

# BIO3420 - COMPARATIVE VERTEBRATE ANATOMY

FALL 2015

**INSTRUCTOR:** Dr. Monte L. Thies

**OFFICE:** LDB115D

**TELEPHONE:** 294-3746

**email:** bio\_mlt@shsu.edu

**OFFICE HOURS:** 9:00 – 10:30 MF, 9:00-11:00 W, and by appointment or during lab.

**LECTURE:** 8:00 - 8:50 MWF in LDB220

**LABORATORY:** 2:00-4:50 in LDB115

## LECTURE TEXT:

Kardong, K. V. 2011. *Vertebrates: Comparative anatomy, function, evolution*, 6<sup>th</sup> or 7<sup>th</sup> ed., McGraw-Hill, Boston, MA.

## LABORATORY TEXTS:

### Required:

Fishbeck, D. W., and A. Sebastiani. 2015. *Manual of Vertebrate Dissection: Comparative Anatomy*, 3<sup>rd</sup> ed. Morton Publishing Co., Englewood, CO.

### Recommended:

Gilbert, S. G. 1973. *Pictorial Anatomy of the shark*. Univ. Washington Press, Seattle.

\_\_\_\_\_. 1973. *Pictorial Anatomy of the Necturus*. Univ. Washington Press, Seattle.

\_\_\_\_\_. 1968. *Pictorial Anatomy of the Cat*. Univ. Washington Press, Seattle.

De Iuliis, G., and D. Pulerà. 2010. *The Dissection of Vertebrates*, 2<sup>nd</sup> ed., Academic Press.

Wischnitzer, S., and E. Wischnitzer. 2007. *Atlas and dissection guide for comparative anatomy*, 6<sup>th</sup> ed. W. H. Freeman Co., NY.

**EXAMS:** Three 100 point lecture exams and a comprehensive final exam (150 points) will be given during the semester and constitute 60% of your grade. Lecture exams will consist of matching, fill in the blank, short answer, definition, and essay questions. The laboratory will constitute the remaining 40% of the course grade: your lab grade will be based on weekly quizzes, three practical exams, and your dissections. **\*\*Note:** Exam and quiz grades will **not** be curved.

## GRADING SCALE:

<b>A</b>	<b>90 - 100 %</b>	<b>675 - 750 points</b>
<b>B</b>	<b>80 - 89 %</b>	<b>600 - 674 points</b>
<b>C</b>	<b>70 - 79 %</b>	<b>525 - 599 points</b>
<b>D</b>	<b>60 - 69 %</b>	<b>450 - 524 points</b>
<b>F</b>	<b>60 %</b>	<b>&lt;450 points</b>

**CLASS ATTENDANCE:** Regular and punctual class attendance is expected of each student. To do well, you must be an equal and active participant in your education – therefore, it is your responsibility to attend class and lab. Most testing material will be based on class notes, lecture/discussion material, and laboratory exercises and notes: to do well on exams **you must**

**attend lecture, spend sufficient time studying and keeping up with the material, and reading along in the book!** Attendance will be taken regularly (See the University Catalogue for details). Excessive absences (>3) may influence your final grade for the course, especially if you are borderline between grades.

If you are unable to come to class due to illness or unexpected circumstances, it is your responsibility to obtain the class notes. You may contact me in my office if you have specific questions about a lecture; however, I will not repeat lectures for students who have missed class.

