# SUMMARY COURSE SCHEDULE

<table>
<thead>
<tr>
<th>Date</th>
<th>Lecture</th>
<th>Lab Exercise</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aug 30-Sept 3</td>
<td>Course Introduction Laboratory Safety Preparing Aqueous Solutions Introduction to Optical Microscopy</td>
<td>Exercise 1 Basic Equipment and Supplies, Laboratory Safety, and Preparation of Aqueous Solutions</td>
</tr>
<tr>
<td>Sept 6-Sept 10</td>
<td><strong>Sept 6th NO Lecture</strong> <em>(Labor Day Holiday)</em></td>
<td>Exercise 2 Observing Cells by Light Microscopy</td>
</tr>
<tr>
<td>Sept 13-Sept 17</td>
<td>Contrast and Techniques of Optical Microscopy</td>
<td>Exercise 3 Techniques of Light Microscopy</td>
</tr>
<tr>
<td>Sept 20-Sept 24</td>
<td>Eukaryotic and Prokaryotic Cell Structure, Growth, and Division, Cell Reproduction</td>
<td>Exercise 4 Exponential Growth and Eukaryotic Cell Reproduction, Growth &amp; Differentiation</td>
</tr>
<tr>
<td>Sept 27-Oct 1</td>
<td>Isolation of Cellular Organelles Metabolic Reactions</td>
<td>Exercise 5 Isolation of Cellular Organelles and Cellular Respiration and Photosynthesis Reactions</td>
</tr>
<tr>
<td>Oct 4-Oct 8</td>
<td>Purification of Biological Molecules Principles of Chromatography</td>
<td>Exercise 6 Separation of Biological Molecules by Chromatography</td>
</tr>
<tr>
<td>Oct 11-Oct 15</td>
<td>Protein Purification</td>
<td>Exercise 7 Extraction and Measurement of Cellular Proteins</td>
</tr>
<tr>
<td>Oct 18-Oct 22</td>
<td>Principles of Electrophoresis Characterization of Proteins</td>
<td>Exercise 8 Protein Gel Electrophoresis and Electroblotting</td>
</tr>
<tr>
<td>Oct 25-Oct 29</td>
<td>Enzymes, DNA polymerases, PCR Bioinformatics and Protein Domains</td>
<td>Exercise 9 Protein Detection and Western Blot Analysis Bioinformatics –Protein Databases</td>
</tr>
<tr>
<td>Nov 1-Nov 5</td>
<td>Bioinformatics and Phylogenies and Isolation of DNA</td>
<td>Exercise 10 Bioinformatics -DNA Analysis Isolation of Plasmid DNA and Human Genomic DNA</td>
</tr>
<tr>
<td>Nov 8-Nov 12</td>
<td>Biotechnology and Bacterial Transformation</td>
<td>Exercise 11 PCR of Plasmid and Genomic DNA Restriction Digest of Plasmid DNA Bacterial Transformation</td>
</tr>
<tr>
<td>Nov 15-Nov 19</td>
<td>DNA Analysis</td>
<td>Exercise 12 DNA Gel Electrophoresis Analysis of Restriction Digest Analysis of Transformation</td>
</tr>
<tr>
<td>Nov 22-Nov 26</td>
<td><strong>None</strong> <em>(Happy Thanksgiving)</em></td>
<td><strong>THANKSGIVING BREAK</strong></td>
</tr>
<tr>
<td>Nov 29-Dec 3</td>
<td>Course and Lab Practical Exam Review</td>
<td><strong>Practical Examination</strong></td>
</tr>
</tbody>
</table>
BIOLOGY 205L
LABORATORY EXPERIMENTS
IN CELLULAR AND MOLECULAR BIOLOGY
Fall 2010

BIO 205L consists of the range of unique numbers 48130 – 48255. Each unique number corresponds to a specific lecture time & location on Mondays, and a specific laboratory time & location on T/W/Th. You must attend the BIO 205L section for which you are officially enrolled (for authorized exceptions, see below). Scheduled locations and times of all BIO 205L sections are listed in the Fall 2010 Course Schedule online: <http://utdirect.utexas.edu/registrar/>.

