

Biochemistry Laboratory CHEM 3820 Section 1

Asst. Prof. John Latham

Email: john.latham@du.edu

Phone: 871-2533

Meeting time and location: Tuesdays and Thursdays 1-4:50 pm, SGM 209

Office: SGM 251 *ad hoc* meetings

TAs: **TBD**

Course Goals: This course will provide students the opportunity to learn and use modern biochemical techniques, to learn how to write a scientific paper, and to give a scientific presentation. Moreover, students will be provided an opportunity to perform an independently driven research project during the final four weeks.

Required Materials:

- Biochemistry Laboratory by Rodney Boyer
- Access to OneNote and the internet
- All other materials (handouts, lab manual, lecture videos, experiment videos) will be posted online at <http://portfolio.du.edu/lathamlab>

Grading:

- 1) **Lab Reports:** There are 4 lab reports due. All reports must be written in the format of a journal article (Abstract, Introduction, Materials and Methods, Results and Discussion, References). Follow the rubric.

You must write your lab report and analyze your data INDEPENDENTLY! If two reports are identical in any way, including the same figures, both get zeros. You must print the lab report. Do not submit it via email.

- 2) **Notebooks:** All notebooks will be kept on OneNote as part of the *Biochem Lab Class Notebook* using your Outlook 365 account. Notebooks should follow the rubric. An example notebook can be found in the Course Documents on the website. Notebooks will be emailed to your TA on the due dates. **You may use your tablet, smartphone, or laptop while running experiments. However, once these devices become distracting, they will be banned.**
- 3) **Pre-Labs:** Answers to the Pre-Lab questions will be turned in when you walk into class the day that they are due. Pre-Labs will not be accepted late (ie. 3 min after you walk into class or beyond). Pre-Lab questions will be based on lecture videos (posted on Canvas, website, and embedded into OneNote) and reading assignments.
- 4) **Lab Participation:** Be involved in lab and clean up when you are done. Participation is graded subjectively – so look (and be) busy. Participation points will be deducted if you are found to be on social media, playing games, excessively using iMessage, etc. Most importantly, it's hard to participate when you are not here...show up to class.
- 5) **Independent Projects:**
 1. **Group Plan (10 pts):** The Group Plan will be due on the first day of Module 4. Fill out the form provided to you.

2. **Updates (15 pts total, 5 ea):** Like the Pre-Labs, Updates are due as you step into the classroom. They will be individually graded – so *follow the Weekly Update Form!!!*
 3. **Report (50 pts):** This is a journal style paper that should be written independently but using all of the group data. You should fully understand what other members did. *Follow the Rubric!!*
- 6) **Exam:** The exam will be given in Week 7 and covers the theory and application of protein purification, characterization and fluorescence spectroscopy that will be covered in labs 1-4. The text, discussion questions, data analysis (including linear fitting of data), and journal articles posted on Canvas will be covered.
- 7) **Poster Presentation:** One formal group poster presentation over the projects will be done in March during the last week of classes. Details will be given in class. *Follow the Rubric.*

Grade Distribution

<i>Assignment</i>	<i>Points</i>
Prelabs (5, 10 pts each)	50
Lab reports (4, 50 pts each)	200
Independent Project Plan (10 pts), Updates (15 pts) and Report (50 pts)	75
Poster Presentation	50
Participation	50
Exam	100
Lab Notebook	25
TOTAL	550

Schedule

Biochemistry Laboratory Schedule

<i>Date</i>	<i>Day</i>	<i>Tasks</i>	<i>Due</i>	<i>Reading</i>
Module 1 – Protein Purification				
05 Jan 16	T	Lab 1A – Transformation		Intro, Lab 1 Intro, Lab 1A & S1
06 Jan 16	W	<i>Start overnight cultures and move plates to 4C (afternoon)</i>		
07 Jan 16	R	Lab 1A – Protein Expression	Prelab #1	S2, S3
08 Jan 16	F	<i>Spin and freeze bacteria pellets</i>		
12 Jan 16	M	Lab 1B*- Protein Purification	Prelab #2	Lab 1B
Module 2 – Protein Characterization				
14 Jan 16	W	Lab 2 – Protein Quantification	Prelab #3	Lab 2 entirety
15 Jan 16	F	<i>Turn in lab report by 5pm*</i>	Lab report #1	
19 Jan 16	T	Catch up day		
21 Jan 16	R	Project planning and pour gels for Lab 3		Independent Projects (pgs. 22-24)
22 Jan 16	F	<i>Turn in lab report by 5pm*</i>	Lab report #2	
26 Jan 16	T	Lab 3A – Gel Electrophoresis and Staining	Prelab#4	Lab 3 Intro, Lab3A
28 Jan 16	R	Lab 3B – Imaging and Analyzing Gel		Lab 3B
Module 3 – Fluorescence Spectroscopy				
02 Feb 16	T	Lab 4 – Group 1 – Fluorescence Measurements, Group 2 – Project Planning	Prelab#5, Lab Report #3	Lab 4 entirety
04 Feb 16	R	Lab 4 – Group 2 – Fluorescence Measurements, Group 1 – Project Planning		Lab 4 entirety
Module 4 – Independent Projects				
09 Feb 16	T	Independent project	Lab report #4, Project Plan	
11 Feb 16	R	Independent project		
16 Feb 16	T	Independent project, Lab exam (1h)	Progress update	
18 Feb 16	R	Independent project		
23 Feb 16	T	Independent project	Progress update	
25 Feb 16	R	Independent project		
01 Mar 16	T	Independent project	Progress update	
03 Mar 16	R	Independent project		
08 Mar 16	T	Practice poster session		
09 Mar 16	R	Check out	Lab report #5	

* = Long day!

** = only read 6B through page 186. I will not cover nucleic acid gel electrophoresis.