### LECTURE SCHEDULE - FALL 2015

WEEK OF	LECTURE TOPIC(S)	CHAPTER (KARDONG)
Aug. 26	Introduction, The Vertebrate Body Plan	1
Aug. 31	Phylogeny and Vertebrate Origins, Biological Design	2, 3, 4
Sept. 9	Vertebrate Embryology	5
Sept. 14	Integument	6
Sept. 21	<b>EXAM 1</b> , Skeletal System – Introduction	7
Sept. 28	Skeletal System – Skull	7
Oct. 5	Skeletal System - Axial Skeleton	8
Oct. 12	Skeletal System - Appendicular Skeleton	9
Oct. 19	<b>EXAM 2</b> , Muscular System	10
Oct. 26	Respiratory System	11
Nov. 2	Circulatory System	12
Nov. 11	Digestive System	13
Nov. 16	<b>EXAM 3</b> , Urogenital System - Reproduction	14
Nov. 23	Urogenital System – Reproduction, Thanksgiving Break	14
Nov. 30	Nervous System and Endocrine, Catch up	15, 16
<b>Dec. 7</b>	<b>FINAL EXAM - MONDAY 8:00 - 10:00 A.M.</b>	

The Classification of Vertebrates must be learned as given in class. You will be responsible for this material on ANY exam - lecture or lab!!!!

Suggested Dictionary: *Dictionary of word roots and combining forms* by D. J. Borror.

Outlines of class notes and copies of the schedule are on file on my web page as well as on

Blackboard. Use these notes to outline the lectures and fill in areas you may not have covered well in your notes using your text and lab manual. DO NOT simply download the web notes and consider it "Good". You must annotate them and/or write your own - you are responsible for understanding the full reading assignments and understanding what I talk about in both lecture and lab.

**[http://www.shsu.edu/~bio\\_mlt/biol3420.docx](http://www.shsu.edu/~bio_mlt/biol3420.docx)**

## GENERAL CLASS NOTES AND RULES

### I. Studying Strategies

The key to doing well is to KEEP UP WITH THE MATERIAL. Read chapters prior to coming to class and review and perhaps rewrite your notes following each class. Bring your textbook and laboratory manual, a notebook, and a writing tool to all classes, as well as a tape recorder if you would like to record class lectures. Also bring your lab manual, dissection equipment, latex gloves (if you want to use gloves), and drawing or writing implements to all labs and be prepared to spend the full three hours each week. Many of the figures in the texts will be used in lecture and you should feel free to make notes in the margins of your textbook and laboratory manual. Additional handouts will be provided periodically in lecture and lab. Do not lose or ignore them. If I take the time to make them, they are important and you should study and understand their content.

### II. Academic Honesty

You will find that your performance in this class will benefit from discussion with your classmates and working in small groups on the laboratory dissections. I encourage you to work with others to help clarify concepts and understand the class material. However, on tests and laboratory practicals, you must supply the answers with your own reasoning and words. Outright copying and paraphrasing are not unlike parasitic traits, will not be tolerated by the host, and will result in a 0 for both the host and parasite on the assignment.

### III. Student Absences on Religious Holy Days

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. 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). This request must be made in the first fifteen days of the semester in which the absence(s) will occur. 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.

### IV. Disabled Student Policy

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, you are encouraged to register with the SHSU Counseling Center 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 AFTER you register with the Counseling Center.

