

ZOO 4603C - Embryology & Development - Fall 2014

Section 0001: WF 09:00 - 10:20 am Lecture (BA1-214)

5 Credits

Section 0011: WF 11:00 - 01:00 pm Laboratory (BIO 304)

Instructor: Dr. Cynthia Bayer

Office (BIO 202D) Hours: Tue 1:00 - 2:00 pm

Email: Webcourses@UCF

Wed 1:00 - 3:00 pm

Phone: 407-823-1460

Fri 1:00 - 3:00 pm

Course objectives: We will study the mechanisms of morphological change during animal development considering examples of developmental processes in several animal model systems. The cellular, molecular, and genetic basis of animal development through different stages, from gametogenesis to organogenesis, will be examined. The laboratory will consist of microscopic examination of different stages in early embryonic development in frog and chick. We will also observe and conduct experiments with several living organisms representing model systems used in the study of developmental processes.

Prerequisites: A grade of C or better in PCB 3063 (General Genetics) and PCB 3023 (Molecular Cell Bio) or PCB 3522 (Molecular Biology I). Some topics covered in PCB 3063 and PCB 3023 may be reviewed briefly in this course, but not discussed in depth.

Required Textbooks:

Developmental Biology, 10th ed. Scott F. Gilbert, 2014. Sinauer Assoc. Inc. Publ. www.sinauer.com
Available as Casebound (hardcover), binder ready Looseleaf Textbook, or as an eBook.
Casebound - ISBN: 978-0-87893-978-7 Student price at website: \$121
Looseleaf - ISBN: 978-1-60535-192-6 Student price at website: \$78

A Photographic Atlas of Developmental Biology. Shirley J. Wright, 2005. Morton Publishing
Looseleaf - ISBN: 978-0-89582-629-9 <http://www.morton-pub.com> price: \$68

Required i>clicker: We will be using the i>clicker classroom response system on a regular basis. You will need to purchase an i>clicker remote and bring it with you to every class lecture. It would be wise to bring extra batteries as well, as we will be using the remotes in activities that count for class points. The purchase of a remote is NOT optional; it will be used as an integral part of this course. *Note: Students need purchase only one remote because the same unit can be used in every course that uses the i>clicker system.* After you purchase your remote, you must register it no later than **August 27, 2014. TO REGISTER:** Log into your **Webcourses** account. Choose our course and click on the i>clicker link. Follow the instructions to type in your clicker ID (which is directly under the barcode on the back of your remote). You may use either the original multiple choice-only **i>clicker**, **i>clicker+**, or the alphanumeric-capable **i>clicker2** remote, as I will only utilize multiple-choice responses to questions in this course.

Course website & Communication: Access our course website at Webcourses@UCF via the myUCF portal using your NID and NID password. There you will find a folder of **Lecture PPTX** and **Lab Handouts** for you to print and bring to lecture and laboratory sessions. I will use the **Inbox** link to the **Conversations** page at our Webcourses site for communication with students.

Classroom Conduct: By enrolling at UCF, all students have agreed to abide by the *Golden Rule*. Please become familiar with this document at: <http://www.goldenrule.sdes.ucf.edu/> It is assumed that all students will act in a mature manner in the classroom showing consideration for their peers and the instructor. Please also use common courtesy in class by arriving and departing on time, refraining from talking during class, and silencing cell phones and other electronic devices.

Grading: 90% = best 5 out of 6 lecture/lab exams
10% = i>clicker points - class participation = 3pts.
- graded questions, correct = 1 pt. incorrect = 0.25 pt.

There will be 3 lecture exams, 2 laboratory exams, and a comprehensive lecture/lab final exam, each worth 100 points. Lecture exams will be based only on material covered in lecture, which includes topics not covered in the textbook. Some notes and diagrams presented in lecture are not included in the PowerPoint slides available at the Webcourse website. Therefore, students who routinely skip lectures will be at a significant disadvantage. Lab exams will test your knowledge of the prepared specimens observed during laboratory sessions, and your exam grade will reflect the amount of time you spend in lab studying these specimens.

Exam scores will be posted on the Grades page at the Webcourses site. 90% of your course grade will be based on the **best 5 out of 6** exam scores. The score of the final exam will be dropped if it turns out to be the lowest of your scores, or you may choose not to take the final exam. The points earned from i>clicker class participation and graded questions will comprise 10% of your course grade. Flat letter grades for the semester will be awarded according to the scale below. These grade ranges will be strictly adhered to with no exceptions. **NOTE: this is a 5-credit course.**

90-100% = A, 80-89% = B, 70-79% = C, 60-69% = D, below 59% = F

Missed Lecture Exam Policy: If you miss an exam for any reason, that exam will receive a score of 0 and will be the exam that is dropped from the final grade calculation. If you miss a second or subsequent exam, you must provide acceptable documented evidence from an appropriate authority (doctor, police, judge, etc.) that circumstances beyond your control prevented you from taking the exam, or that you were required to participate in official UCF business. A doctor's note must be on letterhead with a contact phone number, and must indicate that a medical condition was treated. Documented evidence must be presented to me within 24 hours of the start of the exam. Under these circumstances, a make-up exam will be given following the final exam or at a mutually convenient time to be arranged. In the absence of acceptable documentation, a grade of 0 will be assigned for a 2nd or subsequent missed exam.

