

BIO206L

INTRODUCTORY LABORATORY EXPERIMENTS IN BIOLOGY

Spring 2014

Course Description

This course has been designed to engage you, to excite you, and to get you thinking like a scientist! Each topic will be covered in a collaborative, 'hands-on' manner. You will work with your fellow students to generate hypotheses, design experiments and collect data. The semester begins with an introduction to cell and molecular biology techniques used in a broad range of laboratory work. You will master the use of optical microscopes and study the structure of protists as well as plant and animal cells. Molecular techniques such as gel electrophoresis and the amplification of segments of DNA using PCR (polymerase chain reaction) will be introduced as well. You will then spend the next portion of the course examining animals and plants and how their structure and physiology are a reflection of millions of years of evolution. We'll focus on two plant processes (photosynthesis and transpiration) and three key animal systems (respiratory, cardiovascular, and nervous) to gain an understanding of how plants and animals maintain their internal environment. You will also study animal behavior by using crickets as a model system. At the end of the semester, we hope you are as amazed as we are by the great diversity of life and have a deeper appreciation for the role of evolution in shaping its form and function.

BIO206L consists of the range of unique numbers 49110-49250. Each unique number corresponds to a Monday lecture time and a corresponding specific laboratory time & location. Scheduled locations and times of all BIO206L sections are listed in the Spring 2014 Course Schedule online: <http://registrar.utexas.edu/schedules/>

You must attend the BIO206L lecture and laboratory section for which you are officially enrolled (for authorized exceptions, see below). Attending the lecture will help you to prepare for lab that week. You should have either registered for or have credit for BIO311C in order to take BIO206L. If this is not the case, you should consult Dr. Allen immediately.

Required materials

Textbook

The required text for BIO206L is the lab manual "**Introductory Laboratory Experiments in Biology**," sold exclusively at the University Co-Op bookstore on Guadalupe Street. The introduction and procedures for exercises 1-12 are found in the lab manual. The material for exercises 13 and 14 will be posted on the course website. An introductory biology text of your choice such as that used in BIO311C and BIO311D is also recommended as a background reference.

Lab Notebook

Researchers use laboratory notebooks to document their hypotheses, experiments, observations, illustrations and their interpretations of these experiments. You are required to purchase a standard lab notebook. **Do not** spend extra money to purchase a notebook that creates duplicate pages! You can purchase a standard lab notebook at the University Co-Op or at any store that sells office supplies.

Course Website

The course **website** can be found at <http://w3.biosci.utexas.edu/bio206L/>. The course website is password protected. As a registered student, you may access the course website. You will be given the username and password via a “welcome” email. It contains general course and instructor information as well as a source of online resources that are **integral to success in the course**. All announcements and required course information is accessible from our URL listed above.

LabClicker System

We will use LabClicker, a web/cloud-based classroom response system during Monday lectures. Any wireless device that can access the web (smartphone, iPod touch, iPad, laptop computer, etc.) will be acceptable. See the “Lecture Periods” section below for login, cost, and additional information.

Quest Learning and Assessment

You will use the **Quest Learning and Assessment** system to complete your homework assignments. Quest is accessible at: <http://quest.cns.utexas.edu>. Quest requires a course materials charge per student for its use and you will be asked to pay via credit card after the 4th class day. For payment questions, email quest.fees@cns.utexas.edu.

Canvas

Canvas will serve as the repository of ALL BIO 206L scores that will comprise your total BIO206L final grade. It is your responsibility to ensure that your scores for all of the various BIO 206L assignments are correctly displayed in Canvas. Canvas is accessible at: <http://canvas.utexas.edu/>

Course Personnel

Dr. Allen typically assists with special situations such as special accommodation for students with disabilities, exam conflicts, etc.

Lecturer: Dr. Bill Allen

Office hours: Mondays from 10 – 1 p.m. in PAI 1.22G (or by appointment)

Email: billallen@austin.utexas.edu

Phone: 512.471.2691

Instructor: Dr. Hans Hofmann

Office hours: Mondays from 10 -11 a.m. in PAT 319 (or by appointment)

Email: hans@utexas.edu

Phone: 512.475.6754

Lecturer: Dr. Martha Maas

Office hours: Mondays from 10 – noon in PAI 1.13B (or by appointment)

Email: m.maas@austin.utexas.edu

Phone: 512.471.3962

Laboratory Coordinator: Dr. Delia Brownson

Office hours: Available by appointment in PAI 1.22A

Email: delia@austin.utexas.edu

Phone: 512.232.9281

Laboratory Instructors (Teaching Assistants)

A Laboratory Instructor (LI) will supervise your work during each laboratory period for the duration of the semester. Your Laboratory Instructor should be your first point of contact for individual assistance during the course. He/she will be available to assist you during regularly scheduled office hours or by appointment. Each Laboratory Instructor will provide a handout with additional details including his/her office hours.