## **V. Hints for success in Comparative Anatomy**

1. You must take the responsibility to learn the material. Set a goal for yourself, and determine what it takes to reach that goal. To achieve this goal, some students may need to study 10 hours a week, others may require more or fewer hours. If you are not achieving your goal you may want to talk to me, so that together we can help identify the best ways for you to succeed in this course. Do not wait until the Final Exam to start worrying about your grade!
2. If you are a full time student you should consider studying for your courses as your FULL TIME "job". As a full time student you should spend 8 hours of quality time each day on all of your course work (in lectures, studying, writing, etc.). If you take this "job" seriously and plan the hours of your day wisely, you will succeed. Any additional employment and extracurricular activities should not detract from this time.
3. Study without distractions. It is difficult for most students to study in a noisy dorm or distracting library. Feel free to use the laboratory to study if necessary; however, the room is used for other classes so plan accordingly. A schedule of open study times will be posted on the assignment board in LDB115.
4. Read the textbook and dissection manual before the material is covered in class.
5. Take ample notes during lectures. Use the class note outlines on file on my web page to augment the lectures and fill in areas you may not have covered well in your notes using your text and lab manual. You cannot get by with simply downloading the note outlines and considering it "Good". You must annotate them and/or write your own to have a complete set of notes you will fully understand. Also realize that, although I don't have time to present or discuss everything in the book, you are responsible for understanding the full reading assignments.
6. After class, look over your notes. If you do not understand a concept covered in the lecture, deal with it immediately. Go back to the text and review the topics covered in class. Learn to use your textbook as a reference source and consult the index or table of contents. There are also many other good texts in the library - use them to your advantage!
7. Keep on top of the material. Do not wait until the week before an exam to learn everything.
8. Participate in active studying. When you study, do not simply read your notes and the book. Active studying may involve outlining the material, drawing diagrams, discussing concepts with classmates, etc.
9. You should begin reviewing (NOT studying the material for the first time) at least a week prior to each exam. The best way to review for exams is to study your class notes.
10. Get adequate sleep the night before each exam. Most students will not reach their goal by pulling "all-nighters" before exams - there is simply too much material to cram!!
11. Take all of the laboratory work seriously! Each laboratory session is scheduled for three hours, and it would be beneficial for you to use all of the scheduled time for your dissections, reviewing the manual, or quizzing each other on the specimens. Be an active participant in the laboratory work, and do not watch passively as your lab partners do the dissecting.
12. Spend sufficient time learning the necessary features on your dissection specimens but also look at other students' specimens. To do well on the lab practicals, you will need to be able to recognize similarities and differences in anatomical features on multiple specimens.

**BIO3420 LABORATORY SCHEDULE - FALL 2015**

**Lab Manuals are REQUIRED texts and MUST accompany you to lab to be of any benefit!**

**Lab Materials:** You will be required to provide your own dissection instruments. A minimal instrument kit includes but is not limited to the following:

Large scissors (5 1/2")

Small scissors (4 1/2") with straight, sharp tips

Large, straight forceps with blunt tips; no hooks at tips

Small, straight forceps (4 1/2"), pointed tips, no hooks at tips

Huber probe

Dissecting needle

Metal scalpel handle (don't buy plastic ones) and extra scalpel blades

Rubber or latex gloves - if you want gloves, you should plan to supply your own.

Dissecting instruments can be purchased in the main Biology office (LDB300) or through medical supply houses. For effective dissection, you must have all of the items mentioned above.

**Grading:** Lab constitutes 40% of your final course grade and will be based on:

7 of 10 weekly quizzes (three lowest grades dropped)	75 points
<u>3 Lab practicals (75 points each)</u>	<u>225 points</u>
Lab Total	300 points

\*\*Lab Quizzes will be given at the beginning of the lab period and cannot be made up.

**Be prepared for a lab quiz at the start of each lab period! Because of the variety of terms used in other lab texts, terminology used on the quizzes and exams MUST match those on the handouts.**

CVA lab offers an opportunity to take the structures and systems presented in lectures and examine them in a practical manner. The evolutionary significance of each structure and system will become, or should become, all too apparent to you as you study them. It is the wise student that applies countless hours of diligent probing and prodding on their organism of study. It is the unwise student who feels that they will be able to "slide by" without spending a considerable amount of time doing such things. As will become obvious to you, the weekly quizzes will strive to ensure that you master all of the material as it is presented to you, not just the "significant points".

The provided handouts are your comprehensive guide to all of the structures that you will be responsible for throughout the semester - do not lose them! Replacement copies may be printed from the course documents list on Blackboard. You will be responsible only for the previous week's material on your weekly quizzes unless otherwise informed by your particular lab assistant; however, all material introduced between practicals is cumulative.

The lab grade you receive constitutes 40% of your overall course grade. The grading for the lab is comprised of 8 weekly quizzes that represent 25% of the lab grade. There will be as many as three drop grades on the weekly quizzes for that off time that you have a bad week (try not to use it too early in the semester). The other 75% of your grade is from three comprehensive lab practical exams that are given throughout the semester. There is no drop grade on any practicals.

