

Biol 243 - Comparative Animal Physiology - Fall 2008  
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**Consult the Moodle site for updates to this syllabus.**

**Overview:** This class will explore basic principles of animal physiology using a comparative approach. We will examine the relationship between physiological systems and the physical characteristics of their environments. We will investigate the fundamental principles of physiological systems by observing features that are conserved among a wide diversity of animals. Finally, we will examine the differences between classes of animals in the context of the particular characteristics of each organism's environment.

**Prerequisites:** Prerequisites for this course are Biol 113 and Biol 110 or permission of the instructor.

**Text and reading:** The text for this class is Principles of Animal Physiology by Moyes and Schulte, 2<sup>nd</sup> edition. Required reading is indicated on the schedule below. Textbook reading forms an important part of the material for this course. It is very important that you read the assigned material in the textbook. We will not cover every detail in every chapter during class and material in lectures will extend beyond that covered in the text. However, reading the entire chapter is a key part of the learning process and will help on the exams. Your Biology 113 textbook is a good place for a general review of basic animal physiology. The textbook has excellent review and synthetic questions at the end of each chapter. At least one question on each exam will be taken from these questions either directly or with minor modifications.

Optional text: Christopher Gillen, Reading Primary Literature, 1<sup>st</sup> edition. This short text is a resource for critically reading research articles. It will be especially helpful for the project assignment, especially for students with limited experience reading primary literature articles.

Reserve readings will be assigned some weeks. Please come to class prepared to discuss reserve reading assignments. Short response papers on the reserve reading will be assigned.

**Learning physiology:** Physiology is learned best through practice. Although learning facts about physiology is important, a complete understanding of physiology requires an ability to use those facts. How can you "practice" physiology? Carefully reading the textbook and working on the questions at the end of each chapter is a first step. You must also learn to pose your own questions and work through answers to the questions. Working along with others in small groups can help. You may try crafting questions that fall into the following categories:

- Comparative physiology
- Responses to environmental stress
- Effects of disease, disorder, damage, or gene knock-outs.
- Linkage of structure with function
- Experimental methods and data interpretation.
- Evolution and adaptation

As a starting point, I have compiled exam and homework questions from the past five years and posted them on the Moodle site. These are intended to help you see what kind of questions I ask, not to serve as a content review. The specific content covered in this class varies from year to year.

**Small groups:** We will practice physiology in small groups during class. Small group rules:

- Address group members by name.
- Each group member must participate.

- All group members should be prepared to talk to the class.
- Comments to the class should reflect both personal and group views.
- Each group member is responsible for encouraging the group to follow these rules.

We will also conduct brainstorming sessions. Brainstorming rules:

- The intent of brainstorming is to develop as many ideas as possible.
- Getting the "correct" answer is not the point of a brainstorm.
- There are no wrong ideas in a brainstorm.
- We will not criticize any answer until the brainstorm is over.

During these interactive exercises, the process is much more important than the outcome. The intent of these activities is to model the kind of thinking that you should be learning to do on your own.

**Class attendance and participation:** Class attendance is mandatory. Class participation and attendance will account for 10% of your grade. Additionally, there will be a 3 point reduction in the final average for every 3 unexcused absences (no penalty for less than 3 unexcused absences). To receive an A or and A- in this class, you must participate consistently across the entire semester. To participate intelligently in class, it is imperative that you read the assigned material before each class. Please feel free to ask questions, add insights, request clarifications, etc. at any time during class. Speaking in class will be a primary determinant of class participation, but I realize that there are many different styles and will consider other contributions.

This class begins at 8:10. Please be prepared to begin class at 8:10. This means arriving at about 8:05. Late arrivals will be counted as absences. Excessive unexcused absence or tardiness (more than 6 times during the semester) is grounds for expulsion from the class.

**Project:** See the project instruction sheet on the Moodle site.

**Standards for submitted work:** Work submitted in this class must conform to the following basic standards or it will be returned for revision without a grade.

- Assignments with multiple pages must be stapled.
- Assignments with multiple pages must be paginated.
- Assignments must include a list of references cited in a proper format unless no references were used.
- Assignments must be typed (word-processed).
- Assignments must be proofread for spelling and grammatical errors.

