**BIO 206 - General Biology: Molecular and Cellular Laboratory**

**Objectives**

The function of the BIO 206 Laboratory is to help you discover how new scientific information is obtained. Within that scope is the need to develop critical-thinking and problem-solving skills, so important in our way of life. Various procedures examined in this laboratory include: bacterial plating and isolation of ampicillin-resistant colonies, interpretation of the role of β-galactosidase in gene cloning, chromatography, spectrophotometry, electrophoresis, biochemical pathway construction using Neurospora, inheritance in C. elegans, diffusion kinetics, enzyme kinetics, restriction endonuclease digestion of DNA, and plasmid biology.

**Course Objectives**

**Students will:**

1. Understand the basics of experimental design and the scientific method
2. Successfully perform: microscopy (compound and dissecting), chromatography, spectroscopy, gel electrophoresis, sterile microbiological procedures, and enzyme kinetic analysis.
3. Develop an understanding of Mendelian and bacterial genetics, including epistatisis analysis.
4. Test the relationship between genotype and phenotype in a variety of model systems.
5. Understand basic molecular concepts and be able to collect and interpret different types of molecular data.

**Required Text**

*General Biology: Molecular and Cellular Laboratory*, Creighton University.

**Laboratory Policies:**

Students are required to attend each laboratory session. Because information pertaining to each session’s activities is given at the start of each session, students are expected to be on time. Tardiness is disruptive to group members and the laboratory as a whole. Providing repeat laboratory opportunities is technically and logistically prohibitive and will only be attempted under highly unusual circumstances.* Coming to the laboratory prepared to physically and intellectually work through the activities is expected. Failure to attend, to be prepared, and to properly engage in the laboratory will result in considerable penalty as seen in the grading scheme below:

- Unannounced Quizzes = 60 points
- Attendance = 24 points
- Participation and Cooperation = 24 points
- Presentation = 12 points
- Total for laboratory itself = 120 points

*For **authorized reasons only**, a student might be able attend another session later during the **same** week if they are **unable** to attend their normal session. This policy extends only to students who obtain **permission in writing** from Dr. Austerberry. The student must present the written permission to the Teaching Assistants of the substitute section before attendance credit can be given, and must request that those TAs transfer the credit to the TAs of the student’s home lab section. Even if such guest attendance is arranged, there is still no mechanism for making up a missed quiz given in the home lab section.
Attendance Policy
Lab and recitation attendance is required each week, and attendance is taken at each lab period (1 point/lab). You are allowed 2 absences from the recitation sections, after which you will be penalized 5 pts/absence. If you are ill or have a family emergency that prevents you from attending your regularly scheduled lab, you must arrange with a lab instructor or teaching assistant to attend another lab section meeting. In cases of prolonged illness, individual arrangements will need to be worked out with the lab instructor. We will attempt to be cooperative, but do not have unlimited resources, and not all difficulties can be overcome. Our assumption is that you will come to lab fully prepared and appropriately dressed, will perform your lab work conscientiously, and will conduct yourself appropriately at all times. **Please note:** your teaching assistants are authorized to deduct two points per lab if you come to lab unprepared or conduct yourself in an unprofessional manner.

Laboratory Format
This course is a 1 credit laboratory course that consists of a 1 hour recitation section and a 2 hour laboratory per week. The recitation section will provide students with conceptual and technical background knowledge for the laboratory exercises. The 2-hour laboratories are designed to provide students with more in-depth knowledge and experience with basic biological concepts and techniques.

Class Cancellation Policy
Lab will never meet if the University is closed for weather or other reasons on that particular day. If lab is cancelled for other reasons, we will send out an email (to your official campus address) and post a notice on the Blueline course website as soon as we know of the cancellation, or have a Biology faculty or staff member make an announcement in the lab. If a University closure occurs during a scheduled lab exam, we will send and post information on alternative arrangements.

Laboratory Safety:

While the BIO 206 laboratory is not an extremely hazardous place to work, there are some hazards. We work with live microorganisms, hazardous chemicals, open flames, and potentially lethal electrical equipment. Attention to certain safety standards is not only necessary for your protection during the BIO 206 laboratory, it is also important that you develop safe working skills for other life-long activities. We would like you to develop safe habits which will carry over into other courses. We especially wish not to undermine safe habits learned in other courses or activities. Safe behavior is a sign of maturity and respect for the welfare of others.

