

██████████ Biological Chemistry Lab I and II

Course Instructors
██████████
██████████

Intern Instructor: ██████████

Fall 2013 – Meeting Times and Places

Lecture	Friday 2 – 2:50 PM	██████████
Lab	Tue, Wed, or Thurs 2 – 6:00 PM	██████████

Office Hours

TAs:	Monday 3:00 PM	██████████
	Friday 10:00 AM	██████████
Professor	Friday 3:00 PM	██████████

Spring 2014 – Meeting Times and Places

Lecture	Monday 12 – 12:50	██████████
Lab	Tue, Wed, or Thurs 2 – 6:00 PM	██████████

Office HoursBy appointment with TAs and Instructors

Teaching assistants (TAs)
██████████ ███████████ ███████████

Required materials (both semesters):

- Text: *“At the Bench:...”*.
- This lab manual
- Lab Notebook: Carbon-copy capabilities and duplicate numbered pages (you will use the same notebook for both semesters) (See your TA if you are interested in a “used” notebook.)
- Materials provided on ██████████ site

Syllabus for CHEM 4411 – Fall 2013

<u>Date</u>	<u>Material</u>	<u>Instructor</u>
Aug 30	<u>Class time material</u> : Lab manual pages 7-19 and 26-39; Introduction to the course video [REDACTED]; 9:50); <u>Class time activity</u> : Concept mapping <i>and</i> literature searches	[REDACTED]
Sep 3-5[§]	<u>Laboratory material</u> : Chapters 1 & 2; Campbell.pdf (collab); How to use a pipette video (BioLEd; 12:49); general safety video (BioLEd; 2:24) <u>Lab: 1A</u> : Pipetting fundamentals <u>1B</u> : Literature searches and electronic resources	TAs
Sep 6	<u>Class time material</u> : Lab manual pages 40-48; CREATE method paper (Hoskins et al, Genetics Education, 2007(176):1381-1389); read and prepare Steps 1- 3 of the CREATE method with Koma <i>et al.</i> paper (<i>Appl Microbiol Biotechnol</i> 2008(79):775) (Lab manual pages 40-48) <u>Class time activity</u> : Diagramming and analysis of data in published manuscripts	[REDACTED]
Sep 10-12	<u>Laboratory material</u> : Koma <i>et al.</i> paper (<i>Appl Microbiol Biotechnol</i> 2008(79):775) and your POI specific paper(see table pages 45-46) <u>Lab: 2</u> : Primary literature	TAs
Sep 13	<u>Class time material</u> : Lab manual pages 49-55; Chapter 1 & 2; LabFax 5.pdf (collab), Preparing solutions mini-lecture (BioLEd; 12:40) <u>Class time activity</u> : Buffer calculations	[REDACTED]
Sep 17-19	<u>Laboratory material</u> : How to use a balance video (BioLEd; 9:44); How to prepare and pH a buffer video (BioLEd; 4:01); How to calibrate a pH meter video (BioLEd; 2:54) <u>Lab: 3</u> : Buffers and solutions	TAs
Sep 20	<u>Class time material</u> : Lab manual pages 56-68; Chapters 3, 10 & 12; lactate dehydrogenase mini-lecture (BioLEd; 3:44) <u>Class time activity</u> : Kinetic assays; experimental design	[REDACTED]
Sep 24-26	<u>Laboratory material</u> : Chapters 3, 10 & 12; Spectrophotometer video (BioLEd; 4:52); How to use a spectrophotometer video (BioLEd; 1:32) <u>Lab: 4</u> : Kinetic analysis of an enzyme – lactate dehydrogenase	TAs
Sep 27	<u>Class time material</u> : Lab manual pages 69-79 and 89-95; Enzyme Assays1.pdf (collab); Enzyme Assays2.pdf (collab); Michaelis Menten kinetics and inhibition mini-lecture (BioLEd; 11:13) <u>Class time activity</u> : Enzyme kinetics and data analysis; general cloning and transformation	[REDACTED]
Oct 1-3[§]	<u>Laboratory material</u> : Enzyme Assays1.pdf (collab); Enzyme Assays2.pdf (collab); How to have good sterile technique video (BioLEd; 2:18); Bacterial transformation videos	TAs

