

Fayetteville State University
College of Arts and Sciences
Department of Natural Sciences
ZOOL 430-Animal Development
Spring, 2012

I. Locator Information:

Instructor: Dr. Valeria P. Fleming
Course # and Name: ZOOL 430 – Animal Development Office Location: LSA 326
Semester Credit Hours: 3 Office hours: T 11:45-1:45, W 4-4:50, R 11-1:30 (others
hrs by appointment)
Day and Time Class Meets: M W 10:00-11:50 Office Phone: (910) 672-1688
Total Contact Hours for Class: 240
Email address: vflaming@uncfsu.edu

FSU Policy on Electronic Mail: Fayetteville State University provides to each student, free of charge, an electronic mail account that is easily accessible via the Internet. The university has established email as the primary mode of communicating with enrolled students about impending deadlines, upcoming events, and other information important to student progression at the university. Students are responsible for reading their email on a regular basis to remain aware of important information disseminated by the university. The university maintains open-use computer laboratories throughout the campus that can be used to access electronic mail.

Students making inquiries via email to FSU faculty and staff about academic records, grades, bills, financial aid, and other matters of a confidential nature are required to use their FSU email account.

Rules and regulations governing the use of FSU email may be found at:

<http://www.uncfsu.edu/PDFs/EmailPolicyFinal.pdf>

II. Course Description: A study of principles of animal development including cellular and tissue assembly, embryogenesis, and reconstitutive development, with two (2) hours of laboratory studies of the development of representative vertebrate embryos. *Prerequisite: ZOOL 370.*

III. Disabled Student Services: In accordance with Section 504 of the 1973 Rehabilitation Act and the Americans with Disabilities Act (ACA) of 1990, if you have a disability or think you have a disability please contact the Center for Personal Development in the Spaulding Building, Room 155 (1st Floor); 910-672-1203.

IV. Textbooks:

Gilbert, Scott F, *DEVELOPMENTAL BIOLOGY*, 9th ed., Sinauer Associates, Inc. 2006

Tyler, Mary S. & Ronald N. Kozlowski, *VADE MECUM: AN INTERACTIVE GUIDE TO DEVELOPMENTAL BIOLOGY (Internet Access – see textbook or CD-ROM –Version 2.2, 2006)*

Wright, Shirley J. *A PHOTOGRAPHIC ATLAS OF DEVELOPMENT BIOLOGY*, Morton Publishing Co., 2005. (*Highly Recommended*)

V. Student Learning Outcomes:

Upon successful completion of this course, students will be able to:

1. Relate contributions made to embryology and developmental biology from at least 12 classical or outstanding experiments and by 10 outstanding scientists, as assessed on quizzes and tests.
2. Explain at least 12 fundamental concepts in development, evaluated by performance on tests and exams.
3. Explain the process by which a germ cell becomes a mature, properly organized, functional gamete, and demonstrate knowledge on quizzes, tests and exams.
4. Describe fully the fertilization process, its physiological and structural results, with assessment through tests and special assignments.
5. Differentiate between the types of cleavage common to vertebrate and selected invertebrate embryos with assessment through laboratory and lecture tests.
6. Discuss contemporary theories of the molecular basis for information storage and utilization in early development. This will be evaluated through Selected Reading Reports and tests.
7. Explain how the prospective definitive areas of selected representative vertebrate and other representative embryos originate, become identified and become structurally and chemically oriented toward their ultimate destination. Evaluation will be done through tests, exams, or class presentations.

