

BIOLOGY 3480
VERTEBRATE EMBRYOLOGY

4 CREDIT HOURS
SPRING 2017

Lecture Section 01 | 9:00 – 9:50 am | MWF | LDB 136 CRN 22765

Lab Section 02 | Monday | 2:00-4:50 pm | LDB 136 | CRN 22768

Lecture Course Instructor:

Anna Blice-Baum, Ph.D.

Department of Biological Sciences

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Office Hours: Tuesday and Thursday, 10:00 – 11:00 AM, Wednesday 10:00 AM – 12:00 PM, or by appointment. Please e-mail me if you will be coming to my office hours or to make an appointment.

Course Description:

Vertebrate embryology is the investigation of the processes by which animals develop. Much of what we know today about the process of animal development was gleaned through studies on model organisms, such as *Drosophila melanogaster* (fruit fly) and chickens. Studies on these model organisms and others characterized key morphological and signaling events that occur during development. Information you learn in this course is relevant to medical fields, such as stem cell biology, cancer, metabolic disorders, and more.

Prerequisites:

A grade of “C” or better in BIOL 1411 (Botany), BIOL 1413 (Zoology), and BIOL 2440 (Cell biology).

Required Course Materials:

Developmental Biology by Scott F. Gilbert and Michael J. F. Barresi. (11th Edition, 2016) Sinauer Associates, Inc.

An online laboratory manual is included with the text book.

A notebook for recording materials, methods, and observations

Primary journal articles relating to lecture material will be assigned once a week for the purposes of group presentations and classroom discussions.

Lecture:

Most lecture material will come from the textbook listed above as well as relevant material from the literature. Concepts will be emphasized and/or clarified through the use of animations and live cell recordings. Problem sets are available at the conclusion of each chapter to further emphasize key concepts. These are beneficial but not required.

Every Friday is Journal Club. We will discuss a primary literature article. Groups of two students will present figures and conclusions to the class, and we will discuss the paper as a class. All students besides the two presenting the paper will be responsible for answering a set of questions about the paper assigned. The schedule of presenters will be posted on BlackBoard once enrollment is finalized. Papers and questions will be posted at least a week before they are discussed.

Course Objectives:

- Students will gain a firm understanding of the morphological events that occur during development of multicellular organisms.
- Students will better understand molecular signaling processes and pathways involved in regulating developmental events.
- Students will gain a better appreciation for and ability to analyze primary literature on the subject of development.

Attendance Policy:

Regular and punctual attendance is EXPECTED for lecture. Regular and punctual attendance is MANDATORY for laboratory sessions. There will be no make-up lab sessions.

Exams:

Midterm: The midterm will consist of three questions per student. There will be a question bank of ~25 questions, and each student will be assigned three questions to answer in the form of an essay with at least 5 primary literature sources for each question. The midterm will be assigned 2 weeks before it is due, and it must be submitted through turnitin.com. Detailed instructions will be posted on BlackBoard further into the semester.

Final: The final exam will be similar to the midterm and will be a take-home essay exam. It will be due at the end of the scheduled final exam time for this class **Wednesday, May 10 at 11:30 AM.**

Performance Evaluation:

Midterm Exam		100 pts
Final Exam		100 pts
Laboratory performance		100 pts
Questions on articles	5 pts each	50 pts
Paper presentations		50 pts
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Total		400 pts

Lab grade:

Your lab grade will be determined by the following criteria:

Attendance and participation in lab procedures		25 pts
Pre-lab questions		10 pts
Lab reports	4 x 10 pts	40 pts
Final lab presentation		25 pts
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Total		100 pts

Pre-lab questions:

Aside from the first week of lab, all pre-lab exercises are due at the beginning of the lab period for each lab module.

Lab reports:

You will have 4 lab reports to submit in the form of a journal article. Each lab report will be due **one week** after we complete an entire lab module. Components of the lab report include:

- Abstract (Usually easiest to write after all other parts are complete)
- Introduction
- Materials and methods
- Results
- Discussion/Conclusions
- Literature cited

Lab #1: Ch. 5 from the lab manual: Gametogenesis

Lab #2: Ch. 4 from lab manual: Cellular Slime Molds

Lab #3: Ch. 8 from lab manual: Fruit Fly Lab

Lab #4: *Ex ovo* chick incubation “Chick-in-a-cup” (Lab and pre-labs will be made available on BlackBoard)

Lab safety:

You must wear appropriate attire at all times in the laboratory, even if it is just for lecture and not lab. You may not bring any food or beverage into the classroom at any time. You may not wear open-toed shoes during lab time.