	(BioLEd; 2:29 and 4:45); How to plate bacterial transformation video (BioLEd; 1:57) <u>Lab: 5:</u> Enzyme kinetics and data analysis <u>7A:</u> General cloning methods and transformation	
Oct 4	<u>Class time material:</u> Lab manual pages 80-88; Mazumder.pdf; Protein data bank video (BioLEd; 3:00); mini-lectures TBA <u>Class time activity:</u> Bioinformatics tools and methods II	
Oct 8-10	<u>Laboratory material:</u> Mazumder.pdf; BLAST video (BioLEd; 7:56) <u>Lab: 6:</u> Computational Biology: Bioinformatics tools and methods	TAs
Oct 11	NO LECTURE	
Oct 15-17	NO LABS – Fall Reading Days	
Oct 18	<u>Class time material:</u> Lab manual pages 96-105; Chapters 6 & 13; Cloning and expression vectors mini-lecture (BioLEd; 10:00); Recombinant DNA and protein production video (BioLEd; 4:36); Protein SDS-PAGE video (BioLEd; 2:07) <u>Class time activity:</u> Recombinant protein expression and SDS-PAGE	
Oct 22-24	<u>Laboratory material:</u> How to use a centrifuge videos (BioLEd; 3:17 and 1:38); How to run an SDS-PAGE gel video (BioLEd; 4:43); How to stain an SDS-PAGE gel video (BioLEd; 5:46); How to streak a plate videos (BioLEd; 4:18 and 1:56) <u>Lab: 7B:</u> Recombinant protein expression and SDS-PAGE	TAs
Oct 25	<u>Class time material:</u> Lab manual pages 106-119; How to prepare a column (general) video (BioLEd; 1:20) <u>Class time activity:</u> Chromatography	
Oct 29-31[§]	<u>Laboratory material:</u> Chapters 5, 7 & 8 <u>Lab: 8A:</u> Gel Filtration Chromatography <u>8B:</u> Ion Exchange Chromatography	TAs
Nov 1	<u>Class time material:</u> Lab manual pages 120-130; Affinity chromatography mini-lecture (BioLEd; 13:08); Affinity chromatography video (BioLEd; 0:45) <u>Class time activity:</u> Chromatography and dialysis	
Nov 5-7[§]	<u>Laboratory material:</u> Chapters 5, 7 & 8; dialysis overview (collab) <u>Lab: 9A:</u> Affinity Chromatography <u>9B:</u> Dialysis	TAs
Nov 8	<u>Class time material:</u> Lab manual pages 135-146; Chapters 4 & 11; BioRad assay (collab) <u>Class time activity:</u> Quantitative determination of protein concentration and protein-ligand binding	
Nov 12-14	<u>Laboratory material:</u> Chapters 4 & 11; BioRad assay (collab) <u>Lab: 10:</u> Quantitative determination of protein concentration and protein-ligand binding	TAs

Nov 15	<u>Class time material</u> : Lab manual pages 149-162; ClustalW multiple sequence alignment video (BioLEd; 5:06), mini-lectures TBA <u>Class time activity</u> : Computational biology II: Molecular visualization, modeling, & docking	
Nov 19-21	<u>Laboratory material</u> : Punta.pdf (collab); PatchDock.pdf (collab) <u>Lab: 11</u> : Computational biology II: Molecular visualization, modeling, & docking	TAs
Nov 22	<u>Class time material</u> : Bring a print out of your figures and your computer to edit your figures <u>Class time activity</u> : Data and figure clinic	
Nov 26-28	THANKSGIVING BREAK	
Nov 29	THANKSGIVING BREAK	
Dec 3-5	<u>Laboratory material</u> : POI relevant literature; bioinformatics materials <u>Lab</u> : Check-out and clean lab; assembly of POI data (<i>POI report due at 2:30 on Friday, December 6; see page XX</i>)	TAs
XX DAY December XX, 2013, 2-5 PM: Final Exam		

[€]BioLEd is the Biochemistry Lab Education Resource (<http://biochemlab.org/>)

[§]Be sure to do the pre-lab assignment for both labs;