Course Instructors of Record:

Dr. Bill Allen
Office Location: PAI 1.22G
Office Hrs*: Mon. 10:00 a.m. - 1:00 p.m.
Telephone: 471-2691
e-mail address: billallen@mail.utexas.edu

Dr. Moon Draper
Office Location: NMS 4.306
Office Hrs*: Wed. 2-3:30 pm
Telephone: 471-3912
e-mail address: maturin@mail.utexas.edu

Dr. Enamul Huq
Office Location: BIO 21B
Office Hrs*: Tue. & Fri. 2-3:30 pm
Telephone: 471 9848
e-mail address: huq@mail.utexas.edu

The Course Instructors of Record are responsible for the overall administration of the course, and they provide the Monday lectures. Although they are all available throughout the semester for consultation, Dr. Draper will administer the first third of the course, Dr. Allen will administer the middle third, and Dr. Huq will administer the last third.

Dr. Delia Brownson
Laboratory Instruction Coordinator
Office Location: PAI 1.22A
Office Hrs*: Mon 10:00 a.m. - noon
Telephone: 232-9281
e-mail address: dmb@mail.utexas.edu

Dr. Brownson and the preparations staff set-up, maintain, and coordinate all Bio205L laboratory activities.

*The Instructors will be available at times other than regular office hours as requested. Please e-mail or call to make an appointment at times other than regularly scheduled office hours.

Laboratory Instructors (Teaching Assistants)
A Laboratory Instructor will supervise your work in the laboratory each week for the duration of the semester. Your Laboratory Instructor should be your first contact for individual assistance during the course. He/she will be available to assist you during regularly scheduled office hours or by appointment. Laboratory Instructor office hours and other specific information regarding your laboratory section will be provided early in the semester during your laboratory period.
Text and Manual:
“Laboratory Experiments in Cellular and Molecular Biology,” prepared by UT-Austin faculty and staff, is a combination textbook and laboratory manual designed for this course. It is sold at the University Co-op bookstore on Guadalupe Street.

BIO 205L Website:
http://w3.biosci.utexas.edu/bio205L/ This site has general course and instructor information as well as PDF versions of all handouts and exams from previous years. Some portions of this website are password protected. As an officially registered student, you may access this information using the login: username: bio205L password: 205L=cell

GENERAL COURSE INFORMATION

Introduction
Cell and molecular biology are large and diverse fields of active research, employing many more techniques and procedures than could be learned by one individual in a lifetime. However, certain basic techniques are used in a broad range of laboratory work. In this course you will become familiar with many of these techniques while at the same time developing laboratory skills and learning standard laboratory practice. The exercises presented early in the semester introduce procedures that should be mastered by practically all cell and molecular biologists. Later exercises employ rather sophisticated procedures and require a good understanding of techniques learned earlier. Thus, the course content builds in complexity, making it important to understand each exercise thoroughly before proceeding to the next.

Although the 4-hour laboratory period each week is the central focus of the course, the Monday lectures and laboratory manual reading assignments are also very important. They provide background information necessary for a comprehensive understanding of the laboratory exercises, they discuss safety considerations, and they facilitate the completion of formal course assignments. Many reference books in the Life Sciences Library (MAI 220) contain subject matter that is of direct relevance to these exercises, and numerous web sites contain relevant information. You are strongly encouraged to take advantage of these resources.

Course structure
The Summary Course Schedule lists the lecture topic and laboratory exercise to be covered each week during this semester. Assignments that are due nearly every week are described in more detail here.

1. Lecture Periods
On Mondays of each week a 50-min lecture will provide background information on the topic to be addressed in the laboratory exercise that week.

a. Lecture attendance is required (see below). Lectures will be presented semi-formally; you are encouraged to comment or ask questions as appropriate.

b. Lecture attendance and comprehension will be assessed using the Class Participation System (CPS). The evaluation by CPS will constitute 10% of your overall grade in the course. The use of CPS requires that you purchase a “remote” from the University-Coop and online CPS registration. You will be provided with an additional handout with detailed instructions regarding online CPS registration and usage. IMPORTANT: this handout will also indicate how to seek help should you have any technical difficulties with the CPS system. Please note, BIO 205L course instructors and individual laboratory instructors are NOT responsible for any technical difficulties you may experience with the CPS system. You may seek technical support ONLY from eInstruction, UT-ITS, and the Biology instructional support staff as described in the CPS handout.
2. Use of the textbook-laboratory manual