8. Relate the sequence of activities that are responsible for the development of the functional organs of the adult vertebrate body from the primary organ rudiments. Assessment to be made by lecture tests and exams.
9. Trace and explain the complete development of the systems of vertebrate embryos when given visual presentations of representative stages. Evaluated by lab tests and lab reports and lecture tests.
10. Identify representative organ primordial and developmental stages in sea urchin and drosophila embryos and in larval forms of the 24, 33, and 72 hr chick embryos. Evaluated by lab tests performance.
11. Recall and interpret the basic vocabulary of animal development. Assessment will be determined using all evaluations in the course.
12. Exhibit knowledge of the major problems involved in development, control and maintenance of cytodifferentiation in animals. Evaluations made via tests, quizzes, class presentations, and reading reports.
13. Identify and discuss at least five developmental processes that occur after embryonic development has been completed. Success evaluated by tests and quizzes.
14. Read typical developmental biology research articles with understanding, as evidenced in Reading Reports and Web assignment presentations.
15. Communicate knowledge of development through well organized, correctly spelled, and correctly structured written presentation of question responses and reading reports. Assessment will be made in all evaluation instruments.

VI.Course Requirements and Evaluation Criteria

Final grades will be derived from a composite number of points earned during the course for the following activities:

300 Pts	= Three lecture tests valued at 100 pts. each
150 Pts	= Selected reading reports, internet assignments, and other special assignments
150 Pts	= Lab reports
200 Pts	= Lab tests
150 Pts	= Quizzes, lab questions puzzles, bonus points, other miscellaneous assignments
<u>200 Pts</u>	= Final examination
1150Pts	= TOTAL

Vocabulary/concept identification quizzes, or assignment quizzes may be given, unannounced, at the instructor's discretion.

Total earned points and their grade equivalencies will be as follows:

980 and above	= A
880 – 979	= B
750 – 879	= C
600 - 749	= D

.Please note: If these evaluation criteria must be revised because of extraordinary circumstances, the instructor will distribute an amendment to the syllabus.

Students are expected to take all test/examinations on the scheduled dates. **Excused absences from test will be very rare and make-up tests/examinations will be discouraged. A make-up test/examination will only be given once for the semester.** There will be **NO MAKE-UP LAB EXAMS.**

Selected Reading Reports

Reading reports should be two to four pages in length (must be word processed or typed) and must include succinct summaries of the publication using the following format:

Title, author, journal, journal date, pages

- I.** *Problem/Question*
- II.** *Experimental procedure(s)/Methods*
- III.** *Experimental Results*
- IV.** *Conclusions/Summary*
- V.** *Special Comments/Discussion (yours)*

A reading report is due in January and in February. (See course schedule). **READING REPORTS WILL NOT BE ACCEPTED LATER THAN 7 CALENDER DAYS AFTER THE DUE DATE UNLESS THE INSTRUCTOR HAS GIVEN PRIOR APPROVAL.** Points will be deducted for each calendar day a report is late. Two written web assignments and one special lab assignment will be due as specified on the course schedule. The regulations for submission of web assignments and special lab assignment are the same as those cited for the Reading Reports. **THE LAST REPORT WILL NOT BE ACCEPTED AFTER THE DUE DATE.**

Lab Reports and Lab Questions

Lab questions for each laboratory exercise **must be completed prior to each lab and submitted at the beginning of each lab period. Lab questions will not be accepted after the lab period.**

Lab reports should be prepared according to the format specified in the laboratory manual. Lab reports are **DUE ONE WEEK AFTER COMPLETION OF THE LAB. REPORTS TURNED IN MORE THAN ONE WEEK LATE WILL BE DOWNGRADED ONE POINT PER CALENDAR DAY.** (Example: A lab report due on Sept 26 that is turned in on Oct 10 will loose 7 penalty points from the potential earned, i.e. 33 (potential grade) – 7 (penalty pts) = 26 pts maximum potential grade).

Student Behavior Expectations:

The instructor will respect all students and will make every effort to maintain a classroom climate that promotes learning for all students. Students must accept their responsibility for maintaining a positive classroom environment by abiding by the following rules:

- 1...Students are expected to attend and be active participants in ALL class lecture and laboratory sessions. Attendance will be taken at each class session. Students missing more that 4 class sessions may have final point score reduced by ten percent (10%).
2. Students are expected to arrive to class on time, remain in class until dismissed by the instructor, and refrain from preparing to leave class until it is dismissed.
3. Students must refrain from any activities that will disrupt the class; this includes use of cell phones and pagers.