*Lecture **will** meet on 8/30

[†]No lecture on 10/11

At-a-glance due dates for pre-lab assignments, assignments, and reports

Week	Assignment(s) Due this Week	Pre-lab Assignments		Assignments and Reports
		Sunday 8:00 pm	At the start of Lab	At the start of lab
8/25				
9/1	Pre-labs 1A and 1B; Steps 1-3 in lab 2 for lecture on 9/6 (see page XX).	1A (p 37 on 9/1)	1B (p 30)	
9/8	Pre-lab 2; Labs 1A and 1B assignments		2 (p 47)	Labs 1A and 1B assignments
9/15	Pre-lab 3; Lab 2 assignment	3 (p 53) on 9/15		Lab 2 assignment
9/22	Pre-lab 4; Lab 3 assignment	4 (p 61) on 9/22		Lab 3 assignment
9/29				
10/6	Pre-lab 6	6 (p 81) on 10/16	6 (p 81)	Kinetics Report (Labs 4 and 5)
10/13	FALL READING DAYS			
10/20	Pre-lab 7B; Kinetics Report; Lab 6 assignment		7B (p 99)	Lab 6 assignment
10/27	Pre-lab 8A and 8B	8A (p 110); 8B (p 116) on 10/27		
11/3	Pre-lab 9A and 9B	9A (p 122), 9B (p 128) on 11/3		
11/10	Pre-lab 10; Protein Expression/Purification Report	10 (p 141) on 11/10		Protein Expression/Purification Report (Labs 5B, 7-9B)
11/17	Pre-lab 11; Protein Concentration/Ligand Binding	11 (p 159) on 11/17	11 (p 159)	Protein Concentration/Ligand Binding Report (Lab 10)
11/24	THANKSGIVING			
12/1	POI Report			POI Report at 2:30 pm on 12/6
12/8				Final Exam on XX, December, XX, 2-5:00 <div style="background-color: black; width: 100px; height: 15px; margin-top: 5px;"></div>

Organization of Biochemistry I and II labs

The first semester of this course is designed to introduce you to methods used in biochemistry. You will learn these methods while studying a protein of interest (POI) assigned to you. Unlike previous lab courses, pre-canned protocols will not be provided. This laboratory is designed for you to learn to explore, research, and investigate science **independently**. You are expected to read textbooks, literature, and instructions before lectures and lab sessions. The lab and lecture are designed to help you teach yourself – they are not intended to passively feed you information.

For the second semester (██████████), you will be studying the function of your POI. All of the material you study this semester is relevant to the second semester. **This manual and the data you acquire are the information that you will heavily rely on in the second semester.** Since each protein is different, the experiments for each will be different. In the second semester, you will design and execute your own experiments; you will also need to do troubleshooting of those experiments to make progress. Finally, you will analyze your data and, with the knowledge you have about proteins similar to yours, design a second set of experiments for that POI.

Essentially, you will become an expert on your POI, a protein which has a crystal structure, but that has never been studied for function! This is true research, unlike the experiments generally performed in undergraduate teaching labs. Any characterization you are able to perform for your POI should be considered as genuine scientific progress (such as in the publications you read).

Proteins of Interest (POIs)

Accession #	PDB ID	Putative function	Organism	TA*	Advisor*§
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*See page 6 for contact information. ██████████

Performing research of this sort is an excellent way to learn how to approach a question scientifically. However, because it is truly original research, results are not guaranteed. **Your grade will not rely on you getting specific data!** However, regardless of how well your experiments work, you will be responsible for making reasonable and logical choices in your approach and for making a concerted effort to move your project along. If you have a question, try to answer it yourself (consult literature or an online database, look in the manual, ask a

labmate, Google search, etc.). When you feel you have exhausted your resources, you should ask your TA or the instructor. **Be prepared to explain where you have looked for the information, and why it seems difficult to find.** When you want to understand or clarify a point in the literature and textbook search an alternative reference before coming to your TA and be prepared to explain what additional sources you have sought. This is to encourage resourcefulness and independence, not to avoid you. See Email policy page 17.