Nor, due to the time and difficulty involved in setting up a fair practical, are there make-up exams. So again, it is the wise student indeed . . . . Your attitude, cleaning habits, and quality of dissections also have a bearing on your grade, so let's all work neatly and diligently and have a good semester.

### **LABORATORY NOTES AND RULES**

1. You must attend only the lab section for which you are enrolled. The laboratory will already be quite cozy with 24 people per section. Students are not permitted to study in lab while another class is meeting.
2. Students are expected to bring their dissection materials and lab notebooks for every class period. There are no pieces of classroom equipment that can be lent out.
3. Know the location of the safety equipment in the lab.
4. The lab specimens are SHSU property. If loss or damage occurs, students may be held responsible for replacement of the specimens. Dissection specimens may be taken home overnight to study but must be returned by 6:00 pm the evening before a practical. All students in a study/dissection group must approve of or agree to a particular student's taking a specimen home. Due to the cost of specimens, additional dissection material cannot be provided for study.
5. Take good care of your specimens! You will use the same specimens for the entire semester as we move from system to system. If they become desiccated or damaged, they will be of little use to you as you attempt to compare structures. It will also be difficult for us to prepare a fair practical with well-represented or undamaged structures.
6. Students must clean their own dissecting tray, lab table, and the surrounding floor area after each lab. If necessary, students may be assigned duties (e.g., cleaning sinks) on a rotating basis and grades may suffer if cleanup must be done by myself or the TA.
7. Animal parts may be disposed of in the regular trash but need to be bagged appropriately. There is also a "sharps" container for disposal of scalpel blades and razor blades. Do not put paper or animal wastes in this container!
8. You are expected to make the most of the scheduled lab time. Students leaving early will be assumed to have mastered the entirety of the material presented that day.
9. The laboratory will be available for self-study after hours. Hours will be posted during the first two weeks of class. If the privilege is abused (messy lab, missing or destroyed specimens), the privilege will be revoked. Also, when working after hours at night, it is a good idea to work in groups. This is to insure your personal safety when on campus at night.
10. Lecture exam dates may vary, but the lab test dates and material to be covered are written in stone. There will be no exception so don't even ask.....

**BIO3420 LAB SCHEDULE – Fall 2015**

<b>Week</b>	<b>Topics</b>	<b>Pages:</b>
Aug. 26	Introduction: Survey of Vertebrates, External anatomy	Handouts as provided
Sept. 2	Quiz Cephalochordates ( <i>Amphioxus</i> ), primitive vertebrates (Lamprey: <i>Petromyzon</i> /Ammocoete)	Handouts as provided
Sept. 9	Quiz Cranial skeleton I	Handouts as provided
Sept. 16	Quiz Cranial skeleton II	Handouts as provided
Sept. 23	Quiz Trunk and appendicular skeleton	Handouts as provided
<b>PRACTICAL I: 7:30 - 9:00 am Wednesday Sept. 30 in LDB115</b>		
Sept. 30	NO QUIZ Cranial and trunk musculature, Pectoral musculature	Handouts as provided
Oct. 7	Quiz Pelvic musculature	Handouts as provided
Oct. 14	Quiz Respiratory and digestive systems	Handouts as provided
Oct. 21	Quiz Urogenital systems	Handouts as provided
<b>PRACTICAL II: 7:30 - 9:00 am Wednesday Oct. 28 in LDB115</b>		
Oct. 28	NO QUIZ Circulatory systems - thoracic and cranial vessels	Handouts as provided
Nov. 4	Quiz Circulatory systems - abdominal and appendicular vessels	Handouts as provided
Nov. 13	Quiz Nervous system – sheep brain	Handouts as provided
Nov. 18	Quiz Nerves and Sense Organs	Handouts as provided
Nov. 25	THANKSGIVING HOLIDAY (NO LAB)	
<b>PRACTICAL III: Wednesday Dec. 2 during regularly scheduled lab period in LDB115</b>		

**GOOD LUCK and STUDY HARD!!**