

Syllabus for
BIO 431L—Developmental Biology Laboratory
1.0 Credit Hour
Fall 2016

I. COURSE DESCRIPTION

One 3-hour lab session per week with equal emphasis and time given to the study of prepared microscope slides and experimental manipulation of living, developing sea urchins, planaria, cellular slime molds, frogs, chickens and zebra fish.

Corequisite: BIO 431 Lecture

Lab fee: \$100.

II. COURSE GOALS

The purpose of this course is to enable the student to do the following:

- A. Develop a fascination and excitement involved in the study of developing organisms.
- B. Gain a keen awareness of and a respect for living organisms.
- C. Learn and understand important developmental processes.
- D. Learn experimental approaches to the study of development.
- E. Think analytically about developmental patterns observed.
- F. Develop meticulous manipulative techniques.

III. STUDENT LEARNING OUTCOMES FOR THIS COURSE

As a result of successfully completing this course, the student will be able to do the following:

- A. Think analytically about developmental patterns observed and manipulated.
- B. Express the functional concept of major developmental principles.
- C. Contrast and compare the developmental sequence of comparative structures in sea urchins, amphibians, birds, and mammals.
- D. Devise experimental procedures for testing hypotheses of developmental patterns.
- E. Discuss the potential regenerative power in different organisms.

IV. TEXTBOOKS AND OTHER LEARNING RESOURCES

Required Textbook

Tyler, MS and Kozlowski, RN. 2015. Developmental Biology: A Guide for Experimental Study. Sinauer Press. 3rd edition.

Packaged with an interactive guide and lab manual: <http://labs.devbio.com/protected/index.html>

Optional Textbooks

Sadler, TW. 2015. Langman's Medical Embryology. 13th edition. Wolters Kluwer Press.

Schoenwolf, GC. 2007. Atlas of Descriptive Embryology. 7th edition. Pearson-Benjamin Cummings.

Wright, S.J. 2005. A Photographic Atlas of Developmental Biology. Morton Publishing, Englewood, CO. ISBN: 9780895826299

V. POLICIES AND PROCEDURES

A. University Policies and Procedures

1. Attendance at each class or laboratory is mandatory at Oral Roberts University. Excessive absences can reduce a student's grade or deny credit for the course.
2. Students taking a late exam because of an unauthorized absence are charged a late exam fee.
3. Students and faculty at Oral Roberts University must adhere to all laws addressing the ethical use of others' materials, whether it is in the form of print, electronic, video, multimedia, or computer software. Plagiarism and other forms of cheating involve both lying and stealing and are violations of ORU's Honor Code: "I will not cheat or plagiarize; I will do my own academic work and will not inappropriately collaborate with other students on assignments." Plagiarism is usually defined as copying someone else's ideas, words, or sentence structure and submitting them as one's own. Other forms of academic dishonesty include (but are not limited to) the following:
 - a. Submitting another's work as one's own or colluding with someone else and submitting that work as though it were his or hers;
 - b. Failing to meet group assignment or project requirements while claiming to have done so;
 - c. Failing to cite sources used in a paper;
 - d. Creating results for experiments, observations, interviews, or projects that were not done;
 - e. Receiving or giving unauthorized help on assignments.By submitting an assignment in any form, the student gives permission for the assignment to be checked for plagiarism, either by submitting the work for electronic verification or by other means. Penalties for any of the above infractions may result in disciplinary action including failing the assignment or failing the course or expulsion from the University, as determined by department and University guidelines.
4. Final exams cannot be given before their scheduled times. Students need to check the final exam schedule before planning return flights or other events at the end of the semester.
5. Students are to be in compliance with University, school, and departmental policies regarding the Whole Person Assessment requirements. Students should consult the Whole Person Assessment handbooks for requirements regarding general education and the students' majors.