Course Structure**1. Lecture Periods**

These are held every Monday and consist of a semi-formal presentation to provide background information on the topics covered in lab. In lecture, we will usually pose anywhere from 3 to 5 questions to help you assess your own understanding of the material. Starting Monday, January 27th, we will begin to record your responses using the web-enabled LabClicker system in lecture.

You can earn up to 100 points using the LabClicker system. The total LabClicker points you earn will be determined by the percentage of questions you answer **correctly** over the course of the semester. However, we will drop your five lowest questions when determining your score. You cannot earn more than 100 LabClicker points. You cannot make up a LabClicker question for ANY reason!

To use the LabClicker system, you must register using your UTEID online at <http://labclicker.com/>. The use of the LabClicker system requires a \$14 plus tax registration fee and a personal web-enabled device such as a smart phone, tablet, computer laptop, etc. If you do not own a personal web-enabled device, laptops may be checked out from the Service Desk of Information Technology Services (ITS) in the Flawn Academic Center.

If you require additional assistance regarding the proper online registration of LabClicker and its usage, please visit the course website at <http://w3.biosci.utexas.edu/bio206l/LabClicker.php>.

2. Lab Prep Homework

The lab prep assignments will be administered through Quest and will contain questions that are designed to help you prepare for each upcoming lab in an interactive manner. We therefore recommend that you carefully read the appropriate section in the manual before you attempt the lab prep assignment.

There will be 15 graded lab prep assignments over the course of the semester. Each assignment will be worth 6 points, and we will take the top 14 grades (for a total of 84 points possible). However, if you fail to complete 2 or more lab prep assignments before labs, we will reduce your overall final grade by **a full 1%** of the total course grade. You will not be able to make up a lab prep assignment, and the Quest system can run slow, so be sure to complete your lab prep assignment well in advance of the due date and time.

The precise due date and time are indicated in Quest on the Quest assignment summary page for the course and as part of the assignment itself. Your successful use of this interactive system will depend on your internet service, browser type, and computer. So examine Quest Help files regarding the latest browser versions supported and be sure that you have a reliable computer and internet connection (wireless is NOT recommended) when completing these lab prep assignments.

Please contact Dr. Maas by email if you experience any problems with lab prep homework assignments.

NOTE: You cannot make up a lab prep homework assignment for ANY reason!

3. Laboratory Performance

The Course Schedule lists the lecture topics and fourteen laboratory exercises that will be covered this semester. For each laboratory exercise, you will receive a 'Lab Performance' grade. You can earn a total of 12 performance points during each lab. We will take the top 13 of the 14 performance grades (for a total of 156 points possible).

To earn all 12 performance points you must:

- 1) Thoroughly prepare for lab (read manual, understand concepts, watched relevant videos, and reviewed methods).
- 2) Arrive on-time and in proper attire (closed-toed shoes, long pants, etc.) to lab.
- 3) Demonstrate good laboratory skills.
- 4) Thoroughly record your hypotheses, observations, results, etc. in your lab notebook.
- 5) Stay focused on the exercise.
- 6) Perform clean-up duties.

When you arrive to lab, the Laboratory Instructor (LI) will record whether you have **arrived on-time and the appropriateness of your attire**. Your LI may then provide additional instructions, altered procedures, or special precautions. Do not begin any lab work until instructed to do so by your Laboratory Instructor.

During lab, your LI will carefully observe you as you perform the activities of each laboratory exercise. Your LI will record whether you are **prepared for lab** and able to **demonstrate good laboratory skills**. Your adherence to instructions and safety rules will be evaluated also.