Make-up exams:

Because the midterm and final exam are both take-home and must be submitted through turnitin.com, late work will not be accepted. Any special circumstances will be considered at the time, and any late work in that case will result in half a letter grade deduction in score per day late (5 points per day).

All assignment and exam scores will be posted on BlackBoard as soon as the scores are available. Students may check progress in the course at any time through the BlackBoard website.

Academic Integrity:

The University expects students to engage in all academic pursuits in a manner that is above reproach. Students are expected to maintain complete honesty and integrity in the academic experiences both in and out of the classroom. Any student found guilty of dishonesty in any phase of academic work will be subject to disciplinary action. The University and its official representatives may initiate disciplinary proceedings against a student accused of any form of academic dishonesty including, but not limited to, cheating on an examination or other submitted academic work, plagiarism, collusion, and the abuse of resource materials. Students should refer to policy 810213 in the student section of the Academic Policy Manual for examples of academic dishonesty.

If the instructor determines that a student has been academically dishonest, the instructor may impose a grade of “F” for the assignment/examination or impose a grade of “F” for the course. If the student involved does not accept the decision of the instructor, the student may appeal the decision to the Chair of the Department of Biological Sciences. If the student does not accept the decision of the Department Chair, the student may appeal the decision to the Dean of the School of Arts and Sciences.

Classroom Conduct:

Students will refrain from behavior in the classroom that intentionally or unintentionally disrupts the learning process and, thus, impedes the mission of the University. Cell phones must be silenced or turned off before the start of class. Text-messaging is not permitted during class. Talking while the instructor is lecturing is not permitted and is rude. Students who are disruptive will be asked to leave class and may be reported to the Dean of Students for disciplinary action in accordance with University policy. Because this class is being taught in a laboratory setting, food and drink must be left outside of room 136 during class and lab.

Student Absences of Religious Holy Days Policy:

Section 51.911(b) of the Texas Education Code requires that an institution of higher education excuse a student from attending classes or other required activities, including examinations, for the observance of a religious holy day, including travel for that purpose. Section 51.911 (a) (2) defines a religious holy day as: “a holy day observed by a religion whose places of worship are exempt from property taxation under Section 11.20....” A student whose absence is excused under this subsection may not be penalized for that absence and shall be allowed to take an examination or complete an assignment from which the student is excused within a reasonable time after the absence.

University policy 861001 provides the procedures to be followed by the student and instructor. A student desiring to absent himself/herself from a scheduled class in order to observe (a) religious holy day(s) shall present to each instructor involved a written statement concerning the religious holy day(s). The instructor will complete a form notifying the student of a reasonable timeframe in which the missed assignments and/or examinations are to be completed. For a complete listing of the university policy, see:

http://www.shsu.edu/~vaf_www/aps/documents/861001.pdf

Students with Disabilities Policy:

It is the policy of Sam Houston State University that individuals otherwise qualified shall not be excluded, solely by reason of their disability, from participation in any academic program of the university. Further, they shall not be denied the benefits of these programs nor shall they be subjected to discrimination. Students with disabilities that might affect their academic performance should register with the Office of Services for Students with Disabilities located in the Lee Drain Annex (telephone 936-294-3512, TDD 936-294-3786, and e-mail disability@shsu.edu). They should then make arrangements with their individual instructors so that appropriate strategies can be considered and helpful procedures can be developed to ensure that participation and achievement opportunities are not impaired.

SHSU adheres to all applicable federal, state, and local laws, regulations, and guidelines with respect to providing reasonable accommodations for students with disabilities. If you have a disability that may affect adversely your work in this class, then I encourage you to register with the SHSU Services for Students with Disabilities and to talk with me about how I can best help you. All disclosures of disabilities will be kept strictly confidential. NOTE: No accommodation can be made until you register with the Services for Students with Disabilities. For a complete listing of the university policy, see:

<http://www.shsu.edu/dept/academic-affairs/documents/aps/students/811006.pdf>

<http://www.shsu.edu/syllabus/>

Visitors in the Classroom:

Only registered students may attend class. Exceptions can be made on a case-by-case basis by the professor. In all cases, visitors must not present a disruption to the class by their attendance. Please inform me prior to a visitor in the classroom due to space restrictions. Students wishing to audit a class must apply to do so through the Registrar's Office.

