

# **BIOLOGY 447 (Lecture) and 447S (laboratory) COMPARATIVE VERTEBRATE ANATOMY – 4 credits SPRING 2009**

**INSTRUCTORS:** **Dr. Virginia L. Naples** Lab: Rm. 422; Office Rm. 335 Montgomery Hall;  
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Office Hours: Tuesday and Thursday 1:30 - 3:30; Wednesday 10:00-12:00; other  
times by arrangement.  
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**TEXT:** *Vertebrates: Comparative Anatomy, Function, Evolution*, 5<sup>th</sup> ed. by Kenneth V. Kardong.

**LABORATORY MANUAL:** *Comparative Vertebrate Anatomy: A Laboratory Dissection Guide*, 5th  
edition, Kenneth Kardong and Edward Zalisko

Additional readings will be provided for some lectures and laboratory exercises.

**NOTE 1:** The books listed above are required. You may choose additional supplemental materials, but these will be the basis of reading assignments and dissections. You are expected to bring the books to all lecture and laboratory meetings. You will frequently need to refer to descriptions, figures or plates from the books to complete in-class assignments.

**NOTE 2:** Prior to the start of each class, you should read all pertinent sections in your text, laboratory manual and any handouts provided.

**LECTURES:** Tuesday and Thursday: 11:00 – 12:15, Rm. 221, Montgomery Hall

**LABORATORIES:** Wednesday: 1:00 - 3:50, Rm. 221, Montgomery Hall

The laboratory fee is to be paid in the usual manner.

## **COURSE DESCRIPTION**

Students will be introduced to anatomical terminology and concepts, and the history and evolution of vertebrate groups. In the laboratory, students will observe and dissect a series of vertebrate specimens individually and in groups. Each person is responsible for completing all assignments, whether as part of a group or individually. All students are expected to participate in all aspects of group dissections. Students will also be expected to observe and learn from the dissections of others in the class cooperatively. Viewing all specimens is essential because many systems show sex-related differences, as well as individual variation. Anatomical structure will be dissected using a systemic approach, as will be followed in lecture. In addition to learning about the evolution and structure of vertebrate systems, students are expected to achieve an understanding of the organization and relationships among these systems as well as changes through time.

## **COURSE OBJECTIVES**

At the completion of the course the student should be able to:

1. Identify, define, describe and use anatomical terms appropriately and in context.
2. Describe and identify the essential features of normal vertebrate anatomy at the tissue, organ and

- system level.
3. Explain the anatomical principles involved in the ontogeny and evolution of vertebrate systems and relate evolutionary processes to observed structure and function in vertebrates.
  4. Understand the three-dimensional relationship of body systems.
  5. Know how to locate and evaluate the primary literature on comparative anatomical topics.
  6. Additional specific objectives will be presented for each laboratory and lecture session.

### **COURSE REQUIREMENTS**

The course meets for two 75-minute lectures and one two-hour and fifty minute laboratory periods each week. As understanding of new material is based upon comprehension of previous material, attendance and active participation (the best way to learn) in all lectures and laboratories is expected of all students. This includes each person doing his/her share of all dissections. It is essential that dissections be completed in a timely fashion, and that students learn about system diversity by locating and demonstrating structures for all systems on each species. Cooperative learning and study is encouraged among all students, at all times, except during individual examinations.