During lab, you need **to take notes and record your data and results in your lab notebook** as appropriate for each exercise. Each individual at your lab table should record the information separately in their lab notebook, even though for some of the exercises all individuals at a table will have obtained the same information. The observations of living or preserved specimens should be in the form of notes, drawings, and/or diagrams, which must include complete identification of the organism, body part(s) or structure(s), and any other pertinent information (e.g., age or state of maturity, sex, specific strain or preparation, etc.). Any illustration made with a microscope should have a note next to it indicating the type of microscopy used (e.g., bright-field) and the total magnification at which the specimen was observed. Artwork will not be graded on the artistic quality; it is more important that the organisms and/or structures are recognizable and properly labeled. If the exercise involves making a series of observations to note changes over time, the report should also include a brief summary. Throughout the semester, your LI will evaluate your notes, observations, illustrations, and summaries during lab. A guideline for using your lab notebook is posted on the course website.

During lab, your LI will regularly observe the class to determine if all students are **focused on the exercise**. If you are engaged in activities unrelated to the lab (texting, etc.), your LI will ask you to return to work.

The LI will explain required **clean-up activities** and clarify other course obligations as necessary for a given laboratory period. Perform these clean-up duties as required. The BIO 206L prep staff will evaluate your clean-up activities. You may ask for permission to be dismissed after you have completed all of the procedures, demonstrated your laboratory skills to your LI, submitted your notes and data to your LI for evaluation, and completed your clean-up responsibilities.

4. Laboratory Reports

You will complete a laboratory report for 13 of the exercises (you will complete a Formal Lab Write-up for Exercise 12). You can earn a total of 20 points for each laboratory report and must complete all of 13 laboratory reports for a total of 260 points possible. We do not drop your lowest laboratory report score when determining your grade.

Each report will include questions that you will answer as a group and questions that you will answer individually. These questions will require you to explain your observations/data as well as their significance with conceptual synthesis and application to evaluate your understanding of the experiments conducted. You must have participated in the lab in order to submit a lab report (although valid emergency exceptions may apply –see “Policy with Respect to Absences” below). You are expected to maintain the University's Honor code (see the “Policy on academic integrity” below). Dividing up the lab report questions among fellow students is **NOT ALLOWED** because it violates UT's Honor Code nor is not an effective strategy for preparing for exams, or doing well in the course overall.

Be sure to access the lab report assignment from the course website prior to each laboratory period. Please examine the questions prior to lab to ensure you acquire the proper data and you fully understand the questions. You should complete as much as possible of the lab report during the actual lab. Working on the lab report during the actual lab will improve your report because the material is still fresh and you can also ask your LI or UGLA for help at that time.

Write in complete sentences, using proper grammar and spelling. Be complete yet concise in your answers. Grading of the work will be based on completeness, evidence that experiments have been conducted correctly and carefully, accuracy of illustrations and identifications/labels, interpretation of results, and clarity. Neatness and brevity will also be taken into consideration. Incorporate data into appropriate graphs, tables, labeled figures, etc. whenever possible and as instructed. **Also, be sure to appropriately cite your sources.** Guidelines for citing references are available on the course website.

You must submit your report before the beginning of the next lab exercise (unless stated otherwise). Note: you may not use the printers in the lab. Any reports submitted **later than 15 minutes** after the start of the laboratory period on the due date will be **considered late and penalized 10% each day**. Any report turned in more than 48 hours late will not be accepted for grading, and a "0%" grade will be recorded for that report.

5. Formal Lab Write-up

Exercise 12 will be written up as a formal lab write-up worth a total of 100 points. This write-up is to be submitted in the format of an article as it would appear in a professional scientific journal. Successful completion of Exercise 12 and the formal write-up will also involve an introduction to library resources with interactive online library tutorials and a peer-review of your formal write-up prior to submission. A written summary of the guidelines for the formal write-up can be found on page vii of your lab manual. Additional details and guidelines will be given later in the semester and will be available on the course website.

6. Examinations

Midterm Exam: There will be a midterm exam worth 150 points on **Monday, March 3rd** from 7:30 to 9:00 PM.

This exam will cover both lecture and laboratory material relating to Exercises #1 – #7. It will have a written as well as a practical portion consisting of slide projections requesting identification of the structure and/or function of organisms viewed in the laboratory exercises. The details of this exam will be discussed at a later date. If you have a legitimate academic conflict with the scheduled evening exam, contact Dr. Allen **BEFORE** the 4th class day to schedule your midterm at an alternate time.

Laboratory Practical Examination: No laboratory exercise is assigned during the last week of the course. Instead, you will take a one-hour "Laboratory Practical Examination" scheduled during your regular laboratory period that week (April 29th to May 2 2014) worth 150 points. The format and the method of administering the practical exam will be explained later in the semester. Each Laboratory Instructor will administer the Laboratory Practical Examinations for his/her sections. There will **not** be a Bio206L final examination during the final exam week at the end of the semester.