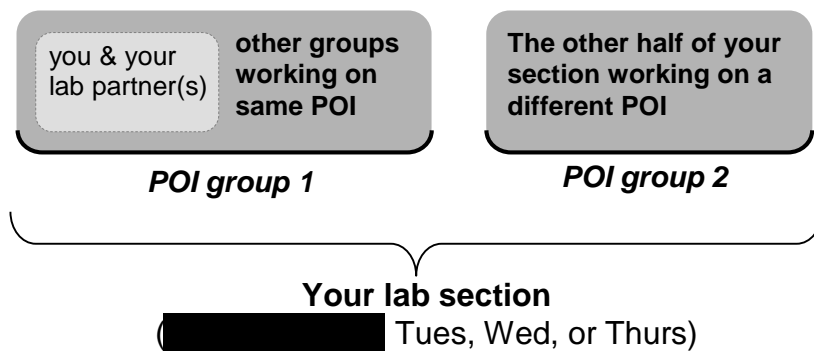
General tips for success in any laboratory

- **Always look at your solutions before you use them.** You may be surprised what buffers will support microbe growth. Working with contaminated buffers will not yield good results, and any positive results you may get may not be reproducible. It is far less time consuming to prepare fresh buffers early in the experiment than to have to repeat an entire experiment.
- **Use your time wisely.** It is rare that you will have nothing to do while waiting for an incubation or centrifugal spin. You can always be preparing buffers for the next step, or labeling tubes, or planning your next step. While it may be tempting to socialize during the lab period, there is probably not much true “down time”.
- **Pay attention to how the lab is organized and make every effort to maintain that organization.** There are roughly 45 students using each laboratory [REDACTED]. And many times, the 45 students in the one room will need to borrow materials from the other lab. This means that if things are not put back where they were found, it will quickly become very difficult for anyone to find what they need. It is in your best interest to keep things where they can be found. Time spent hunting for a chemical or equipment is time wasted. Maps of the labs are included in this manual.
- **Please tell your TA or make a note if you notice that chemicals or supplies are running low.** There are hundreds of things in the laboratory and it is not reasonable to expect your TAs to keep track of everything. This is how it works in a research lab. If you run out of a chemical, it takes time to place the order and receive a replacement. That delay can be avoided if you **check ahead of time for the chemicals and supplies you need and request more before you run out.** This is especially important for the second semester.
- **Dispose of waste properly.** This is the responsibility of everyone who shares the lab space. There are separate waste containers for 1) HAZARDOUS waste (in the hood), 2) for glass waste, 3) for gels, and 4) for regular trash. Please be sure to use the correct container.
- **Use the chemical inventory.** There are binders which contain the inventory of the chemicals available in both [REDACTED]. This inventory is also posted on Collab, and efforts will be made to keep it up to date; however, your help is required for this. Place empty chemical bottles in the designated space in the lab (near the chemicals in a plastic tub) so that they may be removed from the lab inventory and the inventory kept up to date.
- **Study the lab manual/protocol.** There is a lot of information in this manual. Reading it the hour before the lab is not going to help you prepare for the lab. You should be planning to spend a couple hours the day before your lab reading the materials here and preparing your plan for the lab. While there are pre-lab assignments for most of the labs, you may choose and/or need to do MORE than what is required in order to be prepared and organized for the lab.

- **Use additional resources.** This lab manual is not exhaustive! Nor is the hour-long lecture enough time to encompass everything there is to know. There is much more information to be found in the literature, textbooks, and the suggested laboratory readings.
- **Plan your experiments ahead of time.** Again, this lab manual is not exhaustive! You will not be told at every step how much of a specific buffer to prepare, or what to dialyze your protein in, or how many tubes to label (or even what kind of tubes!). This course is designed to teach you not only biochemistry laboratory methods, but also how to conduct research. You will be expected to plan out your experiments more than you may have in other courses. This means you will determine how much buffer to make, how many tubes to use, and what type you need. Plan ahead and plan to spend a fair amount of time on this before the lab period. This time spent outside of the lab will be very worthwhile.

How this laboratory course is different

- You will be required to spend additional time in the laboratory outside of your 2:00 – 6:00 p.m. time. This is unavoidable in biochemistry. The times that you are required to come in are short and can be divided up between lab partners and, later in the semester and second semester, lab group. If there is a true scheduling problem, be sure to document that with your TA and make arrangements with them. This should be very rare! You are expected to make every effort to meet the requirements for your experiments.
- Lab partners/lab groups: There are 2 proteins of interest (POI) assigned to each laboratory section. There are up to 6 sets of lab partners in each section, which means that there are 3 sets of partners working on each POI. You will work with only your lab partner(s) for the first semester. In the second semester you may work cooperatively with your lab group (~4-9 people studying the same POI).



