

Developmental Biology Lab

**Biol 351 Lab – Spring 2008 Wednesdays, 9-11:50 am, 1:00 – 3:50 p.m.
Loyola Hall 015**

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Office Hours: M, 11am-12 pm; Th, 10-11 am.

Teaching Assistants:

Introduction:

The laboratory portion of Biology 351 will focus on four major developmental systems: cellular development in the sea urchin embryo, and organogenesis in the zebrafish, amphibians, and the chick. We will explore some of the techniques used to gain a better understanding of the process by which multicellular organisms develop from a single fertilized egg. We will also discuss the molecular events that accompany the morphological changes in the embryos that you observe. In most of these exercises, you will be observing developmental processes in living organisms. Because of the time required for an individual organism to grow and develop, this lab will require that you spend some time making observations outside of the regularly scheduled lab period.

Goals and Objectives for Biology 351 Lab:

Upon completion of this laboratory course, students will be expected to:

1. Describe developmental processes in four model organisms, emphasizing both the similarities and differences inherent in the development of these organisms.
2. Demonstrate competence in utilizing techniques historically employed by developmental biologists to observe and interpret the changes that occur in an organism during embryonic development
3. Apply concepts of cellular biology, teratology, or ecology to experimental studies on animal development in a written lab report.
4. Use your knowledge of developmental biology and the scientific process to design a research experiment, perform the experiment with appropriate experimental controls, and interpret and report your results.
5. Write a comprehensive report that integrates knowledge obtained from four model organisms into a discussion of the underlying principles of developmental biology.

Grading Policy:

Independent grades are assigned for the laboratory and lecture portions of Biology 351. Your lab grade will be based upon the following criteria, weighted by the percentages indicated in the parentheses:

Mini Lab Reports	80 to 100 pts.	(25%)
Final Report	80 pts.	(25%)
Lab Exam and Discussion I	70 to 100 pts.	(20%)
Lab Exam and Discussion II	70 to 100 pts.	(20%)
Quizzes	10-15 points each	(10%)
Attendance	See "Attendance Policy"	

Grades will be based upon the total points earned versus the total points possible for each category, and grades will be weighted accordingly. Your final grade will be determined by the following scale:

<u>Percentage</u>	<u>Grade earned</u>	<u>Percentage</u>	<u>Grade earned</u>
94-100	A	73-76.99	C
90-93.99	A-	70-72.99	C-
87-89.99	B+	67-69.99	D+
83-86.99	B	60-66.99	D
80-82.99	B-	<60	F
77-79.99	C+		

Below is a description of each of the criteria that will determine your grade and what is demanded in order for you to receive the highest score possible.

Lab Exams

Two exams will be given, covering the materials and techniques introduced in lab. The first exam will take place on **March 7**, and the second on **May 2**. These will be written exams. Each test will have multiple choice, fill-in-the-blank, or one-sentence definitions, and short answer and essay questions that will require significantly more writing. These also will be based entirely on material covered in lab. Review pointers will be distributed prior to the exam. Following the written portion of the exam, students will have brief oral presentations of the labwork presented in a lab meeting format. You will be graded on these presentations as part of your exam grade. The exams will be about 100 points each.

Quizzes

All of our experiments will involve live animals; thus it is crucial that you have a clear understanding of the rationale and protocols involved with the experiments. At the beginning of selected laboratory periods, we will have a quiz to ensure that you are familiar with the protocols and procedures, and that you will not cause unnecessarily mortality in the animals. Quizzes will be 10 to 15 points each.

Mini Lab Reports (20 points each)

The mini-lab reports will be a graded weekly record of your laboratory activities. This is especially important because many of the activities that you will actually conduct will be done OUTSIDE of class time. You MUST submit your lab reports on time. Late submissions incur an automatic "0" score.

Final Report (80 points)

The final lab report will be an overall summary of all your work throughout the semester. This report will not follow the standard "lab report" format; it will be more similar to a term paper, but with your laboratory experiments and mini-lab reports as the source of all the primary data and information.

Digital Submissions

You are required to use Angel for submission of your written work. You may use any common word processing format for your work, but MS Word, Rich Text Format, or Adobe Acrobat (PDF) are preferred; If you are having trouble incorporating your illustrations into your document, you may opt to submit your written text digitally and then hand in your appropriately labeled figures separately.

Attendance

Attendance is required for every laboratory exercise. Attendance will be taken! Each unexcused absence will result in the lowering of your course grade by 1/2 grade (i.e. A to A-, B- to C+, etc.), as well as the loss of all potential points for assignments pertaining to that lab. For an absence to be excused, it must be approved by the instructor prior to the laboratory period, or approval must be sought through the submission of a written excuse signed by a physician, parent, or other person of authority. The written excuse must contain a phone number for contacting the person. If an excused absence occurs, a writing project will be assigned as a lab make-up. The assignment must be completed in order the absence to be considered excused, and for no grading penalty to occur.

Please arrive at your lab section having read the material assigned for the lab exercise for that week. Be familiar with the techniques to be followed in carrying out the lab exercise, and identify any

details of the procedure that are poorly explained or are unclear. Please take advantage of the opportunity to ask questions at the beginning of each lab. Come prepared with questions! We will be working with "live animals", and I do not want to make any unnecessary sacrifices or cause unnecessary deaths, so please make sure you are prepared.

POLICY ON ACADEMIC DISHONESTY

I HAVE A ZERO TOLERANCE POLICY FOR ACADEMIC DISHONESTY! That means that if you are caught violating the Academic Code (cheating, plagiarism, false reporting), **YOU AUTOMATICALLY FAIL THE COURSE.**

All graded work that you turn in must be written by you. Performing each lab is a cooperative effort, with a significant amount of interaction, discussion, and collaboration. This is an important part of the lab experience. *But, all writing resulting from the lab is to be an individual assignment.* If duplicate lab reports are submitted, **BOTH** authors will be considered as violators of the academic code of honesty. In addition, plagiarism of published materials will not be tolerated. Any assignment that contains plagiarized material will be considered as violators of the academic code of honesty

Schedule for the semester

	<u>Date</u>	<u>Exercise</u>	<u>Quiz?</u>	<u>Lab Report</u>
	30-Jan	Course Intro, Microscopy Review, making tools for Developmental Biology		
1	6-Feb	Planaria and hydra		Lab 1
2	13-Feb	Introduction to the Urchin	Yes	
3	20-Feb	Urchin Individual Experiments		Lab 2 & 3
4	27-Feb	Fish: Individual experiments/sea urchin replicates	Yes	
	5-Mar	catch-up for experiments		Lab 4
	12-Mar	Lab Exam I		
	19-Mar	SPRING BREAK		
5	26-Mar	Chick	Yes	
6	2-Apr	Chick experiments I		
7	9-Apr	Chick experiments II	Yes	
	16-Apr	catch-up for experiments		Lab 5-7
	23-Apr	Lab Exam II, lab discussion		
	30-Apr	no class (Monday sked)		
	7-May	no class		
	12-May	Final Report Due		