Typical student obligations in BIO206L to prepare for each laboratory exercise	
Prior to lecture:	Read through the entire exercise in the manual.
During lecture:	Take notes to record information relevant to the exercises. Note any special announcements pertaining to the course, the current lab exercise, changes in lab procedures, etc. See the link/QR code of updates. Answer questions based on material for the current lab exercise as given during the lecture using the LabClicker system.
Prior to the lab exercise:	Complete the lab prep assignment in Quest before the specified deadline.
At the beginning of lab:	Submit your lab report.
During the lab exercise:	Demonstrate good laboratory skills and adhere to safety guidelines. Acquire data, taking good notes and making good observations. Perform the exercise in cooperation with other individuals at your table. Perform proper disposal and clean up requirements and any other specifications as given by your LI.
After/between labs:	Complete the lab report.
Throughout the semester:	Diligently prepare for the midterm and final examinations.

Grading

Your grade in BIO206L will be determined as follows:

Lecture Attendance (LabClicker)	% of questions answered correctly	100
Lab Prep Homework (6 points each)	best 14 of 15	84
Lab Performance (12 points each)	best 13 of 14	156
Lab Reports (20 points each)	all 13 required	260
Formal Lab Write-up		100
Midterm Exam		150
Laboratory Practical Exam		150
TOTAL POINTS POSSIBLE:		1000

This gives a total of 1000 possible points. The course grade will be computed by dividing the sum of all points earned by 10.0 to obtain a score based upon a 100 point scale. If your score falls within one of the categories listed below, you are guaranteed the letter grade indicated. In this course your final course grade will be one of the following: 93-100 points = A, 90-92.99 points = A-, 87-89.99 points = B+, 83-86.99 points = B, 80-82.99 points = B-, 77-79.99 points = C+, 73-76.99 points = C, 70-72.99 points = C-, 67-69.99 points = D+, 63-66.99 = D, 60-62.99 = D-, below 60 points = F.

The grade you will receive at the end of the semester is the grade you earn. There is *NO* extra credit of any kind in this course.

All scores that will comprise the total final grade will be posted in **Canvas**. All student grades will be available for individual inspection on Canvas using your UT EID. This means YOU ARE RESPONSIBLE to review and confirm in timely manner each day that correct grades have been posted.

If you have an issue with your LabClicker score use the online form on the BIO 206L course website.

If you have an issue with a grade on your Lab Performance or Lab Report contact your LI.

If you have an issue with your Quest Assignment please contact Dr. Maas.

Due to Federal law, scores and evaluation of your performance may be discussed **ONLY** during office hours or by appointment.

IMPORTANT Policies

Policy on academic integrity (Honor Code):

You are expected to maintain academic integrity. ***The University of Texas at Austin Honor Code*** states: “*The core values of The University of Texas at Austin are learning, discovery, freedom, leadership, individual opportunity, and responsibility. Each member of the University is expected to uphold these values through integrity, honesty, trust, fairness, and respect toward peers and community.*”

All assignments must be your OWN work. All submitted assignments will be checked for evidence of cheating. When cheating is suspected, we will act in accordance with the University’s honor code policies. If you become aware of the scholastic dishonesty of a fellow student, you are obligated by the University Honor Code to report it. Students who violate the University’s policies on academic integrity are subject to disciplinary penalties, including the possibility of failure in the course and/or dismissal from the University. At minimum, the incident will be reported to the Dean’s office and SJS, where a permanent record of the violating incident will be placed in the student’s file, and a score of zero will be given for the assignment or exam in question. To see the UT academic dishonesty policy, please see:

http://deanofstudents.utexas.edu/sjs/acadint_conseq.php

Policy with Respect to Absences from Laboratory Exercises

If you know in advance that you must miss a regularly scheduled laboratory period during a particular week, then you should fill out the “Lab Switch Form” available on the BIO 206L website to request permission to attend a substitute laboratory section. Valid reasons for missing a lab include a graduate school interview, death in the family, religious observance, exams that are published in the course catalog, etc. Provided the absence is appropriately justified and if space is available, permission to attend an alternative section will be granted. You will receive an email notification as to the substitute laboratory time and room you may attend for that one lab. Submit your lab report from the previous week to your substitute LI. The substitute Laboratory Instructor will evaluate your laboratory performance and provide your performance score to your regular Laboratory Instructor along with your lab report. The following week, attend your regularly scheduled laboratory section.