- In the second semester, extra time in the lab should be expected and a schedule will be provided with the times that TAs will be available in the lab.
- Unlike many labs, your station will not be stocked with *everything* you will need. Because the laboratories are used for 3 sections and many solutions and buffers you make will be used from week to week, you will be using additional glassware that is stored centrally. Solutions you make that you will need in subsequent weeks can be stored in your station or somewhere in the lab agreed upon with your TA. **Please be sure to clean glassware thoroughly before returning it to the shelves. Also, be aware that your experiments can be adversely affected by dirty glassware. You should also clean glassware before using**

it. Always rinse your glassware with dH₂O several times before use. In other words, ASSUME ALL GLASSWARE IS DIRTY until you clean it!

- The second semester of this course relies heavily on the methods learned in the first semester. You will want to understand them thoroughly and be able to design an experiment like them should you need to. Trying to merely get through the semester will not serve you well in the second semester. You should think of this as a year-long course, as your TAs and instructors do.

Lectures

Plan to bring your laboratory notebook and this lab manual to **all** lectures. Lectures will be both standard lecture formats and more interactive formats. Attendance is highly encouraged. You should come prepared to participate in the discussion.

Laboratory sessions

Laboratory sessions begin promptly at 2 PM and conclude at or before 6 PM. Do not plan anything else during this time, hoping that you will finish lab early. Also, **you will not be allowed to stay past 6 PM**; you must plan ahead and organize so that you can leave on time.

If you have a laptop, you may bring it to the laboratory session, but all data needs to be recorded in your laboratory notebook (see Lab notebooks below). The more prepared you are, the smoother lab will go. If you do not have your notebook, you will not be able to complete the lab. Your pre-lab write-up, which is different from the pre-lab assignments, should be in your notebook (see Pre-lab write ups and Pre-lab assignments).

Missing Lab

Missing laboratory is not acceptable. In the case of Job/Professional school interviews, you must contact your TA and laboratory partner two-weeks ahead of the missed laboratory and the TA will work with you and your partner to reschedule the laboratory. The rescheduled time must be within the same week as the missed laboratory. In addition, please provide the TA proof of the interview (*e.g.*, forward the invitation email). If you miss a laboratory because you are sick, you must email your TA and laboratory partner 24 hours in advance and provide a signed letter from Health Services. If you miss a laboratory, and do not notify your TA and laboratory partner in advance you will not receive credit for the laboratory and all associated assignments.

Teaching assistants

Treat your TA with the utmost respect, and act in a professional manner at all times. If you are frustrated, then most likely your TA is too. State your concerns in clear and respectful language. Your TA is in charge of evaluating your laboratory performance, and, after discussion with the professor, will grade your overall performance in the laboratory (see grade breakdown on page 17). The 100 points is based on your demonstration of respectfulness, laboratory practice, cleanliness, timeliness, responsibility, and contribution to your partner/group.

Lab notebooks

Lab notebooks are **required** in this course. The laboratory notebook is an extremely useful tool for record-keeping and is essential for accurate performance in the laboratory. The notebook must be a permanently bound record book and have carbon-copy capabilities and duplicate numbered pages. All records must be kept in permanent ink. Neatness in the notebook is critical to laboratory technique. The notebook should not only be intelligible to the student, but also to any trained biochemist who could repeat the work or complete an unfinished experiment.

Original data must not be altered by erasing or using correction fluid. If an error in calculations or data observations is made, correct the data by drawing a single line through it. Be sure to explain why the data was excluded.

The record book should also contain a table of contents and numbered pages. The date performed should also appear on each data page. Observations made during the course of an experiment should be recorded to help interpret results.

- Record all buffer and sample preparations and all procedures conducted
- Enter data in a clear and organized manner. It is useful to set up the data page collecting data.
- Clearly label all entries (including units).
- Fill in the data in chronological order.
- When instruments are used, record the brand and model number. It is also important to record dial settings for any conditions on the instrument which can be changed.
- Affix all graphs, spectra, etc., in the notebook.
- Show at least one calculation for each manipulation involved in your calculations.