Tentative Schedule

Week	Date	Topic	Reading	Lab
1	1/18 1/20	Introduction to this class BIOL 3480 Chapter 1: Making new bodies	Pg 1 – 28	No lab
2	1/23 1/25 1/27	Chapter 1 continued Chapter 2: Specifying identity First paper discussion – Dr. BB How to read a primary research article	Pg 29 – 44	Chapters 1-3 of lab manual
3	1/30 2/1 2/3	Chapter 3: Differential gene expression Paper 1: student group presentation	Pg 45 – 94	Ch. 5 Gametogenesis Pre-lab due
4	2/6 2/8 2/10	Chapter 3 continued Chapter 4: Cell-cell communication Paper 2: student group presentation	Pg 95 – 142	Ch. 5 Gametogenesis
5	2/13 2/15 2/17	No lecture (Dr. BB at conference) No lecture Paper 3: student group presentation		No lab <u>Lab 1 report due</u> 11:59 pm
6	2/20 2/22 2/24	Chapter 4 continued Paper 4: student group presentation Midterm assigned		Ch. 4 Cellular Slime Molds Pre-lab due
7	2/27 3/1 3/3	Chapter 6: Gametogenesis Chapter 7: Fertilization Paper 5: student group presentation	Pg 202 – 213 Pg 217 – 250	Ch. 4 Cellular Slime Molds
8	3/6 3/8 3/10	Chapter 7 continued Paper 6: student group presentation Midterm due at 11:59 pm		Ch. 4 Cellular Slime Molds
	3/13	Spring Break No class		
9	3/20 3/22 3/23 3/24	Chapter 9: <i>Drosophila</i> Dr. Blythe Shepard seminar presentation: LDB 214, 4 – 5 pm Paper 7: student group presentation	Pg 277 – 309	<u>Lab 2 report due</u> Ch. 8 <i>Drosophila</i> Pre-lab due
10	3/27 3/29 3/31	Chapter 12: Birds and Mammals Paper 8: student group presentation	Pg 379 – 411	Ch. 8 <i>Drosophila</i> lab
11	4/3 4/5 4/7	Chapter 13: Neural tube formation and patterning Paper 9: student group presentation	Pg 413 – 437	Ch. 8 <i>Drosophila</i> lab
12	4/10 4/12 4/14	Chapter 14: Brain growth No class	Pg 439 – 462	<u>Lab 3 report due</u> Chick-in-a-cup Pre-lab due

13	4/17 4/19 4/21	Chapter 17: Paraxial mesoderm Paper 10: student group presentation	Pg 539 – 580	Chick-in-a-cup lab
14	4/24 4/26 4/28	Chapter 17 continued Chapter 24: Development in Health and Disease Paper 11: student group presentation	Pg 735 – 761	Chick-in-a-cup lab
15	5/1 5/3 5/5	Chapter 24 continued Chapter 23: Aging and Senescence Paper 12: student group presentation	Pg 723 – 734	<u>Lab 4 report due</u> Work on presentations
16	Finals Week	<i>Final Exam</i> <i>Wednesday, May 10; 9:30 – 11:30 AM</i> <i>Lab: May 10; 5:00 – 7:00 PM</i>		Lab presentations

Syllabus Agreement

Once you have read the syllabus, please fill this page out, separate it from the rest of the syllabus, and return it to me at the beginning of the second class period (**January 20, 2016, 9:00 am**).

NAME:

WHAT WAS THE BEST PART OF YOUR WINTER BREAK?

WHAT ARE YOU MOST INTERESTED IN LEARNING ABOUT THIS SEMESTER IN VERTEBRATE EMBRYOLOGY?

HOW WOULD YOU LIKE THIS CLASS TO BE DIFFERENT THAN OTHER BIOLOGY CLASSES YOU HAVE TAKEN IN THE PAST (e.g., more relevance to your life, increased awareness of the literature, no multiple choice exams, etc.)?

I have read and understand the class syllabus and agree to fulfill all my responsibilities as a student. I agree that any materials I generate for this class can be used by SHSU for purposes related to education and assessment.

Sign: _____ Date: _____