

The University of Texas at Austin
BIO160L – Immunology Laboratory
SPRING 2013

Labs: BME 2.310

W 2:00 - 5:00 PM (50175)

W 6:00 - 9:00 PM (50185)

Th 2:00 - 5:00 PM (50180)

Th 6:00 - 9:00 PM (50190)

Instructor:

Dr. James Bryant

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Phone: 232-6491

Email: jbryant@austin.utexas.edu

Office Hours: TBA,

Please email 3 or 4 days & times which are convenient for you to meet, after you have checked my available schedule on Bb. I can then select the earliest convenient time to schedule an appointment.

Teaching Assistants:

T.B.A.

Course Summary:

This is a practical Immunology laboratory which supports and builds on the immunology course BIO360K.

This course highlights **research principles** and emphasis is given to **understanding** of research and laboratory methodologies; above memorization. This course is centered on critical thinking, the systematic approach to problem solving and course work.

The course is designed to highlight both historical and current biological tests which are currently, or have been, important for diagnostic purposes in pathology laboratories to identify and understand immunological disease states. The principles covered highlight techniques and methods available for assessing disease states and addressing research questions within the immunological arena. The course is designed to help students integrate information they have acquired from their immunology, and biology courses, within the applied arena.

Course Objectives:

The course is designed to promote **critical thinking and problem solving skills**, to enable students to understand research methods and the commonly used diagnostic tools within the immunological world. Following the course, students will be able to design immunological experiments, troubleshoot experiments, present and interpret experimental results.

During the course students will learn to review biological and general literature, with a mind to critical evaluation of the experimental design and results. Students will acquire an appreciation for the limits of experimental techniques; appreciate the time involved within experimentation and the imperfections and errors innate within experimentation.

Course Content & Teaching Style:

This course is designed to guide students along the path toward self-sufficiency within the lab and thinking about immunological research projects. In order to succeed in the course and master the material, students should **expect** not only to **review the material** covered, but should also be willing to engage their **problem solving** and **numeracy** skills.

Students should be aware, that although this is only a 1 credit hour course, this is a rigorous course and in order to successfully pass the course students **must** be willing and able to commit the necessary **time** and **effort** to the material. Students should note that the lab sessions are schedule for 3 hours and the lab sessions will take the full scheduled 3 hours to complete.

Students who are willing to invest the appropriate time and thought into the course should excel, on exams and overall within the course. Students who are unable, or unwilling, to actively participate in the course or who fail to complete the course material should expect not to pass the course.

General policies:

- Please feel free to direct any questions to the instructor or TAs during office hours or to **request an appointment by email – just provide 3 or 4 days and times that work for you, based upon your instructors teaching schedule on Bb.**
- Please avoid asking questions of the instructor or TAs **just prior** to the day's exercise, as the labs require considerable preparation on the days of the class.
- Due to the organization of the labs and resources, it is **not possible to make up missed labs**. If you are unable to make the lab, be sure to get the raw data from another student in the class, but remember that **late reports will not be graded for credit**. Note that missing labs seriously damages student performance on exams and within the course.
- Although data for exercises may be obtained from group work, **reports should be hand written and prepared individually**. Plagiarism or cheating on reports or exams will be reported to Student Judicial Services.

Required Items:

- Lab protocols **MUST BE READ & UNDERSTOOD PRIOR TO EACH LAB SESSION**. Comprehension & understanding of each protocol & predicted experimental results will be assessed by quiz prior to each lab.
- The manual for this lab “Exercises in Immunology” will be available at Speedway Printing, Dobie Mall (512-478-3334).
- Students will also need a lab coat or smock, a Sharpie permanent marker & about 12 slides and cover slips.
- Students may also like to have a calculator available. However, these are not essential.

Blackboard (Bb):

Announcements, course material, problem set keys, grades and discussion boards are available on the BIO160L Blackboard site (<http://courses.utexas.edu>). **Students are expected to check Bb., on a daily basis.**

Students are encouraged to post any questions or answers to other student’s questions, to the discussion boards on Blackboard; to help everyone better understand the material. Students are also encouraged to post suggestions and feedback to improve the course for the benefit of everyone.

Emails:

Students are expected to **check emails on a daily basis.**

Students who do not receive an initial email, through Bb, from their instructor within the first class week should immediately contact their instructor, regarding the problem.

