

## Syllabus ~ BIOL 212 Comparative Vertebrate Anatomy and Lab (Spring 2010)

### Course Information ~ BIOL 212 Comparative Vertebrate Anatomy and Lab

*Lecture-Discussion:* Mon., Wed., and Fri. at 9:00-9:50 a.m. in AH 122.

*Laboratory:* Tuesday at 2:00-5:20 p.m. in AH 107.

(Lecture and Lab are co-requisites and must be taken concurrently.)

Comparative Anatomy is a Group II Biology Elective applicable to the biology and biomedical science majors.

A study of the structural and functional evolution of selected organ systems in representative vertebrates. The first part of the course reviews the principals of the comparative method and the phylogenetic (evolutionary) relationships among vertebrates. In the remainder of the course, structures and their organization are interpreted in terms of their embryological development, phylogeny, and functional adaptations.

A cooperative and open atmosphere is characteristic of all class and lab meetings. Lecture and laboratory materials will often overlap, and some use of lab time to introduce or review lecture concepts is expected. The laboratory room will be available for additional study during [posted hours](#). *You will want to take advantage of the opportunity to study in the lab in addition to the required class and lab sessions.* Students are encouraged to study together. The laboratory course will require your active participation in the dissection of vertebrate specimens including shark, amphibian, cat, and selected mammal organs. The lab is a required part of the course.

Prerequisites: BIOL 111 and 112 (Principles of Biology I and II and their labs) and CHEM 113 or higher. BIOL 211 (Vertebrate Embryology and lab) is highly recommended as a prerequisite. Students should not take Comparative Anatomy until they have achieved grades of “C” or better in the prerequisite courses. *Students who have not made at least a “C” in each of the prerequisites should repeat the necessary courses before attempting further course work in Biology.* Students without the prerequisites must have permission of the professor or Department Chair to enroll.

### Professor

Dr. Anna E. Ross, Professor of Biology.

Office: AH 111 Phone: 321-3436 (Please record a message if I'm not in the office.)

e-mail: [aross@cbu.edu](mailto:aross@cbu.edu) <http://www.cbu.edu/~aross>

Office Hours: *Mon., Thurs., and Fri. 2:00-5:30 pm.*

Additional times are available upon request (see posted schedule).

### Required Materials

*Text:* Liem, Karl F., Bemis, Walker, and Grande. 2001. *Functional Anatomy of the Vertebrates: An Evolutionary Perspective*. Third edition. Harcourt College Publishers. ISBN 9780030223693

*Laboratory Manual:* Wischnitzer, Saul. 2007. *Atlas and Dissection Guide for Comparative Anatomy*, 6<sup>th</sup> edition. Freeman. ISBN 9780716769590

*Course Supplement:* Ross, Anna E. 2010. *BIOL 212 Comparative Vertebrate Anatomy Lecture and Laboratory Course Supplement*, 2010 edition. CBU Printing Services. (Approx. \$20.00)

*Disposable gloves* (latex or nitrile examination gloves, not vinyl): Students are required to provide and use gloves for dissection of preserved specimens.

*Required Digital images and other required resources:* \\facstaff\biology

*Optional Reference:* Fishbeck, Dale W. and Aurora Sebastiani. 2008. *Comparative Anatomy: A Vertebrate Dissection Guide* 2<sup>nd</sup> edition.. Morton Publ. Co. ISBN 9780895827487 **or** 1<sup>st</sup> edition 2001. ISBN 0-89582-517-1

Course Web page: [http://www.cbu.edu/~aross/Comp\\_Anat.htm](http://www.cbu.edu/~aross/Comp_Anat.htm)

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### Student Responsibilities

You are responsible for all information presented during lecture and laboratory sessions. Lecture and Laboratory attendance are required. *Laboratory sessions will usually require the entire scheduled period.* You will be responsible for cleaning up before you leave lab. Therefore, do not expect to be out of lab before 5:20 pm. **Attendance at quizzes and exams is required.** *If you miss lecture or lab for any reason, you will need to inform me and you are responsible for making up the missed work on your own time (you must have me verify that you have made up missed lab work before the next lab meeting).* Any absences will lower your grade. You will be withdrawn from the course or receive an "F" for excessive absences.

