

Developmental Biology Laboratory
BIOL 3100
Fall Semester 2014

Time: Wednesday 2:00 - 4:50 PM, plus open lab as needed

Location: WO 1214

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Office Hours: TW 9:30-11 am or by appointment

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Office Hours: T,Th 3:00-5:00 pm

Required Text: None. Handouts will be provided for each week's lab through Blackboard. Click on your Developmental Biology Laboratory course and then look under the "Lab Handout" tab. The weekly lab exercises will be posted by no later than the Monday prior to each lab. The files are in pdf format. Please be sure to print out and bring a copy to the lab, as no extra copies will be available from the instructor or TA.

Corequisite/ Prerequisite: BIOL 3090. You must be currently enrolled in or have taken Developmental Biology.

Scope of the course:

This course has two objectives. The first is to introduce you to some of the observational and experimental methods used for analyzing developmental events. The second objective is to apply the observations and experiments involving living and/or fixed embryos to the illustrate and exemplify the concepts and events of development. This second objective requires that you have some familiarity with these concepts and events. Since we will not have the time, *in this course alone*, to discuss them in depth, it is strongly suggested that you take BIOL 3090 concurrently. You will also find that particular laboratory exercises in this course are often illustrative of the specific topics discussed in BIOL 3090.

The course has been loosely organized into three types of laboratory exercises. One type involves focusing on the anatomical organization and structure of specific developmental stages in embryos. A second type involves the use specific experimental techniques to explore fundamental concepts in development. Finally, towards in the last part of the semester there will be a "project lab" where you, as groups, will carry out a small scale research project over several weeks.

Experimental Developmental Biology:

Two general methods have been used by experimental scientists to probe the functioning of developmental processes in the laboratory. Experimental embryologists perturb embryonic development by physical or chemical means, while developmental geneticists use mutations and other genetic alterations to interfere with normal development. In general the former experiments focuses on cellular interactions, the latter on the genetic program that controls developmental events. In addition, a close understanding of normal developmental, gained by careful observation, is essential for interpreting the results of experimental manipulations. In this course some lab exercises will be primarily observational, some will involve the direct manipulation of embryos, and some will involve the genetic manipulation of embryos.

Expectations: You are expected to show up to lab at the regularly scheduled time. Since we are often working with living material that has its own intrinsic developmental clock, many of the exercises will require that you also come in during open lab times to complete your observations or to perform a procedure. We will try to schedule these open labs to fit everyone's schedule.

For each lab, there will be a handout, and will be available for download from the website by Monday prior to the lab. It is strongly recommended that you read over the weeks lab guide before coming to lab.

Recommended supplementary readings will be indicated on the weekly laboratory guides. The TA will have copies of the readings available, if you wish to photocopy them.

Lab Write ups and Quizzes:

Some laboratory exercises can be better evaluated via write-ups and some by quizzes. Although we currently plan on 6 write-ups and 4 quizzes, we reserve the right to substitute a quiz for a write-up or vice versa. You will always know in advance whether you will need to hand in a lab report or take a quiz the week following the completion of a given lab exercise. You will never need to do both. Some weeks you will not have to write a lab report or quiz because the exercise takes more than a single week. This will be noted in your handout for the given exercise.

The write-up is modeled on the outline of a scientific research paper. These should be in the form of a report with 3 sections:

- 1) Introduction: What were the goals of the exercise? What developmental question is being investigated/observed?
- 2) Procedures and Results: What did you do and observe? You should include drawings, graphs, or measurements in this section.
- 3) Discussion: What do these results tell you?

If you need to see examples look in any scientific journal. (Usually procedures are in a separate section from results.) The lab guide will typically contain questions that you should use to guide your write up. You should attempt to include the answers to these questions in the appropriate section of the write up. Write ups are due the Wednesday following the completion of the lab exercise, and can be dropped off with the TA. Lab exercises that take more than one week to complete require only a single write up, after all experiments are completed. The final write up of the semester is due Wednesday, December 17th.

Late lab reports will be downgraded 5% for each day late.

Please limit yourself to 4 pages maximum (6 for the final lab report) Please, no handwritten reports, they are difficult to decipher!

Each lab report is worth 15 points, with the exception of the final lab report, which is worth 25 points.

There will be 4 lab quizzes on weeks that no report is due. The dates will be announced at least one lab period in advance. Quizzes will be held at the start of lab the week after a lab without a write up. They will last from 10-20 minutes. Each quiz is worth 15 points. There will be no make up quizzes, if you miss one, its gone.

Grading: Your grade is based on the lab write-ups (55%), the lab quizzes (25%), and participation (20%). This last includes showing up for lab, making an effort to competently perform the lab exercise, coming in to open labs when necessary, and when involved in team exercises, contributing to the team. For an A you will need to score 90% or better, 80% to 90% for a B, 70 to 80% for a C, and 60 to 70% for a D, below 60% is an F. If you are within 2-3% points of a borderline, you will receive a + or - grade.

Please note: The last day to withdraw from the course is October 31. After that date, drops *cannot* be given.

Academic Honesty.

The University of Toledo has specific policies regarding academic dishonesty. Please read the following Statement of Academic Dishonesty.

<http://www.utoledo.edu/policies/academic/undergraduate/pdfs/3364-71-04%20%20Academic%20dishonesty.pdf>