### **COMBINED SCHEDULE OF LECTURES AND \*LABORATORIES (\*= *Italicized*)**

<b>DATE</b>	<b>TOPIC</b>	<b>LECTURE READINGS</b> (Text book - Kardong)	<b>LABORATORY TOPIC/READINGS</b> (Laboratory manual Kardong and Zalisko and handouts)
Jan. 13	Introduction; History	Ch. 1	
<b><i>Jan. 14</i></b>	<b><i>Introduction; History, Agnathans, Primitive chordates</i></b>		<b><i>Ch. 1 - 2</i></b>
Jan. 15	Chordate Phylogeny; Vertebrate Phylogeny	Ch. 2-3	
Jan. 20	Vertebrate Phylogeny		
<b><i>Jan. 21</i></b>	<b><i>Integument; skeleton through tissue types</i></b>		<b><i>Ch. 2, p. 20, Ch. 3 p. 37, Ch. 5, p. 94, Ch. 6. p. 120, Ch. 7. p. 151, Ch. 8. p. 234</i></b>
Jan. 22	Vertebrate Phylogeny	Ch. 3	
Jan. 27	Biological Design	Ch. 4	
<b><i>Jan. 28</i></b>	<b><i>Vertebrate skull</i></b>		<b><i>Ch.2 – 8 (parts to be announced prior to class)</i></b>
Jan. 29	Biological Design	Ch. 4	
Feb. 3	Embryology	Ch. 5	
<b><i>Feb. 4</i></b>	<b><i>Skeletal System tissues</i></b>		<b><i>Ch. 2 – 8 (parts to be announced prior to class)</i></b>
Feb. 5	Embryology		
Feb. 10	Skeleton: Skull	Ch. 7	
<b><i>February 11</i></b>	<b><i>LABORATORY EXAMINATION I</i></b>		
<b><i>February 12</i></b>	<b><i>LECTURE EXAMINATION I</i></b>		
Feb. 17	Skeletal System: Axial	Ch. 8	
<b><i>Feb. 18</i></b>	<b><i>Skeletal System: Axial</i></b>		<b><i>Ch. 2 – 8 (parts to be announced prior to class)</i></b>

Feb. 19 Skeletal system: Axial

<b>DATE</b>	<b>TOPIC</b>	<b>LECTURE READINGS</b> (Text book by Kardong)	<b>LABORATORY TOPIC/READINGS</b> Laboratory manual (DeJuliis) and handouts
Feb. 24	Skeletal system: Appendicular	Ch. 9	
<b>Feb. 25</b>	<b><i>Skeletal System: Appendicular</i></b>		<b><i>Ch. 2 – 8 (parts to be announced prior to class)</i></b>
Feb. 26	Skeletal system: Appendicular	Ch. 9	
Mar. 3 <b>Mar. 4</b>	Muscular System <b><i>Muscular System</i></b>	Ch. 10	<b><i>Ch. 2 – 8 (parts to be announced prior to class)</i></b>
Mar. 5	Muscular system	Ch. 10	

**SPRING BREAK – NO CLASSES MARCH 7 – 15**

Mar. 17 <b>Mar. 18</b>	Muscular System <b><i>Muscular System</i></b>	Ch. 10	<b><i>Ch. 2 – 8 (parts to be announced prior to class)</i></b>
Mar. 19	Muscular System	Ch. 10	
<b>March 24</b>	<b>LECTURE EXAMINATION II</b>		
<b>Mar. 25</b>	<b><i>LABORATORY EXAMINATION II</i></b>		
Mar. 26 <b>April 1</b> April 2	Respiratory System <b><i>Respiratory System</i></b> Respiratory System	Ch. 11 <b><i>Ch. 11</i></b>	<b><i>Ch. 2 – 8 (parts to be announced prior to class)</i></b>
April 7 <b>April 8</b> April 9	Circulatory System <b><i>Circulatory System</i></b> Digestive System	Ch. 12 <b><i>Ch. 12</i></b>	<b><i>Ch. 2 – 8 (parts to be announced prior to class)</i></b>
April 14 <b>April 15</b> April 16	Digestive System <b><i>Urogenital System</i></b> Urogenital System	Ch. 13 <b><i>Ch. 14</i></b>	<b><i>Ch. 2 – 8 (parts to be announced prior to class)</i></b>
April 21 <b>April 22</b> April 23	Nervous System <b><i>Nervous System</i></b> Nervous system	Ch. 16 <b><i>Ch. 16</i></b>	<b><i>Ch. 2 – 8 (parts to be announced prior to class)</i></b>
April 28 <b>April 29</b>	Nervous & Sensory systems <b><i>LABORATORY EXAMINATION III</i></b>	Ch. 16 - 17	
April 30 <b>May 5</b>	Nervous & Sensory systems <b>LECTURE EXAMINATION III</b>	Ch. 16 - 17	
<b>May 5</b>	<b>FINAL LECTURE EXAMINATION, Rm. 442, 12:00 – 1:50 P. M.</b>		

All effort will be made to adhere to this lecture syllabus; however, as befitting the interests of the class, some modifications may occur throughout the semester. All students regularly attending classes will be aware of revisions to this schedule. Other aspects of the course schedule may change without notice, resulting from unforeseen circumstances.