Students are free to email their instructor with questions or to schedule an appointment.

IN ALL EMAILS INCLUDE:

1. “BIO160L” as the first word of the subject line, or your email will not be delivered due to spam filtering restrictions.
2. A description of the purpose of the email in the subject line; e.g. “BIO160L meeting request”.
3. Your full name, course & section number at the end of your email.

Your instructor receives a huge volume of emails and if you do not include all pertinent information your email, your email will go unanswered.

Abuse of Bb & Emails:

Do not send group emails, unless the emails have been approved by your instructor & are course related. Students who use Bb or UT facilities in an inappropriate fashion will be referred to Student Judicial Services.

Requesting Appointments:

Your instructor meets a large number of students, when requesting a meeting by email always provide: **4 day and time ranges based upon your instructor's teaching schedule** and which are convenient for you. Your instructor's schedule is posted on Bb.

It is unlikely your instructor will be able to schedule meetings with less than two days notice and no meetings will be scheduled two days before or after an exam.

Individual student meetings are scheduled for 30 minutes. However, if there are more than 3 students within a group meetings can be scheduled for 1 hour, upon request.

Lab Sessions:

Lab sessions will be held on Wednesdays and Thursdays. Students must only attend the lab session for which they are enrolled. Students will be randomly assigned into pairs or small groups to work on the 'in class' lab sets. Groups will be randomized periodically over the course of the semester, in order to allow students the opportunity to meet and work with their colleagues and to experience a broad array of perspectives.

The labs are formally scheduled for 3 hours and will take the complete 3 hours. The *lab*, *TAs* and *instructor* **are available outside of these hours** to help with the course material. Please check the schedule for lab availability.

Please note that we share these facilities with other lab classes, some of which use infectious agents or have other general hazards you may not be expecting. **Assume that EVERYTHING in the lab is contaminated & CLEAN YOUR BENCH**, this will help to protect you from becoming biologically or chemically contaminated.

Students taking the first lab section of BIO160L (50020) should note. The first lab session is typically the largest & busiest of the three sections. The first lab session is the **longest session** of the day and tends to **overrun** the allotted time. If there are going to be any problems with reagents, equipment, things not working, or other general acts of god, they will typically occur within this session.

Please note the **LAB RULES** at the end of the syllabus.

Access to BME & Proximity ID Cards:

Students will need after-hours access to BME for this course. Students should check that their UT ID card functions as a proximity card. A list of EIDs is available if you are unsure if your current UT ID card is a proximity card.

If your current student ID card is not also a proximity card – you can obtain a proximity card from the ID center in the FAC 2nd floor. You will need to take your current ID card and another form of identification, such as a driving license.

Students who enroll in BIO160L after 1/14/13 will need to email their instructor their full name and EID in order for their names to be added to the after-hours access list.

Office Hours & Study Groups:

Students are encouraged and are welcome to make an appointment with their instructor, through email.

Scheduled office hours will be arranged during the first week of class.

Your instructor will schedule routine weekly study groups to answer questions and review assignments and exams.

Grading Policies - OVERVIEW:

Student's grades are solely determined by the willingness of **student's to engage** in the course. ALL students can achieve an A in this course; should the student be willing and able to sufficiently **engage** in the course and **seek help from the instructor as required**. Students, who do not do well in the course, either have not been willing to engage in the course, have other factors which compete for their time, or **do not seek assistance with problems "early" enough**.

To emphasize that students are earning their grades, submitted work will be graded by awarding points for answers which are correct. Errors and omissions will be noted with brief comments on the graded work. **Submitted work is graded as if it has zero value and points are awarded for students tangible contributions** to answering the problem sets.

Student performance is not based on a conventional grading policy.

Performance in this class is based upon skill set mastery, outlined in the GRADING RUBRIC, which will be provided at the beginning of the course & is available on Bb. As you are **graded on skill set mastery**, you are **strongly** encouraged to work together and support each other in excelling in the class; which will simplify, speed up and promote your enjoyment in learning.

Rough letter grades will be provided on quiz and exam distributions during the class. However, this grade should be used only as a **rough** guide of progress. Lab reports and quiz grades are very strong indicators of performance. The overall course grade, derived from the lab report grade, quizzes, exam grades and the technique grade will be analyzed at the end of the course for assigning a letter grade. Ongoing course grades will not be curved, as there are designed to allow students a true perspective on their absolute subject mastery.