**Laboratory attendance is required.** In a laboratory course, there is simply no substitute for **being there**. Much of the benefit of the lab course is derived from your active participation during the scheduled lab meetings. You will learn more by working with your classmates doing the lab than can be assessed by any quiz or exam. In fact, your active participation in lab is so important that no quiz or exam scores could possibly be high enough to compensate for missing the actual experience of being present in the laboratory. *Therefore, you must attend all of the labs to pass the course.*

You will need to read the assigned text material and the appropriate lab material before you come to lecture or lab. You will need your textbook and course supplement with you during all lecture meetings and most labs. You will need your lab manual and course supplement for all lab meetings. The lab room (AH 107) will be available during [posted hours](#) so that you can review lab materials and complete lab assignments. ☆ **You will want to spend at least two hours per week working in AH 107 in addition to the scheduled lab sessions.**

- No wireless devices (cell phones, pagers, PDAs or calculators), no programmable calculators, and no devices with ear plugs are allowed during exams, quizzes, labs or classes. Students are encouraged to use laptop computers during class or lab but only for directly course-related tasks.

*The course has been structured to afford you every opportunity to develop your ability to learn, to master the required material, and to demonstrate your success in these endeavors. Students who choose to enroll in this course are seeking rigorous pre-professional preparation. This course will provide the level of preparation you require. Nevertheless, you need not feel intimidated by the demanding career path you have selected. I am here to help you overcome any difficulties you may have with the course material and to help you do your best work.*

### Exams and Grading.

Your grade will be determined by your own achievement. There is no curve.

Grading scale:      90.0-100% = A, 80.0-89.9% = B, 70.0-79.9% = C,  
60.0-69.9% = D, below 60.0% = F.

An honor system is in effect for all exams and quizzes. It is considered a violation of the CBU Code of Conduct to receive or give assistance during an examination or quiz. Graded exams and quizzes will be available for student review.

☆ **In this course, students may not keep exams or quizzes and students may not have copies or notes containing exam or quiz questions.** ☆ **In this course, the possession or use of old or current quizzes, Moodle questions, lecture or lab examination questions or answers is considered a violation of the CBU Code of Conduct.**

*Makeup lecture exams, lab exams, or quizzes will only be available under extraordinary circumstances.* ☆ *If you miss a quiz or exam without prior arrangement or fail to notify me within one hour of the scheduled class time to arrange a specific time for a make up quiz or exam, you will not be eligible for a makeup quiz or exam and you will receive a zero for the missed quiz or exam.*

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### The Lecture Course:

Six lecture exams will be given. Exams are 100 points each (a total of 600 points for the course). Lecture quizzes may be given on short notice, if so, they will increase the 600 point total to the lecture course and no makeups will be available for quizzes missed due to unexcused absence. **All lecture exams are comprehensive.** No exam may be dropped. *Makeup exams will only be available under extraordinary circumstances.*

If you miss an exam you must either have made prior arrangement for a makeup exam or, you must notify me within one hour of the scheduled exam time to request and schedule a makeup exam, otherwise you will not be eligible for a makeup exam and you will receive a zero for the missed exam. Ordinarily, no makeup exams are granted and a student will not be allowed more than one makeup exam or quiz for the course.

Lecture exams will cover the topics indicated on the attached schedule unless specific changes are announced in class. Each exam will cover material from lecture, this supplement, and the text. **It is expected that material studied in laboratory will also be incorporated into your responses on lecture exams.** Exams will consist of specific essay questions, short answer, and objective questions. Exam questions may require well-labeled diagrams and will always require detailed and precise responses employing the specialized terminology introduced in the course.

### The Laboratory Course:

Twelve lab quizzes will be given. Each quiz will count 20 points. Your lowest quiz grade (of quizzes you take) will be dropped. You may not drop a zero quiz score received because of an unexcused absence. Thus, your eleven best lab quizzes will total 220 points of the 420 point total for the lab course. Lab quizzes will consist of practical and short answer questions on the material covered during previous lab sessions. This material may include information from lecture, the course supplement, lab manual, website, and the text.

