

Comparative Vertebrate Anatomy
The University of Toledo
College of Natural Sciences and Mathematics
BIOL 3510 – 001(53408)

Instructor: Guofa Liu, Ph.D.
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Office Hours: TR, 9:45-11:30AM
or by appointment
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Class Location: BO 1005
Class Day/Time: TR, 1-1:50PM
Lab Location: WO 1214
Lab Day/Time: TR, 2-3:40 PM
Credit Hours: 4 credit hours
Term: Fall 2015
Teaching Assistant: Paul Williams

Course/Catalog Description:

A comparative treatment of the evolutionary and developmental history of the major vertebrate organ systems.

Course Overview:

BIOL 3510, a laboratory based course, is designed to introduce the comparative vertebrate morphology and give you an opportunity to focus on anatomy and its significance. Because vertebrate morphology is an integrative discipline, it will bring together physiology, embryology, behavior, and ecology as well as modern methods of systematics and new finds in paleontology. The discipline of vertebrate biology is diverse and inclusive, covering basic themes from molecular biology, evolution, embryology, biomechanics and experimental physiology. This course will include Origin of Chordates, The Vertebrate Story, Biological Design, Life History, Integument, and Skeletal System: the Axial Skeleton, the Appendicular Skeleton and the Skull, The Muscular System, The Digestive Systems, The Circulatory System, The Respiratory System, The Urogenital System, The Endocrine System, The Nervous System and The Sense Organs. Customarily, this course will prepare you headed into professional fields such as human medicine, dentistry, veterinary medicine, or scientific research.

Prerequisites and Corequisites:

None

Required Texts and Ancillary Materials:

I. Required TEXTS and Lab Manual:

- A. Kenneth V. Kardong (K/K), *Vertebrates Comparative Anatomy, Function, Evolution*, 6th ed.

- B. Kenneth V. Kardong and Edward J. Zalisko (K/E), *Comparative Vertebrate Anatomy: A Laboratory Dissection Guide*.

II. Selected Readings:

- A. George C Kent & Robert K. Carr, *Comparative Anatomy of the Vertebrates*, 9th ed.
B. Karel F. Liem, William E. Bemis, Warren F. Walker, Jr., Lance Grande, *Functional Anatomy of the Vertebrates, An Evolutionary Perspective*, 3rd ed.
C. Alan Feduccia & Edward McCrady, *Torrey's Morphogenesis of the Vertebrates*, 5th ed.
D. Dale W. Fishbeck & Aurora Sebastiani, *Comparative Anatomy: A Vertebrate Dissection Guide*.

Lecture handouts will be posted on the course Blackboard site prior to the lecture. Protective goggles are not required, but it is advisable to wear a lab coat during the lab sessions.

Expectations:

Preparation- Proper preparation prior to each lecture and lab section is essential for the success of this course. You should read over the referred to pages in the text and the laboratory manual material before coming to lab. The lecture text is helpful in your understanding of the laboratory material and provides useful diagrams or pictures. Knowing what to do before you get to the laboratory bench will maximize your time and help you better understand the structures. The teaching assistants are present to help you with any problems you may encounter during the lab session, but they are not there to tell you what to do at each step of the experiment.

Participation- All students are required to not only attend all of the lectures, but actively participate in each lab session. The exercises in an anatomy laboratory are fairly straightforward: find and identify particular structures, note their relationships to other structures, and remember the location and relationships you have identified. Students also need to understand meaning and significance of these form-and-function relationships. The drawback is the amount of time it often takes to find and clearly identify a structure, especially since you are exploring unknown or unfamiliar territories. You will pick up some tricks along the way to make your quest easier, but there is no secret to what is necessary to do well in an anatomy lab—time, and lots of it! It is quite possible that you will need to spend two or three times the scheduled amount of lab time on your own in order to do well. The lab will be available to you; whether you choose to take advantage of this extra time is up to you. If you are having difficulty understanding the lecture or lab material, see me or Mr. Arnold to get things straightened out.

University Policies:

Policy Statement on Non-Discrimination on the basis of Disability (ADA):

The University is an equal opportunity educational institution. Please read The University's Policy Statement on Nondiscrimination on the Basis of Disability Americans with Disability Act Compliance.

