



ZOO 4603
Embryology/Development
Spring 2015



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 animal development through different stages, from gametogenesis to organogenesis, will be examined. The study of plant development will also be introduced. The laboratory will consist of the examination of different stages in early embryonic development in frog and chick. We will also do experiments with several living organisms representing model systems used in the study of developmental processes.

Instructor:

Dr. Walter Sotero-Esteve
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Phone #: 407-823-4848
Office: Bio 202 B
Office hours: MoWeFr 10:30-12

Class Times

Lectures: Bio 209
Section 0001 (12578): TuTh 10:30-11:45 AM
Laboratory: Bio 304
Section 0011 (12579): TuTh 1-2:50 PM
Section 0012 (12580): TuTh 3-4:50 PM

Lab Teaching Assistant: *Rogério Ferreira*

References

Lecture textbook: Developmental Biology, 10th edition, by S. F. Gilbert. Sinauer, 2013.

Laboratory manual: A Photographic Atlas of Developmental Biology, by S. J. Wright. Morton, 2005. This lab manual is required.

Supplemental materials: all lecture figures and laboratory guides will be posted on Webcourses (the "Files" section of your ZOO4603C-15Spring course at webcourses.ucf.edu). You are encouraged to download all lecture and lab files prior to each meeting and to bring them with you to class or lab.

Grading

There will be three multiple-choice lecture exams (100 points each), two laboratory exams (100 points each), and a comprehensive lecture/lab final exam (100 points), for a total of *six* exams. You will receive a score of 0 for any exam that you miss. Make-ups for lecture exams may be given under special circumstances, but the instructor will ultimately decide the merit of each case. Because of their format, there can be no make-up laboratory exams, so be sure not to miss any of them. All exam scores will be posted on Webcourses (webcourses.ucf.edu). There will be no additional examinations, assignments, or extra credit. The lowest of your *six* exam scores will be dropped and will not count toward your final grade. For example, if you take the five regular exams and choose not to take the final exam, you will receive a score of 0 on the final exam but that score will be dropped and will not count toward your final cumulative score.

The following formula will be used to calculate your final cumulative score: sum of your *five* highest exam scores/5. Results ending in .6 or a higher decimal round up to the next whole number. The following scale will be applied to determine your final grade: 90-100: A, 80-89: B, 70-79: C, 60-69: D, 0-59: F.

The scores of the Diagnostic Exam (Exam 0) and the online Practice Quiz (see the “Attendance” section on page 4) will not count toward your final grade. The dates for the laboratory exams are listed on page 3.

Lecture Exams Schedule

Exam 1: February 12

Exam 2: March 24

Exam 3: April 23

Comprehensive Lecture/Lab Final Exam

May 5, 10-12

Session Calendar and Schedule of Lecture Topics for the Spring 2015 Semester

The Spring 2015 session begins on Monday, January 12th and ends on Monday, April 27th. There will be no class on March 10th & 12th. The following schedule of topics may be subject to modification. *Textbook*: Gilbert, 10th ed.

Topics	Textbook Chapters
Developmental anatomy and specification	1
Gametes & fertilization	4
Early development in invertebrates	7, 5
Early development in amphibians	8
Early development in birds and mammals	9
Ectodermal derivatives	10, 11
Mesodermal and endodermal derivatives	12, 13
The tetrapod limb	14
Sex determination and germ line differentiation	15, 17
Postembryonic development	16
Early development and axis specification in <i>Drosophila</i>	6
Introduction to plant development	www.devbio.com

Laboratory Equipment

You will be provided with a complete set of microscope slides (prepared specimens) and a compound microscope 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. 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). Always carry the microscopes using both hands. Ask the instructor for help if you need assistance with the proper use of the microscope. You may be held financially responsible for any equipment that you break or damage because of your own negligence. The student seating on your station in the other lab section will also use your assigned equipment. Notify the instructor immediately if you find any damaged supplies.

Laboratory Schedule for the Spring 2015 Semester

The following schedule of topics may be subject to modification.

References: Wright, S. J. A Photographic Atlas of Developmental Biology. Morton 2005.

