- **Students who do not make an appointment, miss an appointment, or do not complete the appointment registration process fully, will not be able to take the exam and will earn a 0.**

Student Conduct & Discipline

The University of Texas System and The University of Texas at Dallas have rules and regulations for the orderly and efficient conduct of their business. It is the responsibility of each student and each student organization to be knowledgeable about the rules and regulations which govern student conduct and activities. General information on student conduct and discipline is contained in the UTD publication, *A to Z Guide*, which is provided to all registered students each academic year.

The University of Texas at Dallas administers student discipline within the procedures of recognized and established due process. Procedures are defined and described in the *Rules and Regulations, Board of Regents, The University of Texas System, Part 1, Chapter VI, Section 3*, and in Title V, Rules on Student Services and Activities of the university's *Handbook of Operating Procedures*. Copies of these rules and regulations are available to students in the Office of the Dean of Students, where staff members are available to assist in interpreting the rules and regulations (SU 1.602, 972/883-6391).

A student at the university neither loses the rights nor escapes the responsibilities of citizenship. They are expected to obey federal, state, and local laws as well as the Regents' Rules, university regulations, and administrative rules. Students are subject to discipline for violating the standards of conduct whether such conduct takes place on or off campus, or whether civil or criminal penalties are also imposed for such conduct.

Academic Integrity

The faculty expects from its students a high level of responsibility and academic honesty. Because the value of an academic degree depends upon the absolute integrity of the work done by the student for that degree, it is imperative that a student demonstrate a high standard of individual honor in his or her scholastic work.

Scholastic dishonesty includes, but is not limited to, statements, acts or omissions related to the submission as one's own work or material that is not one's own. In general, scholastic dishonesty involves one of the following acts: cheating, plagiarism, collusion and/or falsifying academic records. Students suspected of academic dishonesty are subject to disciplinary proceedings.

In accordance with University regulations, we are obligated to investigate and refer potential scholastic dishonesty instances to the Dean of Students. We are not able to "handle it at our level." We urge you to protect yourself by reading the information located on UTD Office of Student Affairs website: http://www.utdallas.edu/deanofstudents/students/
Plagiarism, especially from the web, from portions of papers for other classes, and from any other source is unacceptable and will be dealt with under the university's policy on plagiarism (see general catalog for details).

Each student will be performing the same experiment and be assigned the same lab report questions. Good scientists collaborate with others. In general principle, we have no issues with students collaborating together. However, the analysis and reporting of all data and lab report answers is to be totally an individual effort. Examples of unacceptable collaboration include but are not limited to:

- Submitting Top Hat answers when not present in the lecture room.
- Copying another (current or former) student's lab report, homework, or extra credit work.
- Copying answers out of the lab manual or other sources (textbook/website) without appropriate quoting and referencing.
- Sharing a spreadsheet analysis of a data set.
- Copying another's answers during a quiz or exam.
- Changing a graded paper and requesting that it be regarded.
- Failing to turn in an assignment and then suggesting that the TA/Instructor lost it.
- Falsification of data.
- Presenting data, graphs, gels, or blots from another (current or former) student as if it was your results (unless explicitly permitted by the instructor).

Let us reiterate that scholastic dishonesty is a very serious offense and we will NOT tolerate it. While cheaters may not be concerned about intellectual honesty, our integrity is on the line if we suspect academic dishonesty and do nothing about it. *Suspicion of academic dishonesty WILL be reported to the Office of Community Standards and Conduct. We generally recommend a sanction of a zero for an assignment and/or an F for the course.*

Additional Topics

This course will follow all the rules and regulations as set forth by the University which can be accessed at the current UTD website (http://www.utdallas.edu). Please consult this website for additional important information concerning:

Student Conduct & Discipline	Student Grievance Procedures
Disability Services	Religious Holy Days
Copy Right Laws	Early Class Withdraw
Incomplete Grade Policy	Email Use

These descriptions and timelines are subject to change at the discretion of the instructors.