Questions about grading or errors with grading should be **discussed in person** with the instructor **at the time** that grades are distributed.

Overall Course Grade BREAKDOWN:

The contribution of course work to the final grade is as follows:

Quizzes	15%
Lab Reports (10 total)	35%
Exam I (Midterm)	10%
Exam II (Final)	30%
Technique &/OR Extra Credit*	10%

* Technique &/OR Extra credit will be calculated from the aggregated course grade, after letter grade boundaries have been assigned.

Final Course Grade Assignment:

Final course grades may be assigned using the plus/minus letter grade system.

The course grading policy is designed to emphasize subject mastery and to allow students a true perspective of their performance on an absolute scale of achievement. Students will be provided with grade distributions for course work and the rough A/B/C letter grade boundaries will be highlighted for quizzes and exams.

Final course grade awards are final, *unless* there has been a documented grading error. Negotiation of letter grades will **not** be entered into. However, students are encouraged to direct any questions about the grading policy or errors in grading individual work, to their instructor **immediately**. Questions regarding grading should be **discussed in person** with your instructor, **at the time** that grades are distributed.

The overall course letter grade is derived from the proportional contributions of; quiz grades, lab reports, techniques grade and exam grades. The final course letter grade will be assessed at the end of the course and the numerical letter boundaries will be determined each semester based upon skill acquisition highlighted in the grading rubric. On-going course grades are **not curved** and the rough A/B/C letter grade boundary will be highlighted – to allow students to determine their own performance within the course. If you have any questions about your course performance or grades – please schedule an appointment with your instructor immediately.

The approximate **mean percentage performance** of students who have previously taken this course and been awarded a final letter grade of A, B or C is shown:

	A	B	C
Quizzes	77%	71%	68%
Lab reports	89%	81%	76%
Exam 1	81%	75%	72%
Exam 2 (FINAL EXAM)	87%	81%	75%
Technique	100%	98%	97%

NOTE:

- These figures are only **rough** indicators of course work grades that contribute to the appropriate final letter grade.

- The instructor reserves the right to curve the course work score cut off boundaries, **up or down**, for letter grade determination; depending upon the specific rigor of exercises, **according** to the grading rubric.

Quizzes:

The quizzes are designed to ensure that students have thoroughly **reviewed the appropriate course material prior to each lab session**, that students fully understand the **objectives of the lab session** and also to reinforce critical thinking & numeracy skills.

There is a high correlation (0.9) between student's quiz performance and performance on the exams and overall course performance. Students are strongly advised to use the feedback from quizzes as a positive tool to promote their understanding of the material.

Quizzes will be given at the **beginning** of each lab and will always include questions designed to enforce students systematic problem solving and numeracy skills; i.e. such as dilution problems.

Although students have previously learned how to carry out dilution problems prior to taking this course, students typically have problems with dilution problems and numeracy skills. The quizzes have been very helpful for students to quickly and simply become proficient with the dilutions and numeracy skills ***used routinely*** within the laboratory setting.

Lab Reports:

Lab reports account for 35% of your course grade and **late reports will not be graded for credit.**

Lab reports will be due at the beginning of the class period of the week following a lab, **unless** instructed otherwise. Reports will be graded and returned to the students during the following lab period.

Reports must be **hand written**. Reports should be **concise, legible, and written in a clear and logical fashion**. Data should be presented in graphs or tables, in the appropriate section and order. Analysis of data can be prepared on a computer for lab reports, but students must know how to graph and present information manually for exams. Note; the **interpretation of data is just as important as the data itself.**

Each report should include the following sections:

I. Title of exercise (2 pts)

Describe in a single sentence the experiment that you carried out; making sure that the title is fully descriptive of the exercise you carried out.

II. Aim/Objectives (4 pts)

Describe in a couple of sentences the aim(s) of the experiment. Please don't restate what you did; however, mention ***WHY*** you did it. For example, "This lab was performed to demonstrate the blastogenic effect of mitogens on normal mouse spleen cells, as visualized by fluorescent microscopy."

III. Methods (2 pts)

Describe how you conducted your experiment. If you followed the methods described in the lab manual, please just refer the reader to the lab manual, including the relevant page numbers. However, if you modified the protocol in any way be sure to mention all of the specific modifications to the protocol which you made.