Pre-lab assignments

You must come to lab prepared with your lab notebook, completed pre-lab assignments, pre-lab write-up, calculator, etc.

There are specific pre-lab assignments which need to be emailed to your TA by 8 PM the Sunday before your laboratory session or will be due when you arrive in the lab. These specific pre-lab assignments are described in each laboratory in this manual and the due dates for these are summarized in the table on page XX. You need to plan ahead because pre-lab assignments can be time consuming.

Pre-lab Write-Ups

Pre-lab write-ups must be written **neatly** in your notebook. Even though this portion is not graded, the TA will check and initial your notebook each week to be sure the pre-lab write-up is completed. If your pre-lab is not done, you may not be allowed to complete the lab. The pre-labs help you prepare for lab. If you complete them, the quizzes should be no problem for you. Pre-labs should include the following:

1. Procedure: A timeline of tasks to be completed in this lab. Estimate the time it will take to do each task to the best of your knowledge and in what order you should do each task. *Remember:* You do not have to proceed in the same order listed in the instructions unless otherwise stated. Make notes of things that need to be prepped ahead of time (e.g., turning on the water bath for gel running).
2. Reagents: List and estimate the amounts of each reagent you will need during the lab.
3. Equations/Calculations: List any equations needed for each lab and perform as many of the calculations as possible before you come to lab. For example, concentration and dilution calculations will come in handy if they are done beforehand.
4. Any additional information requested in the manual.

Pre-lab quizzes

There will be a brief quiz (~five minutes) every week before the start of lab. This quiz will be an assessment of how well you are prepared for lab and will cover the reading material, videos assigned, and pre-labs. You cannot start lab until you've completed and handed in your quiz and your TA has presented the lab for the day.

How to Submit on [REDACTED]

In addition to a paper copy, all assignments and reports should be submitted using [REDACTED]. All submissions should be in pdf format (see Submission Policy below). If the paper copy is accidentally misplaced and the assignment is not on [REDACTED], you will not receive credit for the assignment.

To submit an assignment on [REDACTED]

1. Navigate to the course tab.
2. Select assignments on the left-hand bar.
3. Click on the assignment you wish to submit.
4. Add attachments using the "Add Attachments" button.
5. You may append some general comments in the submission text box if there is some information you wish to convey to the TA/instructor.
6. Click the submit button to turn in the assignment. You will receive a confirmation to your UVA email stating successful receipt of the assignment by [REDACTED]
7. **IF YOU DID NOT GET THE EMAIL THE ASSIGNMENT WAS NOT SUBMITTED PROPERLY!**

Submission Policy

In addition to a paper copy turned in when you arrive at the lab, all assignments should be submitted in PDF form on [REDACTED]. Software suites such as the more recent versions of Microsoft Office, as well as Open Office (free) or LibreOffice (free), are capable of saving documents and spreadsheets into PDF format directly (File -> Save As Type -> PDF). If you do not have a

recent version capable of converting files to PDF there are some free online converters available (i.e., <http://www.freepdfconvert.com/>) which should be able to convert your file.

Also please note that all submitted assignments should include the title of the assignment on the front page, and your name, your TA's name, and the date at the end of the document. We print the assignments in batch and the printout is no longer associated with your email.

Late Policy

Late assignments are not acceptable and will not be considered. All assignments need to be uploaded on [REDACTED]. The dates on [REDACTED] may be misleading because the open date will be 24 hours before the first lab sections' assignments are due and the closed date will be the time and date that the last lab section's assignments are due. If you are unsure of a due date and/or time, please be sure to clarify it with your TA *in advance*.

Re-grade Policy

If you think an error has been made in grading your assignment, you should hand the assignment to the instructor **with a type-written description outlining the error** stapled to the front. The entire assignment will be re-graded. Therefore, it is certainly not guaranteed your grade will change and it could possibly be lower than the original grade. Your TA will hand the re-grade back to you with the final decision written on the front.