The textbook-laboratory manual is divided into two major components. Part 1 consists of 17 Chapters and Part 2 consists of 12 Exercises. There is also an Appendix with useful information. Exercises will be performed sequentially as listed in the manual according to the dates given in the Summary Course Schedule. Corresponding chapter reading assignments are given at the beginning of each exercise and additional readings may be assigned during some lecture periods. Use the chapter information to improve your understanding of the principles behind the procedures to be used in performing the exercises, and to help answer the questions at the end of the exercises. Bring your laboratory manual to the laboratory during each exercise so you can follow the “Procedures” accurately. “Clean-up” duties, “Data Entry and Results” sheets, and other laboratory responsibilities are evaluated as part of your “Laboratory Performance” grade. The “Analysis” section contains questions to be answered and submitted the following week at the beginning of the laboratory period. Some laboratory exercises conclude with a “Supplementary Problem Set” section that may help to reinforce your understanding of the material to be learned that week. You are encouraged to complete these. Sometimes exercises may need to be modified. In such instances, you will be provided with instructions regarding such modifications at least one week before the exercise will be performed.

3. Laboratory Exercises

You must read each week’s Exercise in the laboratory manual and the corresponding Chapter reading assignment prior to the start of the respective laboratory period. The Chapter reading assignments should be read prior to the Monday lecture. Carefully read the entire “Procedures” section as well as the "Analysis" questions at the end of the exercise prior to the laboratory period to be sure that you are prepared to record data and other information during the exercises.

a. Laboratory attendance is mandatory. Most laboratory exercises, including required clean-up, will require about 3.5 - 4 hours to complete. You are expected to arrive on time, turn in any due assignments immediately after arriving, take the Entrance Quiz, and then begin work as instructed. On most days you may leave as soon as you are dismissed by your Laboratory Instructor. You may ask permission to be dismissed after your group has completed all of the “Procedures” for that exercise including submitting any “Results” and “Clean-up” responsibilities. On occasion you may be required to stay until others in the class are finished; for example, when class data are to be collected and used in the “Analysis” of an exercise.

You will be assigned to work within a group of several (typically 4) students. Groups will be assigned during the second week of the course. You should remain in your same group at the same work area throughout the semester unless your Instructor indicates otherwise. It is important for you to be in the laboratory room at the beginning of the class period. Your Laboratory Instructor may provide additional information pertaining to the exercise at that time, and you will work efficiently as a team only if your group plans together how to proceed before beginning the exercise.

Record all relevant observations and data you obtain while working through the exercise. Each individual within your group should record the information separately, even though for many of the exercises all members of a group will have obtained the same information. Especially be certain that you have recorded information according to instructions provided in the “Procedures” section of the exercise, and that you have obtained sufficient information to answer the questions in the “Analysis” section at the end of the exercise.
b. The Laboratory Instructor will carefully observe your activities as you perform the laboratory exercise and will grade items that you submit each week. Your “Laboratory Performance” grade for the course will be based on these observations, and will contribute substantially (40%) in determining your final course grade (see specific components below).

You will be given an “Entrance Quiz” at the beginning of each laboratory period to test your preparedness and understanding of laboratory details for each week’s exercise. Punctuality and the quality of your work will be recorded. Your attitude and effort will also be observed, along with your adherence to instructions and safety rules. The Laboratory Instructor will assess your progress in obtaining laboratory skills as the course progresses.

Each week the Laboratory Instructor will explain required clean-up activities and will clarify other course obligations as necessary. You may consider the exercise complete only after all clean-up activities assigned to your group have been completed, results have been submitted, and your Laboratory Instructor has given permission for you to leave.

c. The “Analysis” is an integral component of each exercise. If time permits you should begin work on the “Analysis” immediately after completing all components of the “Procedures” section of the exercise. Complete and organize your responses to the questions in the same order that the questions are listed in the laboratory manual and according to specification given by your Laboratory Instructor. Write in complete sentences, using proper grammar and spelling when an explanation is required. Incorporate data into appropriate graphs or tables whenever possible. Submit your prepared responses to the “Analysis” questions at the beginning of your laboratory period in the week immediately following the exercise. Any “Analysis” assignment 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 (see below).

d. Some laboratory exercises conclude with a Supplementary Problem Set. They illustrate the kind of information that you should understand after you complete the exercise. You are not required to answer these questions as part of your “Analysis” and they will not be graded, but they are designed to test your overall understanding of the exercises.

4. Midterm Exam

There will be an evening mid-term exam on October 25 at 7:30 pm covering the material from labs 1-8. Exam rooms to be announced. If you have a legitimate academic conflict with the scheduled evening exam, please contact Dr. Allen to schedule your midterm at a different time.