IV. Results (6 pts)

The narrative part of this section should be brief. Concisely state what you did, how you did it, and the experimental results you obtained. Do not write out the methods used, unless changes were made. **Present data in tabular and/or graphical form. Full calculations MUST be shown in this section.**

V. Discussion (6 pts)

Critically evaluate the results & discuss their significance. Present a rational analysis of your results. The idea is not to summarize your results (you should have already done that in the previous results section), but instead consider reasons underlying your results. What do your results tell you? Did the experiment work as planned? If not, explain why not? ***Pay particular attention to any positive or negative controls that were used!*** Were the values observed higher or lower than expected? Did any errors occur, or were there inherent problems in the experimental procedure? Discuss the significance of the experiment.

VI. Questions (20 pts)

Answer any questions **concisely** & **completely**. If the questions refer directly to comments in the discussion or results sections – you may refer to these sections. However, if you refer to the results or discussion sections, you must provide page and sentence numbers to the sections which you reference. Failure to completely reference sections within the results or discussion sections will result in the loss of points within the questions section.

Exams:

There will be **two** exams during the course, including the final. The first exam accounts for 10% of the final course grade. The final exam accounts for 30% of the final course grade.

The exams will **not** be returned, although all other material will be returned to students to provide feedback for improvement.

*Both exams are **cumulative***, the subject has a high degree of integration and redundancy, therefore, understanding of the previous material is necessary for mastery of ongoing material.

The exams are written to have an average of 60%. Exams are written to challenge and test **critical thinking skills, numeracy** and **subject mastery**. The rigor and average score of the exams have been chosen to allow students the opportunity to determine areas where they have weaknesses in understanding. Students who treat the feedback from the quizzes and first exam positively typically show great improvement in performance and do exceptionally well within in the course.

In order to excel on the exams, students should be willing to extensively review the course material and to pay particular attention to how the material **integrates** both with biological principles and the material they have learnt from their prior immunology and biology courses. **To excel in the course, it is vital for students to question why they are carrying out specific experiments or protocols, why they are using specific reagents and what specific experimental results are expected.**

Techniques and/or extra credit grade:

Students will be assessed on their proficiency within the lab. Students should expect to pay attention to their technique to ensure that they do not waste reagents or endanger themselves or their colleagues. Students will be awarded points for following lab rules and for being concise and meticulous within the lab.

Techniques and/or extra credit opportunities will be awarded at the end of the semester once the final letter grade boundaries have been determined, in order to assure that extra credit opportunities only promote student grades.

Advice for being a successful & productive student:

- Your initial grade in any course is 0%. YOU earn your own grade from that point.
- You can ONLY succeed through putting in the work to the material. “Only in the dictionary does SUCCESS come before WORK”
- Your instructor and TAs are there to help you
- Ensure you follow all instructions carefully. Instructions are there to simplify everyone’s lives. Not following instructions is one of the biggest reasons that students do not perform to their full potential in most classes
- Have a positive attitude. The more positive you can remain the quicker you will rebound from the knocks that life comes up with. Unfortunately success only comes after failure. Successful people are those who have kept trying.
- Always ask questions and address complaints immediately and directly following the policies. Mistakes happen and things break. Although no one likes to be the one to have to sort out problems it is always better to resolve problems early on, when they are relatively small, easy to remedy and people’s emotions have not been engaged.
- Read the syllabus (thoroughly) at the beginning of the semester and refer to the syllabus all the way through the semester. Syllabi are written to help you succeed and to know the expectations upon you in the course.
- Never leave things to the last minute. No one produces their best work when they leave things to the last minute. You will also deprive yourself of the opportunity of receiving assistance from your colleagues and instructor.
- Enjoy what you study. You cannot excel in a course or subject that you don’t like. If you don’t like the course or teaching style, select another offering of the course or choose another course to fulfill your degree plan requirements.
- Don’t WHINE – negative comments are very destructive and never help anyone; including yourself. It is hard for colleagues, instructors and advisors to help students who are rude, mean spirited, or offensive.
- Make sure you only sign up for classes or a work load that you can complete. If you take too many or too demanding classes you will burn yourself out and will adversely affect your performance and GPA.
- Non-majors courses are no less demanding or time consuming than majors courses

Dropping The Class:

Students are advised to Q drop the course if they:

- 1) are unable to devote the necessary time to the course
- 2) are unable to dedicate the necessary effort to the course
- 3) are unwilling seek help from their instructor as they require it.
- 4) decide they don’t like the material or style of instruction.