**Exams:** Exams will be composed of short answer, multiple choice, and/or essay questions. You will be allowed to bring into the exam one sheet of 8.5" X 11" paper with notes in your own handwriting (not a computer-generated printout) on one side of the page only. You will hand in the note sheet with the exam. Beware: these note sheets are not a substitute for studying. Many students report that they never consult their note sheets.

Want to see what my exams are like? Many of my exam and weekly assignment questions from the past five years are posted on the Moodle site. At least one question on each exam will be one of the review or synthesis questions from the assigned chapter readings, or a modification of one of these questions.

**Academic honesty:** This class will follow the official Kenyon College position on academic honesty. Consult your Course Catalog for details.

**Audio, video, photos:** No video, photographic, audio, or any other recordings may be made in this class without the express written permission of the course instructor.

**Students with special needs:** Students with disabilities who will be taking this course and may need disability related academic accommodations are encouraged to make an appointment to see me as soon as possible to discuss your learning needs. Also, you are required to register for support services with the Office of Disability Services. Please contact Erin Salva at 5453 or e-mail [salvae@kenyon.edu](mailto:salvae@kenyon.edu).

**Grading:** You are entitled to know how you are doing at any point in the class. Please see me if you want to know your current grade in the class.

Exam 1 = 20%

Exam 2 = 20%

Final exam = 20%

Project = 30%

Attendance, response papers, and participation = 10%

**Extra credit:** Connection papers. If you see a connection between this class and something else in your life (another class, a sports event, something in the news, a seminar that you attend, etc), write a 1 page paper (no more than 1 page, double spaced, 12 pont font) describing the connection. If you are willing to describe the connection in class, please indicate so. You may hand in up to 5 connection papers during the semester, but you may not hand in more than one per week. They will count towards the class attendance and participation grades.

**Deadlines and conflicts:** Work in this class that is handed in late will be penalized 1/3 grade per day. For example, a B+ will become a B. If conflicts exist with scheduled extracurricular events, students must contact me one week before the date to discuss ways to handle the conflict. In the case of exams, it is expected that students will take the exam before the scheduled date. Written assignments should be handed in before the due date if a class is to be missed because of a scheduled event.

**Schedule:** This is a tentative schedule. Additional readings are assigned in many weeks. Reserve readings and updates to this schedule will be posted on the Moodle site.

Aug 28 Intro to Physiology: Chapter 1

Sept 2 and 4 Ion transport: Chapter 2 (focus on 22-35, 64-72); Chapter 10 (481-490).

Sept 9 and 11 Hormones and cell signaling: Chapter 2 (focus on 35-64); Chapter 3  
[Due Sept 11 - Reading assignment 1](#)

Sept 16 and 18 Neurons: Chapter 4  
[Due Sept 18 - Reading assignment 2](#)

Sept 23 Nervous systems: Chapter 7 (306-322)  
Sept 25 Muscle: Chapter 5  
[Due Sept 23 - Project Assignment 1](#)

Sept 30 Muscle Chapter 5  
[Oct 2 Exam 1](#)

Oct 7 Energetics and Metabolism: Chapter 1 (11-12) and Chapter 12 (580-586)  
Oct 9: October Reading Day

Oct 14 and 16 Circulation: Chapter  
[Due Oct 14: Project assignment 2](#)

Oct 21 Circulation: Chapter 8  
Oct 23 Respiration: Chapter 9  
[Due Oct 21 - Reading Assignment 3](#)

Oct 28 and 30 Respiration: Chapter 9  
[Due Oct 28 - Reading Assignment 4](#)

Nov 4 and 6 Digestion: Chapter 11  
[Due Nov 4 - Project assignment 3](#)

[Nov 11 Exam 2](#)

Nov 13 Ion and water balance: Chapter 10

Nov 18 and 20 Ion and water balance: Chapter 10

Thanksgiving Break

Dec 2 Temperature regulation: Chapter 13  
Dec 4 Special Topic: Reading TBA

Dec 9 and 11 Special Topics, Reading TBA  
[Due Dec 9 - Project assignment 4](#)

[Final Exam Dec 19 8:30 a.m.](#)