Lab quizzes will begin 2:00 p.m. on Tuesdays. If you are late without making prior arrangement, you may receive a zero on that week's quiz. **No absences from lab are permitted.** Any lab work missed because of an excused absence must be made up prior to the next week's lab. *A makeup for a lab quiz will only be available under extraordinary circumstances.* You must make prior arrangement or notify me within one hour of the scheduled quiz time to be eligible for a makeup quiz.

The Lab Midterm Exam and the Lab Final Exam will each count 100 points. Lab exams will be practical exams covering structural details and their functions. *It may be impossible to make up a missed lab exam.* You will also be evaluated on your cooperation and efforts in lab and on the results of your dissections. Pairs or teams of students will work together to prepare specimens.

*Makeup lab exams or quizzes will only be available under extraordinary circumstances.*

☆ *If you miss a quiz or lab exam without prior arrangement or fail to notify me within one hour of the scheduled lab time to arrange a specific time for a make up quiz or exam, you will not be eligible for a makeup quiz or exam and you will receive a zero for the missed quiz or exam. Note the following requirements regarding make up work:*

- *If you request a makeup quiz and if you are given permission to take a make up quiz, you must take the make up quiz before the next scheduled lab meeting.*

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- Ordinarily you will be required to complete the missed lab work before you are considered eligible for a make up quiz and before the next lab. You must complete all labs to pass the lab course.
- Ordinarily, a student will be granted no more than one makeup quiz for the course.
- Ordinarily, there will be no makeup for a quiz missed because of unexcused absence or lateness (but you will be required to complete any missed lab work).
- University policy on absences will be enforced for lecture and lab.
- If you need special consideration, please ask.
- No wireless devices (cell phones, pagers, PDAs or calculators), no programmable calculators, and no devices with ear plugs are allowed during exams, lab quizzes, labs or classes. Laptops are permitted in class and lab (but you must be on task).

. Record Your Exam and Quiz Scores (you can check your scores on Moodle)

<u>Lecture Exams</u> (100 points each)	<u>Lab Quizzes (20 points each)</u>	<u>Lab Exams (100 points each)</u>
Lecture Exam 1 _____	Lab Quiz 1 _____	Lab Midterm Exam _____
Lecture Exam 2 _____	Lab Quiz 2 _____	Lab Final Exam _____
Lecture Exam 3 _____	Lab Quiz 3 _____	
Lecture Exam 4 _____	Lab Quiz 4 _____	
Lecture Exam 5 _____	Lab Quiz 5 _____	
Lecture Exam 6 _____	Lab Quiz 6 _____	
	Lab Quiz 7 _____	
	Lab Quiz 8 _____	Lab Grade =
	Lab Quiz 9 _____	<i>Drop lowest Quiz</i>
	Lab Quiz 10 _____	[(Best 11 Quiz scores +
	Lab Quiz 11 _____	Lab Midterm +
	Lab Quiz 12 _____	Lab Final)/420] x 100%.

Lecture Grade =  
(Exam 1+2+3+4+5+6)/6.

<u>2010</u> <u>Date</u>	<u>Lecture Schedule</u> <u>Lecture Topic</u>	<u>Laboratory Schedule</u> <u>Tues. Lab Topic</u>
Jan 11 M	Comparative Anatomy Ch. 1	Jan 12 T <i>Lab #1</i> Protochordates and
13 W	Evolution and Phylogenies Ch 1-2	Chordates: Anatomy,
15 F	Origin of Vertebrates Ch. 2	Phylogeny, & Taxonomy
Jan 18 M	<i>Holiday</i>	Jan 19 T <i>Lab #2</i> Lamprey: Larva and
20 W	Agnatha Ch. 3	Adult; Fish Phylogeny
22 F	Placoderms; Chondrichthyes Ch. 3	• <i>Lab QUIZ 1</i>
Jan 25 M	Chondrichthyes Ch. 3	Jan 26 T <i>Lab #3a</i> Fish Phylogeny &
27 W	Chondrichthyes Ch. 3	Skin, Scales (part 1)
29 F	Osteichthyes Ch 3	• <i>Lab QUIZ 2</i>
Feb 1 M	<b>LECTURE EXAM 1, 100 pts.</b> (Ch. 1, 2, 3 through Chondrichthyes)	Feb 2 T <i>Lab #3b</i> Fish Phylogeny &
3 W	Amphibia; Reptilia Ch. 3	Skin, Scales (continued)
5 F	Reptilia Ch. 3	• ( <i>Lab QUIZ 3 is next week</i> )