5. 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 (November 29th – Dec 3rd, 2010). The nature of that examination will be explained in detail during the semester. 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. Practical Exam grades will be normalized to 15 points in calculation of the final course grade.

There will not be a Bio205L final examination during the final exam week at the end of the semester.

Policy on academic integrity: you must maintain academic integrity and submit your OWN work. The University’s policies will be strictly enforced. See <http://deanofstudents.utexas.edu/sjs/>.
Policy with Respect to Absences and Tardy Completion of Assignments

Although attendance is not taken formally during lectures, the CPS questions can only be taken at an appointed time during the lecture period (see Lecture Period information above and additional Class Participation System handout for more information). A missed lecture equates to a missed CPS lecture score and a recorded absence regardless of the excuse (there are NO make-up lectures).

Attendance will be taken during all laboratory periods. If you know in advance that you must miss a regularly scheduled laboratory period during a particular week, then you may fill out the online “Lab Switch Form” to request permission to attend substitute laboratory section for that one week only. Provided the absence is appropriately justified and permission granted, you will receive an email notification as to the substitute laboratory time and room you may attend for that one week. You MUST bring a printed copy of this email authorization with you and present it at the beginning of the laboratory period to the substitute Laboratory Instructor of the section you are authorized to attend for that one week only. You are required to submit your “Analysis” answers from the previous week’s exercise and any other assignments at the beginning of the substitute laboratory period. You will be assigned a group with whom to work during that substitute laboratory period. You must complete any and all assignments (Entrance Quiz, “Data and Result” sheets, Clean-up, etc.) that are given to the other students in the substitute laboratory. The substitute Laboratory Instructor will grade your Entrance Quiz, evaluate your laboratory performance, and provide these scores to your regular Laboratory Instructor along with all assignments that you submit. On the following week you must attend your regularly scheduled laboratory section and submit to your regular Laboratory Instructor your answers to the “Analysis” section based on the results from the previous week. A student who attends a substitute laboratory and completes all assignments on time according to this prescribed policy will not be penalized as having missed the exercise. If you have questions or need assistance with this policy, contact the Laboratory Course Coordinator, Dr. Delia Brownson.

In emergency situations, you may miss one exercise completely without penalty under the following conditions: (a) it is your first missed exercise and (b) you have a reasonable excuse (valid emergency) for the missed laboratory. To ensure your grade is not penalized, you must submit several items as follows. First, write a brief letter of explanation to be given to your Laboratory Instructor at the beginning of the laboratory period immediately following the week of your absence. Also provide an authenticating reference so that the instructor may confirm the reason of your absence (e.g., a “doctor’s note”). Although your absence will be recorded, the “Entrance quiz,” “Laboratory Technique,” and “Clean-up and Accountability” scores will not be penalized for the missed laboratory exercise provided the excuse is valid. Since you will not have been able to collect data or make observations (no “Data and Results” score) to be able to answer the “Analysis” questions, you should obtain data from others in your group (or your Laboratory Instructor) no later than the laboratory period immediately following the week of your absence. Finally, one week later, “Analysis” answers for both the previous laboratory period and the missed exercise should be submitted.

If you miss a second laboratory exercise, immediately contact an Instructor of Record. A student who must miss more than one exercise during a semester should consider dropping the course. There is no mechanism to make up a missed laboratory after the week of the exercise.

The grade for an assignment turned in late will be penalized by 10%. Assignments that are due the beginning of a laboratory period will be interpreted as late if turned in later than 15 minutes after the start of the laboratory period. Assignment will be penalized by an additional 10% for each day late. Any assignment turned in more than one week late will not be accepted for grading, and a "0%" grade will be recorded for that assignment.
Summary of Student Obligations in BIO 205L During a “Typical” Week

Prior to Monday lecture: Read the Chapter reading assignment for that week’s exercise.
Read the exercise, paying close attention to the “Procedures” section.
Review your lecture notes from the previous week’s lecture.

During Monday lecture: Take notes to record information of relevance to the exercises, and of value in retaining information and in preparing for exams.
Note any special announcements pertaining to the course, the current week's exercise, etc.
Expect during the lecture period, CPS questions based on: the last week’s lecture and current week's chapter reading assignment.

Prior to the lab exercise: Read the entire exercise carefully, including “Analysis”.