Missed Laboratory Exam Policy: Because of their format, there is NO opportunity for a make-up laboratory exam, so be sure not to miss Lab Exam 1 or Lab Exam 2. Your absence will result in your earning a grade of 0 for the missed exam.

Taking Exams: All electronic devices must be inaccessible during exams. Use or display of any unauthorized electronic device will result in a zero for the exam, referral to the Office of Student Conduct, and a "Z Designation" on the student's official transcript (see below). All exams will use scantrons that will be provided to each student. It is your responsibility to bubble in the scantron answers completely with a #2 pencil and erase clearly. If you arrive late to an exam, you will be allowed to take the exam. However, you must turn in the exam paper at the regular scheduled end of the exam. You will not be allowed extra time unless a documentable emergency has occurred (see above).

Cheating will not be tolerated! Turn baseball caps backward while taking exams. Go to the restroom before the exam. Any student caught using unauthorized materials, including electronic devices, in an exam, copying off another paper, signing in for someone else on an exam, or in any way misrepresenting their work will receive an automatic F and the matter will immediately be referred to the UCF Office of Student Conduct for disciplinary action. In addition, a "Z Designation" will be placed on the student's official transcript indicating academic dishonesty, where the letter Z will precede the final grade for this course. For more information about the Z Designation, see <http://z.ucf.edu/>.

Reviewing Exams: Scantrons will not be returned to students. Individual test report sheets with all correct and incorrect responses marked on it will, however, be available. Scores will be posted on the Grades page at our Webcourses site. Exam papers and scantrons can be reviewed in my office, during regularly scheduled office hours, for the period of time up until the next exam (e.g., exam 1 can be reviewed up until exam 2 is administered).

Disability Access: The University of Central Florida is committed to providing reasonable accommodations for all persons with disabilities. Students with disabilities who need accommodations in this course must contact the instructor at the beginning of the semester to request and discuss needed accommodations. Students who need accommodations must be registered with Student Disability Services, Ferrell Commons 7F, Room 185, phone (407) 823-2371, TTY/TDD only phone (407) 823-2116, <http://sds.sdes.ucf.edu/> before requesting accommodations from the instructor.

Important Academic Dates:

Aug 18	Classes begin
Aug 21	Drop/Swap deadline
Aug 22	Add deadline
Oct 27	Withdrawal deadline
Dec 1	Classes end
Dec 3 - 9	Final Exam Period
Dec 5	ZOO 4603C Final Exam 7:00 - 9:50 am (Exam Day 3)
Dec 12 - 13	Commencement
Dec 16	Grades Available on my UCF

Holidays:

Sept 1	Labor Day (Mon)
Nov 11	Veteran's Day (Tues)
Nov 27	Thanksgiving Day (Thurs)

Schedule of Lecture Topics

Textbook Chapter
Developmental Biology Gilbert 10th ed.

Developmental Anatomy and Specification	1
Gametes & Fertilization	4
Early Development in Invertebrates	5, 7
Exam 1 - Sept 19	
Early Development in Amphibians	8
Early Development in Birds and Mammals	9
Ectodermal Derivatives	10, 11
Exam 2 - Oct 22	
Mesodermal & Endodermal Derivatives	12, 13
Sex Determination & Germ line Differentiation	15, 17
Postembryonic Development	16
Early Development & Axis Specification in <i>Drosophila</i>	6
Exam 3 - Nov 21	
Final Exam - Dec 5	Comprehensive