It is much better for students to Q drop courses they do not have the resources to excel in, than to earn a failing grade at the end of the semester.

Students may drop the course prior to the 4th class day without penalty. Students may self-elect to drop the course as indicated by University policy. The instructor adheres to university policy on awarding Q/F drops!

Auditing The Class:

Students may not audit this course.

Classroom Distractions:

- Cell phones should be turned off prior to class
- *Laptop computers are NOT permitted in class.*
- *Bags should not be left underfoot within the lab*

Accommodation For Students With Disabilities:

Any student with a disability who requires academic accommodations should contact the Services for Students with Disabilities area of the Office of the Dean of Students at 471-6259 or 471-4641 (TTY) as soon as possible, so that the appropriate accommodations can be made.

Students with accommodations from the Services for Students with Disabilities Office must provide **written documentation** of the required accommodations within the first week of the course.

Students who require additional time on exams, which has been authorized in writing by the SSD, are responsible for coordinating the exam schedule with both the SSD & their instructor. Arrangements for exam schedules, for students requiring extra time, must be made by the student at least **7 days in advance** of the regularly scheduled exam & the **arrangements must be emailed to the instructor ahead of each & every exam**. Students who fail to successfully co-ordinate or arrange their exams through the SSD appropriately may be unable to sit the exam.

Non-Academic Issues:

Any students with personal non-academic issues which may affect your performance in the class are requested to speak to the Office of the Dean of Students for Natural Sciences at 471-4536 as soon as possible, so that the appropriate accommodations can be made.

Academic Honesty:

- Students are expected to behave with integrity.
- Students are advised to completely understand and respect the definitions of cheating, plagiarism and collusion. If you have any questions regarding these practices please contact your instructor; as it is better to be safe than sorry.
 - Cheating involves the distribution of keys or copying other students works, for example within an exam.
 - Plagiarism involves the use and reporting of other individuals ideas and not accrediting those individuals accordingly.
 - Collusion involves the working together of students on projects, which are designed to be attempted by individual students.
- UT policy requires that all students who are identified as committing any of these acts should be reported to Student Judicial Services. Please ensure that you fully understand and respect the definitions of these unacceptable behaviors.
- Any student found distributing keys to exams or distributing past exam papers/questions will be referred to Judicial Services; with a recommendation of receiving an F in the course.
- Any student found distributing keys to current or past assignments or distributing past assignments/questions will be referred to Judicial Services; with a recommendation of receiving an F in the course.
- Any student found distributing keys to current or past extra credit exercises or distributing past extra credit questions will be referred to Judicial Services; with a recommendation of receiving an F in the course.
- Any student found to have copied from an exam (previous or current) will be referred to Judicial Services; with a recommendation of receiving a zero for their exam grade and a final course grade reduction.
- Any student found to have copied another student's assignment (previous or current) will be referred to Judicial Services; with a recommendation of receiving a zero for their assignment grade and a final course grade reduction.
- Any student found to have copied another student's extra-credit assignment (previous or current) will be referred to Judicial Services; with a recommendation of receiving a zero for their extra credit grade and a final course grade reduction.
- For information on the University of Texas Scholastic dishonesty policy, see the 2003-2004 General Information Catalog, Appendix C.

References For Students:

I am happy to write references. However, I write letters of recommendation as a courtesy and I can only write letters as my work schedule permits (typically in batches every 3 – 6 months)! Make sure you follow **ALL** of the instructions & submit the **COMPLETED** package early. I will not write recommendation letters for anyone who doesn't follow **ALL** of the instructions!

It is important that you realize that you earned your course grade & create your own reference; through your performance while within the course. To write a strong reference, your engagement, performance and critical thinking ability **must stand out**. The more I am able to mention tangibles such as attendance, participation, course work grades, exam results, critical thinking and problem solving ability; the stronger the reference. Employers, graduate school entrance committees and medical schools; are only concerned if you have the dedication, team aptitude & capability to carry out the work.