In emergency situations, where you must miss an exercise without advanced warning, contact **Dr. Brownson** to obtain permission to attend a lab. Also fill out the online “Lab Switch Form” as soon as possible to document the situation. You will be required to provide evidence to confirm the reason of your absence and to determine the validity of your excuse. If you are unable to attend any labs that week, and your excuse is deemed valid, your LI will provide you with data, and you will be allowed to complete the lab report for the missed lab. You will not earn any points for Lab Performance for this missed lab.

If you miss a second laboratory exercise, immediately contact Dr. Allen. A student who must miss more than one exercise during a semester should strongly consider dropping the course.

Policy on Religious Observance

The University of Texas at Austin policy is that the student must notify each instructor at least fourteen days prior to the classes scheduled on dates he or she will be absent to observe a religious holy day. For religious holy days during the beginning of the semester, the notice should be given on the first day of the semester. Proper notice should be given by completion of the online “Lab Switch Form” to request permission to attend substitute laboratory section for that one lab only. See the above section regarding course policy with respect to absences. The student may not be penalized for these excused absences but the instructor may appropriately respond if the student fails to notify *PRIOR* to the observance or complete the missed assignment or examination within a reasonable time after the excused absence.

Students with Disabilities

Specialized services are available on campus through Services for Students with Disabilities (SSD). Typically you must provide documentation to the Dean of Students’ Office, such that appropriate accommodations can be determined. If deemed that special accommodations may be made, the SSD office should provide you with a letter which you should submit to one of the Instructors of Record as soon as possible (by the 12th class day or as soon as the official accommodation request letter is obtained).

Important Dates

Students are responsible for keeping track of the important dates listed in the University calendar that may affect their status. Please note the following information provided by the Registrar’s office: <http://www.utexas.edu/student/registrar/>

Monday, January 13th: Lectures begin

Tuesday, January 14th: **Labs begin for all lab sections.**

Thursday, January 16th: Last day of the official add/drop period.

Wednesday, January 29th: Last day to drop a course for a possible refund Last day an undergraduate student may, with the required approvals, add a course except for rare and extenuating circumstances.

Monday, March 31st: Last day an undergraduate student may, with the dean's approval, withdraw from the University or drop a course (with a Q) except for urgent and substantiated, nonacademic reasons. Last day a student may change registration in a course to or from the pass/fail or credit/no credit basis.

Apr 28 to May 2: One-hour Laboratory Practical Examination during your regular laboratory section.

Spring 2014 SUMMARY COURSE SCHEDULE

<u>Date</u>		<u>Lecture and Lab Exercise</u>
Jan 13 - Jan 17	Exercise 1	Laboratory Equipment and Procedures
No lecture on Monday, January 20th, but labs do meet this week.		
Jan 21 - Jan 24	Exercise 2	Basic Light Microscopy
Jan 27 – Jan 31	Exercise 3	Advanced Techniques of Light Microscopy
Feb 3 – Feb 7	Exercise 4	Plasmids, Restriction Enzymes, and Agarose Gel Electrophoresis
Feb 10 – Feb 14	Exercise 5	Biotechnology: PCR, Bacterial Transformations and Bioinformatics
Feb 17 – Feb 21	Exercise 6	Biotechnology: Gel Electrophoresis, DNA Fingerprinting and Bacterial Transformation Analysis
Feb 24 – Feb 28	Exercise 7	Plant Diversity and Anatomy
Mar 3 – Mar 7	Exercise 8	Plant Physiology: Photosynthesis and Transpiration
Monday March 3rd: Midterm Examination 7:30-9 pm (locations TBA)		
March 10 – 14: Spring Break (no lecture or labs this week)		
Mar 17 – Mar 21	Exercise 9	Animal Development
Mar 24 – Mar 28	Exercise 10	Animal Anatomy: Vertebrates and Invertebrates
May 31 – Apr 4	Exercise 11	Animal Physiology: Respiratory and Cardiovascular Systems
Apr 7 – Apr 11	Exercise 12	Animal Behavior: Cricket Aggression
Apr 14 – Apr 18	Exercise 13	Neurophysiology
Apr 21 – Apr 25	Exercise 14	Psychophysics
Apr 28 – May 2	Laboratory Practical Examination (during your regular lab section)	