Cell phones and pagers must be put in bags or backpacks during tests.

Academic Integrity

Each student must be familiar with the Academic Integrity Policy of the university. In accordance with the policy, cheating, plagiarism, misrepresentation, any other acts of academic dishonesty including submission of work that is the work of another student, will be a violation of the academic integrity policy and will be addressed accordingly. Cheating on tests/exams will result in an automatic zero for that test/exam and an automatic 25% penalty on the next test/exam. Cheating could also result in course failure.

VI. Academic Support Resources

For additional information (e.g. experimental details, historical information, medical implications, commentaries, text updates, links to other sites,) on topics in this course you are referred to the web site URL

<http://www.devbio.com>

AND [http:// zygote.swarthmore.edu/index.html](http://zygote.swarthmore.edu/index.html)

VII. Course Outline and Assignment Schedule (See attached pages)

VIII. Teaching Strategies

This course is designed to provide a general study of major concepts of animal development. It will combine a study of descriptive, experimental and molecular approaches to understanding the developmental processes that occur in the life cycle of vertebrates and selected invertebrates. The descriptive study will rely heavily on the laboratory work where identification of structural changes will be made. The experimental study will be used to guide students toward an understanding of how development is controlled and what factors affect the control mechanisms. The molecular study will emphasize the cellular and biomolecular mechanisms that are basic to development.

Much emphasis will be placed on the use of selected readings from scientific journals, Internet assignments, course related CD-ROMS, and other study aids.

The laboratory activities will focus on the student's ability to recall, identify, and associate the theories and concepts of development and apply them to the study of developmental stages of selected invertebrate and vertebrate embryos. The

laboratory will use simulations, microscope slide studies, live embryonic studies of sea urchins, fruit flies, fish and chick embryos.

IX. Bibliography/References

Selected references from the reference list at the end of each chapter will be recommended. Current issues of the following journals should be review regularly:

American Scientist

Cell

Development

Journal of Experimental Zoology

Science

Developmental Biology

In Vitro Cellular & Developmental Biology

Molecular Biology & Evolution

American zoologist

Cell Differentiation

Journal of Embryology and Experimental

Morphology

Nature

Scientific American

Genes and Development

Journal of Cell Biology

Proceedings of the National Academy of Science

**ZOOL 430 - ANIMAL DEVELOPMENT
LABORATORY SCHEDULE
SPRING, 2012**

<u>DATE</u>	<u>EXERCISE TITLE</u>	<u>Lab #</u>	<u>ATLAS CHPT</u>
Jan 9	Orientation		
Jan 18	Using the Microscope	3	2
Jan 25	Gametogenesis (<i>Report due Feb 1</i>)	5	3, 4
Feb 1	Echinoid Fertilization (<i>Report due Feb 8</i>)	6	5
Feb 8-15	Drosophila Development (<i>Report due Feb 22</i>)	8	6, 7, 8
Feb 15	Fish Development (<i>Report due TBA</i>)	15	6, 7, 8
Feb 22	TEST I		
Feb 29	Early Development of the Chick (<i>Report due Mar 14</i>)	9	11
Mar 3-9	Spring Break		
Mar 14	The 33 Hr Chick	10	11
Mar 21- 28	The 72 Hr Chick	Supplement & Vade Mecum	11, 12 13
Apr 4	Living Chick Embryo	11	
Apr 11	TEST II		

LAB REPORT SCORING

NUMBER OF LAB REPORTS: 4 TOTAL POINTS PER REPORT: 35 pts (except # 8 = 45 pts)

SCORING:

Abstract	4 pts
Introduction	6 pts (Statement of problem = 4; Why = 2)
Materials/Methods	3 pts
Results	10 pts/ 15 pts for # 8
Discussion	10 pts/ 15 pts for # 8
Literature cited	<u>2 pts</u>
	35 pts