Week	Dates and Topics	References
1	Jan 15: Introduction and distribution of slides.	handout
2	Jan 20-22: Frog cleavage, gastrulation, and neurulation.	77-80 95-96 109-115
3	Jan 27-29: 4-mm frog.	143-150
4	Feb 3-5: 7-mm frog.	156-161
5	Feb 10-12: 10-mm frog.	162-169
6	Feb 17: <i>Experimental laboratory:</i> Sea urchin fertilization and early development. Feb 19: <i>Experimental laboratory:</i> Live frog embryos.	handout handout
7	Feb 24: Review for exam 1. Feb 26: Exam 1 (frog embryology).	
8	Mar 3-5: Chick cleavage, gastrulation, and neurulation.	80-83 96-101 116-123
9	Spring break.	
10	Mar 17-19: 33-hr chick.	171-191
11	Mar 24-26: 48-hr chick	194-199
12	Mar 31: <i>Experimental laboratory:</i> Set up planarian regeneration. Apr 2: <i>Experimental laboratory:</i> Live chick embryos.	handout handout
13	Apr 7-9: 72-hr chick.	201-209
14	Apr 14: Review for exam 2. Apr 16: Exam 2 (chick embryology).	
15	Apr 21: Finish planarian regeneration. Checkout.	

Studying for Lab

With the exception of the four experimental laboratories (see the “Attendance” section on page 4), attendance to labs will be optional. On regular weeks, the Tuesday lab session will begin with a lecture describing the objectives for the week. After that, students will proceed to examine prepared specimens for the remaining of the lab time for that week. Students may study individually or in small groups. The time spent at the lab is entirely up to the student’s discretion. However, be mindful of the fact that your results in the lab exams will correlate with time spent in lab. Do not overlook the importance of doing the time in lab. Many students in the past have performed very well in the lecture exams but have missed out on earning a good grade because they did not put enough effort in their lab work. Remember that the lab will amount to 40% of your final grade.

You will be examining prepared specimens of sequential stages of frog and chick embryonic development. Most of these specimens will be two-dimensional sections. When studying, do not attempt to merely memorize the structures of individual sections. Instead, always keep track of the position of each structure within the three-dimensional embryo, their origins, and how each structure (and the entire embryo) changes over time.

Attendance

All faculty members are required to document students' academic activity at the beginning of each course. In order to comply, please take the **Practice Quiz** on Webcourses by January 16. *Failure to do so will result in a delay in the disbursement of your financial aid.*

The instructor will not keep record of student attendance, but attending the lectures is strongly encouraged. The topics to be discussed in class may not be limited to those found in the textbook, and not all sections from the reference book chapters will be covered in class. *Only the topics covered during class will be included in the exams.* Please show respect for the instructor and your classmates by arriving on time to class and by staying until the lecture is over. As a courtesy to everyone in the classroom, please silence your phones and any noise-making devices during lectures and exams.

All exams will be offered during regular class times, except for the final exam. If you arrive late on any exam day, you will be allowed to take the exam but you will be required to finish by the scheduled time. However, *once the first student has finished the exam and left the room, no other students will be allowed in to begin the exam.* The format of the lab exams will consist of a slide show and questions from the instructor about the specimens photographed on each slide. The lab exams will begin on time and will not restart for anyone who arrives late. You may not have any visible communication devices with you during exams. You may not use calculators that can store information. Please choose appropriately between right and left-handed desks.

Attendance to the four experimental laboratories is mandatory. Each unjustified absence from these labs will result in the reduction of 2% of your *final cumulative score*. You may only attend the lab section for which you are enrolled and only during the scheduled times.

Academic Integrity

As a UCF student, you are expected to be familiar with and follow the standards for conduct established by the University in the *UCF Golden Rule Student Handbook* (goldenrule.sdes.ucf.edu/handbook). No disruptive or distracting behavior is allowed during classes or exams. No form of disrespect to the instructor or to your classmates is tolerated. Promoting or engaging in academic dishonesty in any form (cheating or enabling cheating) will be penalized. Do not write the answer letters on the side of the exam pages. This will be considered enabling cheating and will carry an automatic four-points deduction from your exam score. Any violations to the standards of conduct may result in judicial action, which could result in expulsion from the University. At a minimum, violations of these rules may result in a record of the infraction being placed in your file.

You are responsible for knowing all course rules and policies. The instructor has the ultimate authority to determine the correct interpretation of the contents of this syllabus.