Email Policy

In the past, there have been serious issues with flooding TAs and instructors with emails. **You should not email your TA or instructor more than twice a week.** Your advising instructor should be copied on all emails between you and your TA. Your TA or instructor cannot be expected to answer immediately and typically will need at least 24 hours to reply. Instead of email, we encourage you to post on the [REDACTED] *Discussion Board*; effort and participation in the course is partially assessed by contributions and postings of questions on the [REDACTED] *Discussion Board*.

Do not email your assignments to your TA. They must be submitted via [REDACTED] and handed in at the start of class. If the TA does not have the **completed** work for one reason or another (past reasons include: failure to press 'Send', forgotten attachment, missing sections), then you will receive no credit (see above *Late Policy* section).

How to set your account to receive email notifications from [REDACTED]

In the past, students have missed out on valuable information by not adjusting their settings on Collab to keep them informed. You should be sure to visit [REDACTED] often to ensure you have the latest and most complete information. To set your account to send you email notifications whenever a new question is posted, follow these steps:

1. Log in to Collab and this course.
2. Go to Discussion and Private Messages

3. Click on My Profile (along the top)
4. Scroll down to preferences and click yes on for all the questions.
5. Click on submit at the bottom.

You will get an email for all new questions but you will have to follow the directions below if you want all responses to be sent to you as well.

How to follow a Discussion on [REDACTED]

1. In Collab, click on Discussions and Private Messages on the left.
2. Click on the discussion topic you are interested in.
3. Above the word "Message," which is above the actual message, click on "Watch" (this is next to the binoculars).
4. If you reply to a message and want to watch that discussion thread, check the box next to "*Notify when a reply is posted*" at the bottom of the reply window.

Your POI specific Discussion section is only open to the POI group members. The other students and groups do not have access to read or contribute. So be sure not to post general questions in POI Discussions

You must do this for each discussion thread of interest. (There is no option to ‘watch-all’.)

Computer Issues

Computer problems should not hinder you from completing assignments. While a computer issue itself is very stressful, it is even more stressful if you have assignments that suffer because of it. Take steps to ensure that if you do have a problem with your computer, your work is safe.

Save your work early and often. **You should also back you work up somewhere in addition to your computer.** One convenient option is to open a dropbox account (<https://www.dropbox.com/>). Saving your work here will allow you to access it from any computer with internet service. Should you have computer problems, your work is still safe and accessible. A benefit of this is that you can also share files with others in your POI group.

Other options are available and the choice is yours. However, computer issues are not a valid excuse for late work.

Lab stations

You will be assigned a lab station for the remainder of the semester/year. It is important that you do not use supplies from other lab stations, even if that station is empty. The contents of your station are listed on page 20.

Laboratory safety policy

- All students must follow safe laboratory practices [REDACTED]
- **Wear proper attire.** You will **not** be allowed to be in the laboratory with open-toed shoes, skirts, or shorts.

- **Goggles are absolutely required.** You will get one warning to put your goggles on. Lab coats are not necessary unless otherwise stated.
- If you do not follow these safety rules you will be asked to leave. This is not negotiable. Please do not put your TA in an awkward position by disregarding these rules.

Equipment

If you encounter problems with the equipment, including the pipettes, notify your TA immediately so he or she can attempt to fix the problem.

Before leaving lab

After you finish your experiment, please make sure to:

- Clean your station (e.g., refill pipette tips and distilled H₂O bottles as necessary)
- Empty waste into appropriate containers. If you are not sure what is collected as waste or where to put your waste, ASK!
- Check out with your TA. TAs will have a sheet which they will initial when you are clear to leave. We have had to institute this policy because we have had some students leave early without cleaning up or leaving early and counting on their lab partners to finish up.

Honor Policy

We trust every student in this course to fully comply with all of the provisions of the [REDACTED] as well as the following policies specific to this course.

- When given permission to collaborate with others, do not copy answers from another student.
- Always cite any resources or individuals you consult to complete an assignment.
- All suspected violations will be forwarded to the [REDACTED] and, at our discretion, you may receive an immediate zero on that assignment regardless of any action taken by the [REDACTED]

Please let us know if you have any questions regarding the course honor policy.

If you believe you may have committed an [REDACTED] For your retraction to be considered valid, it must, among other things, be filed with the [REDACTED] before you are aware that the Act in question has come under suspicion by anyone. More information can be found at [REDACTED]

[REDACTED]