

BIOL 4446: ANIMAL PHYSIOLOGY

Fall 2011

- Faculty:** Dr. David W. Garton
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- Description:** An introduction to the fundamentals of animal physiology, including basic principles of homeostasis at cellular, tissue and organismal levels. This course includes a survey of basic comparative physiological mechanisms, but focus is primarily on normal functions of vertebrate/mammalian organ systems.
- Textbook:** Randall, David, Warren Burggren and Kathleen French. *Eckart Animal Physiology: Mechanisms and Adaptations*. 5th Edition, W.H. Freeman.
- Lectures:** Attending lecture is **expected**. The lectures and readings are complementary and some material not in the text will be presented only in lecture (and *vice versa*). Lecture exams will be based on topics and material presented in class and in the assigned readings. As a courtesy to your fellow students, **please turn your cell phones, PDAs and laptops off while in lecture.**
- Readings:** Please complete each reading assignment as specified in the syllabus before coming to class.
- Grading:**
- | | |
|-----------------------------|--------------------|
| In-class exams: | 40% (4 @ 10% each) |
| Final exam (comprehensive): | 30% |
| Class assignments: | 30% (3 @ 10% each) |

There will be four ‘midterm exams’ during the semester, each worth 10% of your final grade. Format will include multiple choice, short answer and problem sets, and these exams are designed to help you prepare for the comprehensive final exam worth 30% (**wow**) of your final grade. The other 30% of your final grade will be ‘outside class assignments,’ which will be on varied topics and involve preparing a short, written report based on current literature, accompanied by a single powerpoint slide summarizing your review. Exceptional ppt slides will be selected for in-class presentation (earning bonus points!). The topics and presentation dates are listed in the syllabus (below). Each assignment is due via electronic submission to your T-Square “Drop Box” **one week** in advance of the “special topic” class. As a reminder, these are individual assignments and you are bound by Georgia Tech’s Honor Code not to collaborate nor plagiarize. **Violation of the Honor Code can result in enforced withdrawal from the course with a failing grade.**

Absences: Students are expected to attend class. Missed exams or other assignments can be completed at a later date (‘make-up’) only with an excused absence. Excused absences include medical emergencies (with a signed note from the attending physician or health care provider), family emergencies requiring your presence, or an institute sanctioned event (e.g. athlete participating in a competition). **Make-up of missed exams or assignments will not be permitted for non-excused absences, and a grade of 0 (zero) will be entered for the missed exam or assignment.**

<i>Date</i>	<i>Topics</i>	<i>Chapters</i>
22 Aug	Introduction to Animal Physiology Central Themes & Concepts; Homeostasis	1
24 Aug	Review of Membranes, Osmosis & Ion Transport (Chapter 3 is assigned for review, you are responsible for the material in this chapter, too!)	4 (3)
26 Aug	Ion transport	4
29 Aug	Excitable Membranes: Nernst & Goldman Equations	5
31 Aug	Voltage-gated channels and the properties of action potentials	5
2 Sept	Membrane, action and generator potentials	5
5 Sep	Labor Day, No classes	
7 Sep	AP conduction within and between neurons	6
9 Sep	Neurotransmitters: Production & Recycling	6
12 Sep	Special Topic: Neuropharmacology (class assignment)	-
14 Sep	Intro to sensory systems: transduction	7
16 Sep	Sensory systems	7
19 Sep	Midterm Exam 1	1,3,4,5,6
21 Sep	Sensory systems	7
23 Sep	Sensory systems	7
26 Sep	Sensory systems	7
28 Sep	Overview of the nervous system	8
30 Sept	Nervous system	8
3 Oct	Integration of command & control: neuroendocrine pathways	9
5 Oct	Neuroendocrine pathways	9
7 Oct	Special Topic: Trauma and the Nervous System (class assignment)	
10 Oct	Midterm Exam 2	7,8,9
12 Oct	Intro to Muscle: Structure & Function	10
14 Oct	Muscle Fine Anatomy	10
17 Oct	Fall Break, No classes	
19 Oct	Physiology of Muscle Contraction	10
21 Oct	Integration of Motor Units	10

24 Oct	Adjusting to the Environment: Ionic & Osmoregulation	14
26 Oct	Mammalian Kidney Function	14
28 Oct	Mammalian Kidney Function	14
31 Oct	Non-Mammalian Kidney Function: Weird Ways to Pee	14
2 Nov	Overview of circulatory systems	12
4 Nov	Midterm Exam 3	10,14
7 Nov	Circulation: Physiology of the Heart	12
9 Nov	Circulation: Physiology of the Heart	12
11 Nov	Circulation: Distribution Dynamics	12
14 Nov	Circulation: Exchanges in Capillary Networks	12
16 Nov	Gas Exchange: Environmental Challenges & Solutions	13
18 Nov	Special Topic: Hemodynamics (class assignment)	
21 Nov	Physiology of gases in blood	13
23 Nov	Physiology of gases in blood	13
25 Nov	Thanksgiving Holiday, No classes	
28 Nov	Midterm Exam 4	12,13
30 Nov	Energy: Acquisition and Fate	15
2 Dec	Energy: Acquisition and Fate	15
5 Dec	Energy: Responding to Environmental Changes	17
7 Dec	Energy: Responding to Environmental Changes	17
9 Dec	Course review session, final exam format	

COMPREHENSIVE FINAL EXAM
Wednesday, Dec 14 11:30 am-2:20 pm