If you would like a reference (**5 total per student absolute limit**) contact me as early as possible & provide either **SINGLE completed** hand delivered (drop under my door PAI 1.48C) or mailed package - containing ALL of the following:

- Your full name (as shown on the formal UT roster)
- Your email address
- The course/s you took
- The semester you took the course
- The title of the position you are applying for!
- A contact name for the position (if available)!
- The address of the establishment
- The deadline date for the reference
- All necessary forms or waivers
- Supporting information, which accounts for any weak academic performance within the course you took!
- Short group project summary (if you completed one in the course)
- **TYPED/STAMPED** addressed envelope
 - (4 1/8" x 9 1/2" **ONLY**, NO FedEx or other envelopes!)
- **DO NOT** provide unrequested materials – these only distract me from completing the reference/recommendation letters.

NOTE:

- 1) I will need **ALL** of the above information for **EACH & EVERY** reference request!
- 2) Provide me with the information with at least 1 – 3 month's notice.
- 3) I only type references, as the online systems are problematic & complicated to work with.

Schedule of Exercises, SPRING 2013

<u>Date</u>	<u>Laboratory</u>		<u>Reference</u>
Jan 16 & 17	Check-in	Introduction to the facilities & course Syllabus & safety rules quiz!	Syllabus
Jan 23 & 24	Techniques & Dilutions Lab	Introduction to immunology tissue culture, pipetting, dilutions, & microscopy	Pg 17-29 App. 1,4
Jan 30 & 31	Lab 1	Blood cell morphology DILUTION PROBLEMS ARE DUE	Pg 30-40 App. 2
Feb 6 & 7	Lab 2	T cell rosettes	Pg 41-47 App. 3
Feb 13 & 14	Lab 3***	Mouse work & <i>In vitro</i> phagocytosis (demo)	Pg 48-56 App. 4
Feb 15 & 16		Harvest ConA culture (FRI & SAT)	-
Feb 18 & 19		Feed LPs blasts (MON & TUE)	-
Feb 20 & 21	Lab 4	Fluorescent staining of B-cell culture	Pg 57-63 App. 3
Feb 27 & 28	Lab 5*	ELISA	Pg 64-71 App. 5
March 6 & 7	EXAM 1		-
March 11 to 16		SPRING BREAK	-
March 20 & 21	Lab 6 - Part I*	IgG purification: Sodium sulfate precipitation & dialysis	Pg 72-77
March 27 & 28	Lab 6 - Part II	Ion -exchange chromatography & colorimetric protein quantitation	Pg 78-84
April 3 & 4	Lab 7***	Immunoelectrophoresis	Pg 73-89
April 10 & 11	Lab 8***	Immunodiffusion	Pg 90-96
April 17 & 18	Lab 9 - Part I*	Immunoblot analysis of HIV proteins (SDS-PAGE, transfer)	Pg 97-105
April 24 & 25	Lab 9 - Part II	Immunoblot analysis of HIV proteins Develop HIV Western blot	Pg 105-106
May 1 & 2	REVIEW	Review Session For Final Exam	-
5/3/13		LAST CLASS DAY	-
5/8/13	FINAL	Section 50185 (7.00 – 10.00 pm)	-
5/9/13	FINAL	Section 50180 (9.00 – 12.00 noon)	-
5/9/13	FINAL	Section 50190 (7.00 – 10.00 pm)	-
5/11/13	FINAL	Section 50175 (2.00 – 5.00 pm)	-

Immunology Lab Rules

Whether working with infectious agents or not, students (and instructors) must **ALWAYS practice safe laboratory technique**. This laboratory facility **IS** used for the study of **pathogenic organisms**. Even the “non-pathogenic” agents used in this class can cause infection within humans or domesticated/laboratory animals. Also, **the human blood used in our exercises is considered a Class II biohazard and must be handled with appropriate safety precautions**. Keep in mind that cell cultures also represent potential hazards since all harbor endogenous viruses. Anyone who has tested positive for HIV (or is otherwise immunocompromised) must discuss the matter with the instructor. The following general safety practices must be observed:

1. No eating, drinking, smoking, gum chewing, or applying of cosmetics is permitted in the laboratory. Also, avoid touching eyes, nose, mouth, or face when working in the lab.
2. Unauthorized persons, especially children and infants, are **NOT** permitted in the laboratory.
3. Do not enter the lab when another class is meeting. The schedule is posted on the door.
4. Keep your workspace clear and uncluttered. Store coats, backpacks, and unneeded items in the hall lockers or at the front of the room.
5. **ABSOLUTELY NO MOUTH PIPETTING**. Use automatic pipettor pumps or bulbs only.
6. Hands should be washed before and after working in the laboratory.
7. When used, gloves should be worn only for specific tasks. Do not touch doorknobs or other common surfaces with gloves that may be contaminated. Contaminated gloves should be disposed in the appropriate waste bin.
8. Laboratory coats or smocks should be worn inside the lab and should be left in the hall lockers. Do not wear lab coats outside the lab, especially when eating or smoking. Also, avoid wearing of open shoes or sandals in the laboratory. **ANYONE WEARING SANDALS OR OPEN SHOES WILL BE ASKED TO LEAVE THE LAB.**
9. Clearly identify materials by labeling with the user's name and contents, but please don't write on glassware with permanent marking pens.
10. Always dispose of contaminated items in the appropriate bins. All materials contaminated with infectious materials must be discarded in the autoclave containers, so they can be sterilized prior to disposal. **DO NOT** discard these materials in the sink or trash cans! Special waste containers must also be used for disposal of needles and syringes (“sharps”), broken glassware, radioactive compounds, and organic solvents.
11. Keep your workstation clean. Always wipe your work surface with disinfectant **before and after use**. **Discard your waste before leaving the laboratory**.
12. Never take biological samples out of the laboratory.

Note: technique accounts for 10% of your course grade!
Willfully disregarding rules which maintain the safety of yourself and others will IMMEDIATELY result in the loss of your techniques points & may result in you being asked to leave the course!

BIO160L Grading Rubric

- Grades are assigned based up on **SUBJECT MASTERY** and **SKILL SET** achievement.
- To help you understand the grading structure I have put together the following grading rubric.
- The quizzes, lab reports & midterm exam are designed to help you to put the material together
- The grading emphasis for the midterm exam is 10% (of your final course grade), allows this exam to be formative.
- The quizzes, lab reports & exams are designed to challenge you with some **MATERIAL YOU HAVEN'T SEEN BEFORE.**
- **Exams are written to have a MEAN score of approximately 60%**
- **The Quizzes & EXAMS are YOUR most important tools to assist YOU master the material & identify areas needing YOUR attention.**

Letter Grade	Mastery Level	Subject Mastery	Predicted Effort
A	Outstanding	<ul style="list-style-type: none"> • Fully able to formulate & solve open ended research problems • Fully conversant with controls & experimental design • Fully able to critically critique & analyzes research data • Fully numerate, able to solve all quantitative problems • Fully comprehends the limits & requirements of each protocol reviewed • Has a complete grasp of the skills from levels B & C 	<ul style="list-style-type: none"> • Student always seeks assistance as needed • Quizzes completed to an exceptional standard • Lab reports completed to very high standard • All course work completed & handed in • All course materials read & extra literature reviewed as necessary
B	Good	<ul style="list-style-type: none"> • Able to formulate & solve open ended research problems • Conversant with controls & experimental design • Able to critically critique & analyzes research data • Numerate, able to solve quantitative problems • Comprehends the limits & requirements of each protocol reviewed • Has a strong grasp of the skills from level C. 	<ul style="list-style-type: none"> • Student seeks assistance as needed • Quizzes completed to an high standard • Lab reports completed to high standard • All course work completed & handed in • All course materials read & extra literature reviewed as necessary
C	Competent	<ul style="list-style-type: none"> • Mostly able to formulate & solve open ended research problems • Mostly conversant with controls & experimental design • Mostly able to critically critique & analyzes research data • Numerate, able to solve most quantitative problems • Mostly comprehends the limits & requirements of most protocols reviewed 	<ul style="list-style-type: none"> • Student seeks assistance as needed • All assignments completed & handed in. • Course materials are read • Extra literature mostly reviewed as required
D or less	Incomplete	<ul style="list-style-type: none"> • Unable to formulate & solve open ended problems • Doesn't understand controls & experimental design • Unable to critically critique & analyzes research data • Unable to solve quantitative problems • Doesn't comprehend the limits & requirements of most protocol reviewed 	<ul style="list-style-type: none"> • Failure to seek assistance with problems • Lab reports incomplete or not turned in. • Subject material not reviewed • Extra literature not reviewed as required • Excessive absences