Vertebrate Biology: BZ214  
Spring 2015

Instructor: Dr. Shane Kanatous  
Office: E308 Anatomy/Zoology Building  
Phone: 491-0782  
Email: kanatous@colostate.edu  
Office Hours: 9:30-10:30 Tuesday, Thursday and by appointment.

Teaching Assistants:  
Si Ning Li Email: sl448@cornell.edu  
Ashley Heim Email: ashheim@lamar.colostate.edu  
Ingrid Slette Email: Ingrid.slette@gmail.com

Course Objective: To introduce second year students majoring in zoology or biological science to the evolution of the anatomical, morphological, physiological and ecological characteristics of vertebrate animals.

BZ214 will be a survey of the characteristics that make chordates important, interesting and unique. This class will provide a firm foundation for advanced training in ichthyology, herpetology, ornithology and mammalogy.

This class will be a challenge; to succeed, you will need to assimilate many new facts. You will need to acquire a basic understanding of numerous mechanisms and processes. We strongly suggest you join a study group and make flash cards with the numerous terms and characteristics you will need to know and understand.

Dissection kits, gloves, and old shirt, etc. will be needed for the lab

Meeting times: Lectures will be presented 8:00 to 9:15 (BSB 131) on Tuesday and Thursday.

Grading: Your final grade will be based on your performance on the lecture exams and laboratory practical exams. There will be 4 lectures exams worth 100 points each and a cumulative final worth 200 points. In addition there will be 3 lab quizzes worth 10 points each and 3 lab practical exams worth 40 points each. The total number of points for this course will be 750.

Exams must be taken on the scheduled date. Makeup exams will only be given to students with a University approved absence, which provide documented evidence. Makeup exams will be given at a time of the instructor’s choosing. If you miss an exam for any other legitimate reason, we will average the other two exams to compute your final grade. If you miss more than one exam or the final exam, you will receive an incomplete. If you miss a lecture exam for any unapproved reason, you will receive a score of zero on that exam. If you belong to any University sponsored group, we must be informed of known conflicts with exams with a letter signed by an appropriate authority by the beginning of the second week of classes. Cutoffs for A, B, C, and D grades will be 90, 80, 70, and 60% of the class point total, respectively. We are happy to discuss exam questions with you at any time. However, for scoring purposes, no exam scores will be changed after 7 days following posting of exam scores and keys. We adhere to the Academic Integrity Policy of the Colorado State University General Catalog {Page 7} and the Student Conduct Code.
Please note that attendance at the exams and labs are required. If you do not show up for the first two labs of the semester, you will be dropped from this course.

There will be no extra credit assignments for either the lecture or lab.

There will be random pop quizzes in the lecture that if answered correctly will be worth 1 point. For example: there are 14 weeks in this course so that if you correctly answer all the quizzes 14 points will be added to your final total number of points.

Lecture and Readings: Reading assignments should be completed prior to coming to lecture. Some supplemental reading will be provided on RamCT to provide interesting aspects and real life applications of vertebrate biology.

### Spring 2012

<table>
<thead>
<tr>
<th>Dates</th>
<th>Topic</th>
<th>Reading Assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BZ214 Lecture Outline</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Kanatous</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Reading Assignment</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Introduction to Comparative Anatomy and the Origin of Chordates
- Jan. 20: Intro and Comparative Anatomy as a tool
- Jan. 22: Origin of Chordates/Vertebrates
- Jan. 27: Early vertebrates
- Chapters 1-2

#### The Characteristics of Early Vertebrates
- Jan. 29: Jawless and jawed vertebrates
- Feb. 3: Aquatic life characteristics
- Feb. 5: Aquatic life characteristics
- Chapter 3

#### The Chondrichthyes
- Feb. 10: Sharks, skates and rays
- Chapter 5

#### The Ray-Finned and Lobe-Finned Fishes
- Feb. 12: Bony fish and lobed fin fish
- Feb. 17: Bony fish and lobed fin fish
- Chapter 6

#### Movement to Land
- Feb. 24: How animals evolved to live on land
- Feb. 26: Characteristics for air-breathing
- Chapters 7-8

#### Characteristics of Early Tetrapods, Amphibians, and Turtles (Early Reptiles)
- Mar. 3: Origin of early tetrapods
- Mar. 5: Amniotes/amphibians/Salamanders
- Mar. 10: Reptilian characteristics
- Mar. 12: Ectothermy vs. endothermy
- Mar. 17: Spring Break
- Mar. 19: Spring Break
- Chapters 9-10
- Chapters 9-10
- Chapters 11-12
- Chapters 11-12
<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Chapter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mar. 24</td>
<td>Lepidosaurus and Squamates</td>
<td>13</td>
</tr>
<tr>
<td>Mar. 26</td>
<td>Exam 2</td>
<td></td>
</tr>
<tr>
<td>Mar. 31</td>
<td>Vertebrates and their environment</td>
<td>14</td>
</tr>
<tr>
<td>Apr. 2</td>
<td>Diapsids</td>
<td>16</td>
</tr>
<tr>
<td>Apr. 7</td>
<td>Ornithischian and Saurischian dinosaurs</td>
<td>16</td>
</tr>
<tr>
<td>Apr. 9</td>
<td>Exam 3</td>
<td></td>
</tr>
<tr>
<td>Apr. 14</td>
<td>Early origins of mammals</td>
<td>18</td>
</tr>
<tr>
<td>Apr. 16</td>
<td>Early mammals</td>
<td></td>
</tr>
<tr>
<td>Apr. 21</td>
<td>Common features amongst mammals</td>
<td>20</td>
</tr>
<tr>
<td>Apr. 23</td>
<td>Mammalian diversity</td>
<td>20</td>
</tr>
<tr>
<td>Apr. 28</td>
<td>Mammalian specialization</td>
<td>21</td>
</tr>
<tr>
<td>Apr. 30</td>
<td>Exam 4</td>
<td></td>
</tr>
<tr>
<td>May 5</td>
<td>Diving mammals and birds</td>
<td>suppl. Reading</td>
</tr>
<tr>
<td>May 7</td>
<td>Review</td>
<td></td>
</tr>
</tbody>
</table>

**May 14 Final Exam Thursday 6:20-8:20PM**