Proper laboratory attire is an **absolute requirement** for laboratory attendance. Proper attire includes non-baggy pants that extend to the ankles, **socks**, and shoes that cover the foot **completely** (sandals, shoes with wide-open mesh, and shoes that are open on the top of the foot are not acceptable). The torso must be completely covered under all ranges of motion. Under no circumstances are shorts, short skirts, or shirts that expose any part of the torso to be worn in lab. If you lift your hands above your head, there should be no exposed skin below your shoulders. Only neck, arms and hands, and head can be exposed. The most common problem we encounter is students with skin exposed at the lower leg/ankle/top of the feet. The next most common problem is students wearing shorts. Here is a very popular solution to both problems: if you prefer, feel free to wear shorts, sandals, etc. as far as the hallway outside of the laboratory, and bring in your backpack some real socks (not just “footies”), pull-on sweatpants or warm-up pants, and a pair of foot-enclosing shoes. Use the chairs in the hallway to sit down and quickly pull the long
pants over your shorts and put on the socks and shoes. Then, come into the lab. Enter the lab itself after you are properly dressed.

Food, drink, any type of eating utensils, or any evidence of food or drink consumption (wrappers, containers, etc.) are not to be brought into, stored in, or consumed in a laboratory.

Applying cosmetics, lip balm, and inserting or removing contact lenses must be done before entering the laboratory, not in the laboratory.

Appropriate goggles or chemistry laboratory safety glasses shall be worn when there are liquids other than water used in the laboratory. See the schedule on the next page; chemical safety eyewear must be brought to the lab each week indicated with the goggles icon.

Hands shall be washed before leaving laboratories, even if gloves were worn during the laboratory.

Unauthorized persons, including students not enrolled in the course, are not allowed into the laboratory.

Students not conforming to laboratory safety regulations and procedures will be asked to leave the laboratory. Such students will surrender two points for attendance and two points for cooperation for each infraction. Creighton’s Environmental Health and Safety Office posts a set of concise laboratory safety tips at http://www.creighton.edu/admin/facilities/ehs/labsafety

Academic honesty

The University Policy on Academic Honesty applies to all quizzes, examinations, and writing assignments. This policy is explained in the 2010-2011 Creighton University Undergraduate Student Bulletin:

“In keeping with its mission, the University seeks to prepare its students to be knowledgeable, forthright, and honest. It expects and requires academic honesty from all members of the University community.

Academic honesty includes adherence to guidelines established by the University, its Colleges and Schools and their faculties, its libraries, and the computer center. “Academic or academic-related misconduct” includes, but is not limited to, unauthorized collaboration or use of external information during examinations; plagiarizing or representing another's ideas as one’s own; furnishing false academic information to the University; falsely obtaining, distributing, using or receiving test materials; falsifying academic records; falsifying clinical reports or otherwise endangering the well-being of patients involved in the teaching process; misusing academic resources; defacing or tampering with library materials; obtaining or gaining unauthorized access to examinations or academic research material; soliciting or offering unauthorized academic information or materials; improperly altering or inducing another to improperly alter any academic record; or engaging in any conduct which is intended or reasonably likely to confer upon one’s self or another an unfair advantage or unfair benefit respecting an academic matter. Further information regarding academic or academic-related misconduct, and disciplinary procedures and sanctions regarding such misconduct, may be obtained by consulting the current edition of the Creighton University Handbook for Students. However, students are advised that expulsion from the University is one of the sanctions which may be imposed for academic or academic-related misconduct.”

The College of Arts and Sciences policy on questions of academic honesty is found in detail at http://www2.creighton.edu/fileadmin/user/CCAS/docs/acadhonesty.html. Please note that if you are found to have engaged in an act of academic dishonesty in this course you may receive a range of serious penalties, from receiving a 0 for the assignment to receiving an “F” for the course.
BIO 211 Laboratory Schedule

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<td>Lab safety and organization; ideas &amp; methods in science.</td>
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<td>9/5 – 9/8/11</td>
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<td>Session 2: 9/12 – 9/15/11</td>
<td>Record keeping, analytical thinking, microscopy, measurement, calibration.</td>
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<td>Session 4: 9/26 – 9/29/11</td>
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Any student allergic to penicillin or ampicillin should notify your TAs before Laboratory Session #4