Academic Accommodations:

The University of Toledo is committed to providing equal access to education for all students. If you have a documented disability or you believe you have a disability and would like information regarding academic accommodations/adjustments in this course please contact the Student Disability Services Office.

Dates of Importance:

September 24	Lecture Test 1
October 5-6	Fall Break
October 15	Laboratory Test 1
October 29	Lecture Test 2
November 26-27	Thanksgiving
December 10	Lecture Test 3
December 16	Laboratory Test 2

Course Policy on Absences:

Students are expected to **attend all of the lectures and lab sessions**. In the event of an unanticipated absence due to illness or emergency it is the students' responsibility to provide written documentation in the form of a doctor's letter or equivalent. Whether an excuse for missing a session is acceptable or not will be at the discretion of the instructor. If you must miss an exam because of an illness or other legitimate reasons, you need to contact me before the exam. If an emergency makes this impossible, you must inform me within 24 hours after the exam. In any case, be prepared with official documentation of the reason that forced you to miss the exam and we will work things out. Without proper notification and documentation, you will receive a zero on the exam.

Student Evaluation (Grading):

There will be a total of 100 points available. The breakdown is as follows:

Lecture Test 1	15
Lecture Test 2	15
Laboratory Test 1	20
Laboratory Test 2	25
Lecture Test 3 (Final Exam)	20
Attendance/Participation	5

Final grades will be decided on your total points earned in each test and assigned as below.

Grading Scale

Grade	% Correct		Grade	% Correct
A	90-100		C	70-67
A-	87-89		C-	66-63
B+	83-86		D+	62-59
B	79-82		D	58-55
B-	75-78		D-	54-51
C+	71-74		F	50-0

Course Policy on Cheating:

Although you will be working with a partner during the lab session, it is your individual responsibility to prepare for each lab as if you were performing the experiment on your own. Cheating on exams will not be tolerated. Students caught cheating will be given a zero for that test, may be given an F for the course, and all information pertaining to the incident will be forwarded to departmental, college, and university disciplinary committees. **Students are responsible for reviewing the University Policy Statement on Academic Dishonesty which is found on <http://www.utoledo.edu/dl/students/dishonesty.html>.** The official Departmental Policy on Academic Dishonesty is attached at the end of the syllabus.

Tentative Lecture Schedule

	<u>Topic</u>	<u>Reading Assignments</u>
A.	Origin of Chordates	K/K, Ch. 1-2
B.	The Vertebrate Story	K/K, Ch. 3
C.	Biological Design	K/K, Ch. 4.
D.	Life History	K/K, Ch. 5
E.	Integument	K/K, Ch. 6
F.	Skeletal System: the Axial Skeleton	K/K, Ch. 8
G.	Skeletal System: the Appendicular Skeleton	K/K, Ch. 9
H.	Skeletal System: the Skull	K/K, Ch. 7
I.	The Muscular System	K/K, Ch. 10
J.	The Digestive Systems	K/K, Ch. 13
K.	The Circulatory System	K/K, Ch. 12
L.	The Respiratory System	K/K, Ch. 11
M.	The Urogenital System	K/K, Ch. 14
N.	The Endocrine System	K/K, Ch. 15
O.	The Nervous System	K/K, Ch. 16
P.	The Sense Organs	K/K, Ch. 17