During the lab exercise: Turn in answers to questions in the “Analysis” section of the previous week’s exercise at the beginning of the laboratory period.
Take the Entrance Quiz.
Perform the exercise in cooperation with other members of your group.
Submit your Data and Results.
Clean up your work area as required and explained by the Laboratory Instructor before leaving the laboratory.

After the lab exercise: Prepare answers to the “Analysis” questions.

Course Evaluation:
Your grade in BIO 205L will be based on several components of the course, listed here along with their relative weight in determining your final grade.

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
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<tbody>
<tr>
<td>CPS-Lecture Questions</td>
<td>10%</td>
</tr>
<tr>
<td>Laboratory Performance</td>
<td>40%</td>
</tr>
<tr>
<td>(Lab Entrance Quizzes)</td>
<td>15%</td>
</tr>
<tr>
<td>(Data and Results)</td>
<td>10%</td>
</tr>
<tr>
<td>(Laboratory Technique)</td>
<td>15%</td>
</tr>
<tr>
<td>Analysis Answers</td>
<td>20%</td>
</tr>
<tr>
<td>Exams</td>
<td>30%</td>
</tr>
<tr>
<td>(Midterm Exam)</td>
<td>15%</td>
</tr>
<tr>
<td>(Laboratory Practical Exam)</td>
<td>15%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>100 %</strong></td>
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More detailed explanations of the grading policy will be provided early in the semester.
**Final Grade Assignment**

We will compute your course final average by summing the total score obtained in individual components of the course. Letter grades will then be assigned according to the following scale:

<table>
<thead>
<tr>
<th>Score Range</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>94.00 – 100.00</td>
<td>A</td>
</tr>
<tr>
<td>90.00 – 93.99</td>
<td>A-</td>
</tr>
<tr>
<td>87.00 – 89.99</td>
<td>B+</td>
</tr>
<tr>
<td>83.00 – 86.99</td>
<td>B</td>
</tr>
<tr>
<td>80.00 – 82.99</td>
<td>B-</td>
</tr>
<tr>
<td>77.00 – 79.99</td>
<td>C+</td>
</tr>
<tr>
<td>73.00 – 76.99</td>
<td>C</td>
</tr>
<tr>
<td>70.00 – 72.99</td>
<td>C-</td>
</tr>
<tr>
<td>65.00 – 69.99</td>
<td>D+</td>
</tr>
<tr>
<td>60.00 – 64.99</td>
<td>D</td>
</tr>
<tr>
<td>55.00 – 59.99</td>
<td>D-</td>
</tr>
<tr>
<td>0.00 – 54.99</td>
<td>F</td>
</tr>
</tbody>
</table>

If you are having trouble in the course, please discuss the difficulty with an Instructor *as early in the course as possible*. It is very difficult to make adjustments late in the semester.

**Please note the following information provided by the Registrar’s office:** <http://www.utexas.edu/student/registrar/>

**September 6 Monday.** Labor Day Holiday.

**August 30 Monday.** Last day of the official add/drop period; after this date, changes in registration require the approval of the department chair and usually the student's dean. Last day undergraduate students may register and pay fees without the approval of the registrar.

**September 10 Friday.** “Twelfth class day”; this is the date the official enrollment count is taken. Last day to drop a course for a possible refund. Last day an undergraduate student may add a course except for rare and extenuating circumstances. Payment due for added courses (add bill).

**September 22 Wednesday.** Last day to drop a course without a possible academic penalty (w/automatic Q).

**October 20 Wednesday.** 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. Remember that you will need your instructor's signature on the drop; and must allow time for this process*. Last day a student may change registration in a course to or from the pass/fail or credit/no credit basis.

*Any drop or withdrawal after October 21st must be for non-academic reasons (e.g., a death in the immediate family or a major illness). If that occurs, you should immediately contact your respective Dean's Office.

College of Natural Sciences students should contact the Student Division of the CNS Dean's Office, WCH 1.106, (512)-471-4536 or online at: <http://cns.utexas.edu/deans-office/undergraduate-education> for help with undergraduate student affairs including registration changes, drop, or withdrawal. CNS’ Secure Web Services, including application for Graduation, are at: <http://cns.utexas.edu/academics/>

You are strongly encouraged to contact your academic advisor in the advising center of your major if you are having problems with any of your courses. See a counselor in your Dean's office immediately if you are having non-academic problems that you believe require special attention.

**November 22-26 Official Thanksgiving holiday is only Thursday-Saturday, but there will be NO Monday lectures NOR laboratory sections during this week.**

**December 3 Friday.** Last class day.