

ZOO 4603

Embryology/Development

Spring 2005

Instructor

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Class Times

Lectures: BL 209
Section 1: TR 9-10:15AM
Laboratory: BL 304
Section 11: TR 2:30-4:20PM
Section 12: TR 4:30-6:20PM

Course Description

We will study the mechanisms of morphological changes during development in animals. Examples of developmental processes in several animal model systems will be considered. The cellular, molecular, and genetic basis of the different stages of animal development, from gametogenesis to organogenesis, will be examined. The study of plant development, as well as the mechanisms of developmental change in protists and fungi, will also be introduced. The laboratory will consist on the examination of different stages in embryonic development in frog and chick. We will also do experiments with several organisms representing model systems used in the study of developmental processes.

Resources

Class textbook: Developmental Biology, 7th edition, by S. F. Gilbert. Sinauer, 2003.
Textbook website: <http://www.devbio.com>.
Laboratory manual: Atlas of Descriptive Embryology, 6th edition, by G. C. Schoenwolf and W. W. Mathews. Prentice Hall, 2003. A copy is available on reserve in the library.
Class Website: <http://biology.ucf.edu/~wsotero/zoo4603/>. All lecture figures, laboratory guides, and exams scores will be posted here. You are strongly encouraged to obtain printouts of all lecture and lab files prior to each meeting and to bring them with you.

Grading

There will be three lecture exams (100 points each), two embryology laboratory exams (70 points each), and the experimental laboratories exam (60 points). If you take the optional cumulative final exam you will be able to drop the lowest lecture exam score or make up for a missed lecture exam. The score distribution will be as follows:

Lecture exams (3):	300
Embryology laboratories exams (2):	140
<u>Experimental laboratories exam (1):</u>	<u>60</u>
Total:	500

Final grading will be based on a percentage basis as follows:

90-100%: A, 80-89%: B, 70-79%: C, 60-69%: D, below 60%: F.

Note: Because of the nature of laboratory tests there will be no make-up laboratory exams, so be sure not to miss any of them. Talk to the instructor *before the day of the test* if you need to miss any exam (lecture or lab) to schedule an *alternate* test at a different time (you may be asked to present justification).

Attendance

Attendance to the lectures and laboratories is strongly encouraged. The topics to be discussed in class will not be limited to those found in the textbook. Unless otherwise indicated, only the material covered during class will be included in the lecture exams. For the same reasons, attendance to laboratories is also strongly encouraged.

Attendance to experimental laboratories is compulsory. Every unjustified absence from these labs will result in the reduction of 2% of the *final score*.

You may only attend the lab for which you are enrolled and only during the scheduled times. Under special circumstances you will be allowed to attend the other lab but only with permission from the instructor and only if there is room available. For some experimental laboratories you will have the opportunity to return at specially scheduled times to record your observations.

Supplementary Materials

You will be provided with a complete set of slides (prepared specimens) for your use in lab during the entire semester. Please handle with care all slides, microscopes, and every piece of lab equipment that you use. Always carry the microscopes using both hands. Please ask your instructor for help if you need assistance with the proper use of the microscope. Open the slides box only after laying it on your bench, otherwise they may fall off and break. If you damage a slide you may be required to replace an entire set (\$50 and up). You may be held financially responsible for any equipment that you break or damage because of your own negligence.

Policy on Academic Conduct

All students attending this course are expected to follow specific guidelines for conduct during lectures and laboratories. Please arrive on time to class and avoid leaving before class is over. As a courtesy to everyone in the classroom, *please turn off all cell phones*, beepers, pagers, portable players, tape recorders, or any other noise-making devices during lectures and exams.

All exams will be offered during the regularly scheduled class or laboratory times, and at the regularly assigned class or laboratory rooms. The final exam will be offered during final exams week (see schedule). You must take all exams during scheduled times and at the assigned rooms. All test papers and scantron sheets must be turned in by the scheduled end of the exam time. If you arrive late, you will be allowed to take the exam but you will be required to finish by the scheduled time. If you arrive late to a practical laboratory exam you will miss some questions, and they will not be repeated for you. You may not have calculators, textbooks, notebooks, or anything other than pens or pencils with you or on your desk during exams.

All students are expected to follow the standards for conduct established by the University of Central Florida in The Golden Rule (<http://www.ucf.edu/glodenrule/>). No disruptive or distracting behavior will be allowed during class or exams. No form of disrespect to the instructor or to classmates will be tolerated. Academic dishonesty (cheating, copying from neighbor, plagiarism, etc.) will be penalized. If you are found cheating you will receive a zero in the exam and will be reported to the student judicial system for disciplinary action. Any form of disruptive behavior or academic dishonesty may result in judicial action (see Student Responsibility section in The Golden Rule).

Laboratory Schedule

Week	Dates and Topics	References ¹
1	Jan 13: Introduction and distribution of slides. Body plans.	
2	Jan 18-20: Frog cleavage, blastula, gastrulation, and neurulation	78-96
3	Jan 25-27: 4 mm frog.	97-105
4	Feb 1-3: 7 mm frog.	106-116
5	Feb 8-10: 10 mm frog.	117-123
6	Feb 15: Review for exam 1. Feb 17: Exam 1 (frog).	
7	Feb 22-24: Chick gastrulation.	134-144
8	Mar 1-3: 33 hr chick.	145-152
9	Mar 8-10: 48 hr chick.	153-170
10	Spring break	
11	Mar 22: <i>Experimental laboratory</i> : Set up planarian regeneration. Mar 24: <i>Experimental laboratory</i> : Live chick embryos.	handout handout
12	Mar 29-31: 72 hr chick.	171-187
13	Apr 5: Review for exam 2 Apr 7: Exam 2 (chick).	
14	Apr 12-14: Finish planarian regeneration. Apr 12: <i>Experimental laboratory</i> : Sea urchin fertilization and early development. Apr 14: <i>Experimental laboratory</i> : Cellular slime molds.	handout handout
15	Apr 19: Exam 3 (all experimental laboratories).	

1. Schoenwolf and Mathews, 6th ed.

Optional Resources

The following optional resources are on reserve at the UCF main library (Periodicals, 3rd floor):

Laboratory Studies of Vertebrate and Invertebrate Embryos, eighth edition, by G. C. Schoenwolf. Prentice Hall, 2001. Also available at the University Bookstore. Contains useful discussions and additional figures to study frog and chick embryo development.

Embryology: ZOO 4603 (VHS tapes). This is a series of taped laboratory discussions by Dr. James Koevenig. Not available at the University Bookstore.

Embryo CD Color Atlas for Developmental Biology, by G. C. Schoenwolf. Prentice Hall, 1997. Out of Print, not available at the University Bookstore.

aCross Development: Puzzles To Accompany Scott Gilbert's Developmental Biology 6th Edition, by K. W. Tosney. Sinauer, 2000. Not available at the University Bookstore.