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2010	Lecture Schedule	Laboratory Schedule
Date	Lecture Topic	Tues. Lab Topic
Feb 8 M	Reptilia; Aves Ch. 3	Feb 9 T <i>Lab #4</i> Skeleton (Shark & Amphibian) • <i>Lab QUIZ 3</i>
10 W	Mammalia Ch. 3	
12 F	<b>LECTURE EXAM 2, 100 pts.</b> (Cumulative, emphasis on Ch. 3)	
Feb 15 M	Integument Ch. 6	Feb 16 T <i>Lab #5</i> Skeleton (Cat) • <i>Lab QUIZ 4</i>
17 W	Head Skeleton Ch. 7	
19 F	Head Skeleton Ch. 7	
Feb 22 M	Head Skeleton Ch. 22	Feb 23 T <i>Lab #6</i> Muscles (Shark and Necturus) • <i>Lab QUIZ 5</i>
24 W	Head and Trunk Skeleton Ch. 7-8	
26 F	Skeleton Ch. 8	
Mar 1 M	<b>LECTURE EXAM 3, 100 pts.</b> (Chs. 6-7, 22)	Mar 2 T <i>Lab #7</i> <b>LAB MIDTERM EXAM, 100 pts.</b> Begin Cat Muscles
3 W	Trunk and Append. Skeleton Ch. 8-9	
5 F	Skeleton Ch. 9	
Mar 8-12	<i>Spring Break</i>	<i>Spring Break</i>
Mar 15 M	Skeleton Ch. 9	Mar 16 T <i>Lab #8</i> Cat Muscles (Homework: Worksheet) • <i>No Lab Quiz</i>
17 W	Muscular System Ch. 10	
19 F	Muscular System Ch. 10	
Mar 22 M	Muscular System Ch. 10	Mar 23 T <i>Lab #9</i> Digestive and Respiratory Systems • <i>Lab QUIZ 6</i>
24 W	<b>LECTURE EXAM 4, 100 pts.</b> (Chs. 8-10)	
26 F	Body Cavity and Mesenteries Ch. 4	
Mar 29 M	Digestive System Ch. 16	Mar 30 T <i>Lab #10</i> Circulatory Systems (Shark, Necturus) • <i>Lab QUIZ 7</i>
31 W	Digestive System Ch. 17	
Apr 2 F	<i>Holiday</i>	
Apr 5 M	<i>Holiday</i>	Apr 6 T <i>Lab #11</i> Circulatory Systems (Cat; Pig Heart; Video) • <i>Lab QUIZ 8</i>
7 W	Digestive System Ch. 17	
9 F	Respiratory System Ch. 18	
Apr 12 M	<i>Respiratory System Ch. 18</i>	Apr 13 T <i>Lab #12</i> Urogenital Sys. (Shark, Necturus, Cat) • <i>Lab QUIZ 9</i>
14 W	Circulatory System Ch. 19	
16 F	<b>LECTURE EXAM 5, 100 pts.</b> (Chs. 4, 16-18)	
Apr 19 M	Circulatory System Ch. 19	Apr 20 T <i>Lab #13</i> Shark Nervous System and Shark Sense Organs • <i>Lab QUIZ 10</i>
21 W	Circulatory System Ch. 19	
23 F	Excretory System Ch. 20	
Apr 26 M	Excretory System Ch. 20	Apr 27 T <i>Lab #14</i> Nervous System (Sheep brain) and Review • <i>Lab QUIZ 11</i> (Shark N.S.)
28 W	Excretory System Ch. 20	
30 F	Reproductive System Ch. 21	
Apr 30 F		<b>Q12 in class, Fri. 30 April</b> • <i>Lab QUIZ 12</i> (Mammal Brain)
May 3 M	Reproductive System Ch. 21	<b>LAB FINAL EXAM (100 points)</b>
May 5-11	(Final Exams) <b>LECTURE EXAM 6, 100 pts.</b> (Chs. 19-21)	

Please note: Exam dates will not be changed unless the majority of the class agrees. Lab exam dates are firm. There may be minor changes in the scheduling of lecture topics.