## **COURSE GRADING**

<b>LEARNING EVENT</b>	<b>POINT VALUE</b>
LECTURE EXAMINATION I	100
LECTURE EXAMINATION II	100
LECTURE EXAMINATION III	100
FINAL LECTURE EXAMINATION - CUMULATIVE	100
LABORATORY EXAMINATION I	100
LABORATORY EXAMINATION II	100
LABORATORY EXAMINATION III	100
HOMOLOGY POSTER/PRESENTATION	100
GEOLOGIC TIME SCALE	100
ANNOTATED BIBLIOGRAPHY	100
<b>TOTAL POINT VALUE</b>	<b>1000</b>

## **ACADEMIC MISCONDUCT**

Cheating in any form is a violation of the **STUDENT JUDICIAL CODE** of Northern Illinois University and is defined as academic misconduct. Academic misconduct is the receipt or transmission of unauthorized aid on assignments or examination, plagiarism, unauthorized use of examination materials, or other forms of dishonesty in all academic matters. Violations of academic misconduct will be acted upon in accordance with the guidelines outlined in the code. All instances of academic misconduct will be reported to the Office of the Judiciary.

## **COURSE GRADING**

Student performance in Comparative Vertebrate Anatomy (Biology 447) will be evaluated by:

1. Three hour-long lecture examinations, covering one third of the material for the class. These examinations will be a combination of essay, short answer and other non-objective types of questions. Questions on these examinations will emphasize, but will not be restricted to, material covered in lecture as well as in reading and homework assignments. Students will be expected to answer questions in their own words, and will require a body of factual knowledge, ability to analyze and solve functional, biomechanical and evolutionary problems. Spelling, grammar, organization, clarity and conciseness of answers will be counted toward the total grade. Each of these lecture examinations will be worth 100 points. Sample questions from previous years' examinations will be provided for study prior to each lecture examination.

2. The final lecture examination will be cumulative, and will consist of questions of types similar to those of the previous lecture examinations. The total possible points for this final examination will be 100 points. Sample questions from previous years' examinations will be provided for study prior to the final lecture examination.

3. Make-up examinations for both hour examinations and the final examination must be arranged with the instructors on an individual basis and taken within a week of the regularly scheduled time. Any make-up examinations will be similar in format and level of difficulty, but different from the regularly scheduled examinations.

4. Three laboratory practical examinations will be given, consisting of fifty questions each. Students will be expected to identify structures and functions on all specimens, and other laboratory demonstration materials. These examinations will be timed and administered during the regularly scheduled laboratory periods. Each of these examinations will be worth 100 points. Laboratory projects will continue after the laboratory examinations as making use of all of the time available for laboratories is essential.

5. Laboratory make-up examinations will be arranged with the instructors on an individual basis, and will be administered orally. Such examinations will be equivalent to, but may differ in specific content from regularly scheduled laboratory examinations.

6. A final grade of "Incomplete" will only be given in accordance with University regulations. Incompletes must be arranged individually with the instructors of the course.

7. Students are expected to attend all class periods and complete all assignments and examinations as scheduled, unless specific prior arrangements are made. It is the responsibility of the student to ensure that all missed work is completed.

8. If at any time you are either uncertain or concerned about your progress in any aspect of Comparative Vertebrate Anatomy, you are encouraged to speak to your instructors. We will do whatever we can to assist you in being successful in this program.

9. No "extra credit" projects will be permitted.

### **ADDENDUM**

1. Every effort will be made to adhere to the above schedule and procedures. However, they are subject to change in the event of extenuating circumstances.

2. The instructors for this course are always willing to consider suggestions for the improvement of the running and/or organization of the course, and solicit your input.

3. In addition to regular office hours, the instructors will make themselves available on an *ad hoc* basis to review or answer lecture and laboratory questions for extra help. If you need any additional assistance at any time during the course, please ask for it. We are here to help you.