Laboratory Schedule

Dates	Topics	Lab Manual References (pages) Wright's Atlas of Developmental Biology
Aug 20	<u>Lab 0</u> . Introduction and distribution of slides	Handout
Aug 27 & 29	<u>Lab 1</u> . Frog cleavage, gastrulation, & neurulation	77-80, 95-96, 109-115
Sept 3 & 5	<u>Lab 2</u> . 4 mm frog	143-150
Sept 10 & 12	<u>Lab 3</u> . 7 mm frog	156-161
Sept 17 & 19	<u>Lab 4</u> . 10 mm frog	162-169
Sept 24 (Wed)	Review for Lab Exam 1	
Sept 26 (Fri)	Lab Exam 1 (frog embryology)	
Oct 1 & 3	<u>Lab 5</u> . <i>Experimental</i> : Sea urchin fertilization	Handout
	<u>Lab 6</u> . <i>Experimental</i> : Live 11 mm frog embryos	Handout
Oct 8 & 10	<u>Lab 7</u> . Chick cleavage, gastrulation, & neurulation	80-83, 96-101, 116-123
Oct 15 & 17	<u>Lab 8</u> . 33-hr chick	171-191
Oct 22 & 24	<u>Lab 9</u> . 48-hr chick	194-199
Oct 29 & 31	<u>Lab 10</u> . <i>Experimental</i> : Set up planarian regeneration	Handout
	<u>Lab 11</u> . <i>Experimental</i> : Live chick embryos	Handout
Nov 5 & 7	<u>Lab 12</u> . 72-hr chick	201-209
Nov 12 (Wed)	Review for Lab Exam 2	
Nov 14 (Fri)	Lab Exam 2 (chick embryology)	
Nov 19	Finish planarian regeneration & checkout slides	

Studying for the Lab Exams

Attendance is mandatory for the 4 Experimental Laboratories. Each unjustified absence from these labs will result in a 2% reduction of your final cumulative score. With the exception of the 4 *Experimental Laboratories*, lab attendance is optional. On regular weeks, the Wednesday 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 (using individual microscopes) or in small groups (using microscopes equipped with flatscreen monitors). The time spent in lab is entirely up to the student's discretion. However, be mindful of the fact that your lab exam grades will correlate with time spent in lab. Many students in the past have performed well on the lecture exams but have missed out on earning an A for their final grade because they did not put enough effort into 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 are two-dimensional sections. Do not attempt to merely memorize the structures within individual sections. Instead, learn to identify the position of each structure within the three-dimensional embryo, recognize its origin, and track how each structure (and the entire embryo) changes over time.

Supplementary Materials for the Laboratory

You will be provided with a complete set of microscope slides with multiple sections of prepared embryos 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 slide box only after placing it on your bench with the lid on top; otherwise the slides may fall out and break. If you damage a slide you may be required to replace an entire set (\$50 and up). Always carry the microscope 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 negligence. Notify the instructor immediately if you find any damaged slides or supplies.

i>clicker Instructions

Required i>clicker: We will be using the i>clicker classroom response system on a daily basis. You will need to purchase an i>clicker remote and bring it with you to every class lecture. It would be wise to bring extra batteries as well, as we will be using the remotes in activities that count for class points. The purchase of a remote is NOT optional; it will be used as an integral part of this course.

You have the option of using the original **i>clicker** remote, the newer **i>clicker+** (ISBN: 1464120153), or the alphanumeric-capable **i>clicker2** remote (ISBN: 1429280476). You may purchase a remote at the UCF Bookstore or online <http://iclicker.com/purchase/>. Instructions are on the back of the remote.

IMPORTANT INFORMATION BEFORE PURCHASING YOUR i>CLICKER:

- **Be sure to consider which of your other courses may require an i>clicker or i>clicker2 remote.** I will only ask Multiple Choice questions in class. However, you may need an i>clicker2 remote for answering numeric/alphanumeric questions in another course.

INSTRUCTIONS FOR i>CLICKER COURSE REGISTRATION: i>clicker is a response system that allows you to respond to questions I pose during class, and you will be graded on that feedback and/or your in-class participation. In order to receive this credit, you will need to register your i>clicker remote by Wednesday, **AUGUST 27, 2014**. You must have come to class at least once and voted on at least one question in order to complete this registration.

Log into your **Webcourses** account. Choose our course and click on the i>clicker link. Follow the instructions to type in your clicker ID (directly under the barcode on the back of your remote). i>clicker will be used every day in class, and you are responsible for bringing your remote daily.

i>CLICKER POLICIES:

Cheating policy:

I consider bringing a fellow student's i>clicker remote to class to be cheating and a violation of UCF's *The Golden Rule* of Conduct. If you are found with a remote other than your own or have votes in a class that you did not attend, you will forfeit all clicker points and face additional disciplinary action.

Forgotten clicker policy:

Note that we will be using i>clicker in almost every class and clicker points will make up 10% of your final grade. Please remember that it is your responsibility to come prepared to participate with a functioning remote every day. However, I do realize that difficult circumstances do arise, and for this reason I will drop the single lowest i>clicker day from your total participation grade.

Broken/lost clicker policy:

If you have lost or broken your i>clicker remote, you will have to purchase another one. Please email me with your new remote ID so that I can manually register your new remote.

i>clicker Refunds and Exchanges: Unopened i>clicker remotes can be returned to the UCF Bookstore for a full refund during the first week of classes with a receipt.

Note that the instructor reserves the right to make changes to the syllabus or other aspects of the course at anytime. These changes will be announced in class.