- a. The penalty for not submitting electronically or for incorrectly submitting an artifact is a zero for that assignment.
- b. By submitting an assignment, the student gives permission for the assignment to be assessed electronically.

B. Course Policies and Procedures

1. Evaluation Procedures

The students are required to have a working knowledge and an understanding of the material studied in **BIO 431 lecture and BIO 431 laboratory** and this will be evaluated by keeping a detailed laboratory notebook, lab reports, quizzes, and lab practicals. Due to the corequisite nature of the laboratory material, students are held responsible for the material in laboratory as the lecture.

<u>Source</u>	<u>Points</u>
3 lab quizzes	75
2 practicals	200
3 lab reports**	300
lab notebook	<u>125</u>
total	700

2. All exercises require individualized effort in conducting the experiments, analyzing and interpreting the data. Plagiarism and falsifying data are two temptations to be avoided concerning these exercises. **Any evidence of plagiarism or cheating on lab work will automatically earn an F grade for the semester.**
3. It is expected that all work be handed in on time. **Late assignments will be penalized 10% per day for each day later, including weekends.** If absent, any missed quizzes or work must be made up within one week.
4. Whole Person Assessment Requirements
None

VI. COURSE CALENDAR

<u>Lab exercise topic</u>	<u>Tyler lab</u>	<u>Date</u>
Orientation, introduction, syllabus	1,2,3	13-Aug
Gametogenesis	5	20-Aug
Sea Urchin fertilization & early dev** (Quiz 1-gametogenesis)	6	27-Aug
Sea Urchin UV damage**	7	3-Sep
Cellular slime molds	4	10-Sep
Planaria regeneration**	13	17-Sep
Planaria regeneration**	13	24-Sep
Amphibian development	14	1-Oct
Lab practical I		8-Oct
Fall Break	Fall Break	15-Oct

<u>Lab exercise topic</u>	<u>Tyler lab</u>	<u>Date</u>
Chick development**	9,10,11	22-Oct
Chick development**	9,10,11	29-Oct
Chick development**	9,10,11	5-Nov
(Quiz 3--early chick development)		
Zebra fish development	15	12-Nov
Mammalian development	Atlases	19-Nov
Thanksgiving	Thanksgiving	26-Nov
<i>Lab practical II</i>		3-Dec
**= required formal lab reports		

Course Inventory for ORU's Student Learning Outcomes

Developmental Biology Laboratory – BIO 431L Fall 2016

This course contributes to the ORU student learning outcomes as indicated below:

Significant Contribution – Addresses the outcome directly and includes targeted assessment.

Moderate Contribution – Addresses the outcome directly or indirectly and includes some assessment.

Minimal Contribution – Addresses the outcome indirectly and includes little or no assessment.

No Contribution – Does not address the outcome.

The Student Learning Glossary at <http://ir.oru.edu/doc/glossary.pdf> defines each outcome and each of the proficiencies/capacities.

OUTCOMES & Proficiencies/Capacities		Significant Contribution	Moderate Contribution	Minimal Contribution	No Contribution
1	Outcome #1 – Spiritually Alive Proficiencies/Capacities				
1A	Biblical knowledge				X
1B	Sensitivity to the Holy Spirit				X
1C	Evangelistic capability				X
1D	Ethical behavior		X		
2	Outcome #2 – Intellectually Alert Proficiencies/Capacities				
2A	Critical thinking	X			
2B	Information literacy	X			
2C	Global & historical perspectives		X		
2D	Aesthetic appreciation			X	
2E	Intellectual creativity	X			
3	Outcome #3 – Physically Disciplined Proficiencies/Capacities				
3A	Healthy lifestyle				X
3B	Physically disciplined lifestyle				X
4	Outcome #4 – Socially Adept Proficiencies/Capacities				
4A	Communication skills		X		
4B	Interpersonal skills		X		
4C	Appreciation of cultural & linguistic differences				X
4D	Responsible citizenship	X			
4E	Leadership capacity		X		