

Bio. 150: Introduction to Biological Inquiry
Biological responses to stress
Fall 2004

Professor Leslie Gregg-Jolly

Room 1206, ext. 4978

Email: Greggjol@grinnell.edu

Office hours: Tues. 2:00 – 3:00 pm

Fri. 1:15 – 2:00 pm

or by appointment

Technical support: Carolyn Bosse (Bosse@grinnell.edu), Room 1109, ext. 3023

List serve: bio150-lgj-f04@lyris.grinnell.edu

Website: <http://web.grinnell.edu/courses/bio/f04/bio-150-03/>

Course description:

In this course, we will investigate ways that biologists seek to understand how organisms can interact with their environment and change in response to varying environmental conditions. Since microbes are excellent model systems for biological inquiry, their response to stressful environments will be emphasized. Students will formulate hypotheses regarding stress responses, design and conduct experiments to test their hypotheses, and communicate the results of their experiments. The class will have three, one hour and fifty-minute meetings per week that combine lab, lecture, and discussion.

Specific goals:

Through the activities described above, we hope that students will gain an understanding of how biologists ask questions, test their ideas and communicate their work. Unlike more conventional introductory biology courses, there are no prescribed topics or amounts of information that need to be covered. While it is expected that you will learn much information, the nature of this course will focus on your development of the understanding of the process of biological inquiry. Besides broadening your perspective on how people make sense of the natural world, this course should prepare you well for more advanced work studying biology and biological chemistry.

This new way of teaching introductory biology is funded in part by grants for external agencies such as the National Science Foundation and the Howard Hughes Medical Institute. Part of our obligations for this funding include determination of how well this approach works to help students learn. We appreciate your participation in activities that will be used for this assessment of the course.

Course materials:

Since your investigations into stress responses will influence what topics are studied in the course, a specific textbook has not been selected. Instead, you will utilize multiple resources. There are several copies of the introductory textbook "Biology, Sixth Edition" by Campbell and Reece available on reserve in the library. There will be several assigned readings in this text. There is also a special shelf of reference biology texts available in the science library. As you go in the science library, the biology reference texts are on your left near the new journals. Other materials will be made available on reserve in the library, in the laboratory, or through our course

website. Copies of some information will be distributed in class. You should be prepared to make your own copies of some materials and download others.

Investigations: A Handbook for Biology and Chemistry Courses has been prepared by the Grinnell College Biology and Chemistry faculty and you will be given a copy. It is expected that you will read this handbook carefully and apply the relevant information to your work in this course. You also need to purchase a notebook that is bound **and** a three-ring binder. These items are available at the bookstore.

Course work:

A wide variety of formats of coursework will be graded. To highlight the importance of scientific communication, oral and written communication skills will be emphasized. Major assignments will include a public poster session on Dec. 9 and a major paper written in the scientific format, due November 29. A final exam covering specific information as well as your general understanding of the scientific process will be given on Monday, December 13 at 9:00am. Less significant quizzes and written assignments will be given throughout the semester, approximately weekly. Participation in discussion and lab citizenship are other components of the grading system. Also note that since science is a collaborative process, a significant portion of graded work will be completed in groups. In order to pass this course, a student must have an average above 65% in both group work and in work performed independently.

Grading scheme:

Quizzes and short assignments	40%
Lab citizenship & discussion	10%
Final Project Paper	20%
Final Project Poster	10%
Final Exam	20%

Grades will be assigned on the following scale. At my discretion the grade may be raised for reasons such as significant improvement during the course of the semester. There is no "curve" and your grade will not be decreased below that designated based upon percentage points earned. For example, at least a B will be awarded for a student who earned 87%.

93-100%	A	77-80%	C+
90-93%	A-	70-77%	C
87-90%	B+	60-70%	D
83-87%	B	below 60%	F
80-83%	B-		

Please note that attendance and participation in lab and lecture are required. If student work must be missed due to an excuse verified through the health center or the student affairs office, the work will generally not be made up; the total number of points available to you will be reduced and your course grade will be determined by the percentage of the available points which you obtained. Exams or in class assignments missed without a verified absence will be graded as 0 points. If accepted, lecture or lab assignments turned in after the deadline will be downgraded 5 points or one grade for each day late. If an assignment is due at the beginning of class and you are late for class, your assignment counts as one day late.

General course outline:

Week of:	Major activities:
8/30/04	introduction to the relationship of genotype to phenotype introduction to lab and utilization of the literature testing the effect of the environment on survival
9/6/04	changing the genotype of an organism genetic transformation and isolation of plasmid DNA
9/13/04	introduction to how to read a scientific paper quiz restriction digests and gel electrophoresis
9/20/04	gel analysis scientific writing
9/27/04	reading primary literature counting cells and measuring survivorship
10/4/04	quiz scientific writing & peer review counting cells and measuring survivorship reading primary literature
10/11/04	papers due introduction to microscopy
10/18/04	BREAK
10/25/04	review gene regulation writing quiz
11/1/04	presentations on various stresses project planning
11/8/04	begin projects
11/15/04	introduction to biofilms presentations on project design
11/22/04	projects scientific writing Thanksgiving
11/29/04	Paper due
12/6/04	Posters and course wrap-up
FINAL EXAM: 9:00am Monday December 13	