Laboratory Schedule

Lab Assistant: Mr. John Arnold
WO 1214

<u>Date</u>	<u>Topic</u>	<u>Reference</u>
T 8/25	Introduction and Survey of Protochordates	K/E, Ch. 1-2; K/K, ch. 1-2
R 8/27	Survey of Protochordates	K/E, Ch. 2; K/K, ch. 2-5.
T 9/1	Agnathans---Examination of a Primitive Vertebrate: The Lamprey	K/E, Ch. 3 ; K/K, ch. 2-5
R 9/3	Agnathans---Examination of a Primitive Vertebrate: The Lamprey	K/E, Ch. 3; K/K, ch. 2-5
T 9/8	The Vertebrate Integuments	K/E, Ch. 4; K/K, ch. 6
R 9/10	The Skeletal Systems: Axial Skeleton	K/E, Ch. 5; K/K, ch. 8.
T 9/15	The Skeletal Systems: Appendicular Skeleton	K/E, Ch. 5; K/K, ch. 9.
R 9/17	The Skeletal Systems: Cranial Skeleton	K/E, Ch. 5; K/K, ch. 7.
T 9/22	The Skeletal Systems: Cranial Skeleton	K/E, Ch. 5; K/K, ch. 7.
R 9/24	Review and Lecture Test 1 (Covered 8/25 -- 9/22)	
T 9/29	Muscular Systems and External Anatomy (1)	K/E, Ch. 6; K/K, ch. 10.
R 10/1	Muscular Systems and External Anatomy (2)	K/E, Ch. 6; F/C, ch. 10
T 10/6	Fall Break	
R 10/8	Muscular Systems and External Anatomy (3)	K/E, Ch. 6; F/C, ch. 10
T 10/13	Muscular Systems and External Anatomy (4)	K/E, Ch. 6; F/C, ch. 10
R 10/15	LABORATORY TEST 1 (MATERIAL COVERED 8/25 -- 10/13)	
T 10/20	Digestive System (1)	K/E, Ch. 7; K/K, ch. 13
R 10/22	Digestive System (2)	K/E, Ch. 7; K/K, ch. 13
T 10/27	Digestive System (3)	K/E, Ch. 7; K/K, ch. 13
R 10/29	Review and Lecture Test 2 (Covered 9/29 -- 10/27)	
T 11/3	Circulatory and Respiratory Systems (1)	K/E, Ch. 8; K/K, ch. 11-12
R 11/5	Circulatory and Respiratory Systems (2)	K/E, Ch. 8; K/K, ch. 11-12
T 11/10	Circulatory and Respiratory Systems (3)	K/E, Ch. 8; K/K, ch. 11-12
R 11/12	Urogenital System (1)	K/E, Ch. 9; K/K, ch. 14
T 11/17	Urogenital System (2)	K/E, Ch. 9; K/K, ch. 14.
R 11/19	Urogenital System (3)	K/E, Ch. 9; K/K, ch. 14

T 11/24	Nervous System (1)	K/E, Ch. 10; K/K, ch.16.
R 11/26	Thanksgiving	
T 12/1	Nervous System (2)	K/E, Ch. 10; K/K, ch. 16.
R 12/3	Nervous System (3)	K/E, Ch. 10; K/K, ch. 16.
T 12/8	Review	
R 12/10	Lecture Test 3 (Covered 11/3-- 12/3)	
W 12/16	LABORATORY TEST 2 (MATERIAL COVERED 10/20 – 12/3)	

Laboratory Notes

1. There will be OPEN LABORATORIES every day except Wednesday from 9:00AM to 4:00PM if possible.
2. The listed topics are only a tentative schedule. Although some materials may not be available on days other than those listed, most will be and you may proceed at a faster or slower pace than suggested. However, you must be thorough, complete, and ready to take the laboratory tests on the specified dates. Finally, rather than rushing ahead to the next section, you are strongly advised to use all extra time to review recently studied material.
3. Immediately report any damaged material to your TA. You will not be charged or punished, but we must replace it if the damage is severe.

STATEMENT OF ACADEMIC DISHONESTY

Department of Biological Sciences

Academic dishonesty by students enrolled in undergraduate and graduate courses and programs offered by the Department of Biological Sciences will not be tolerated. Academic dishonesty includes but is not limited to:

1. Obtaining assistance from another individual during an examination.
2. Giving assistance to another individual during an examination.
3. The unauthorized use of study material or textbooks during an examination.
4. Changing answers on an examination after it has been returned and then submitting it for regrading.
5. Plagiarizing written assignments. Plagiarizing includes but is not limited to: a) Copying laboratory reports from previous years, b) copying or paraphrasing reports, term papers, or these prepared by other students, c) unauthorized collaboration in the preparation of reports, term papers, or theses, and d) use of another author's materials without appropriate acknowledgement through quotation and citation.
6. Attempting to bribe or otherwise induce an instructor to alter either a grade or examination score.
7. Obtaining or attempting to obtain a copy of an examination prior to its administration.

In accordance with policies presented in The Student Handbook and The University Catalog, Instructors have the responsibility and right to report cases of alleged dishonesty to departmental, college, and university administrative units. Students involved in academic dishonesty may expect to receive a grade of F on specific assignments as well as in the course where the assignment was made. In addition, disciplinary action may be recommended through appropriate college and university disciplinary committees. Please consult your instructor for instructions on the implementation of this policy.