

**ANIMAL PHYSIOLOGY**  
**Biology 3703**

Prof. Brooke Vetter                      SSB 152D    [vett0114@d.umn.edu](mailto:vett0114@d.umn.edu)  
Lectures:              MonH 70              Monday and Wednesday: 13:00 - 13:50

Office hours: Tuesdays: 1:00 – 2:30 or by appointment; SSB 152D

Lab T.A.'s: Trevor Keyler ([keyle002@umn.edu](mailto:keyle002@umn.edu)) & Emily Cardinal ([cardi083@umn.edu](mailto:cardi083@umn.edu))

Labs:	SSB 105	Section 1	Vetter	Wed	1400 - 1650
		Section 3	Keyler	Thurs	0900 - 1150
		Section 4	Cardinal	Thurs	1200 - 1450
		Section 5	Cardinal	Thurs	1500 - 1750

Textbook:                      Animal Physiology Third Edition: Hill, Wyse, Anderson. Sinauer Associates Inc.  
ISBN: 978-0-87893-559-8

Lab Manual:                      Animal Physiology Lab Manual 2014 (Required)

Grading

<u>Exercise</u>	<u>Total points</u>
Lecture exams (3)	300
Final exam	200
Lab reports (2)	200
Lab quizzes (5/6)	100
Lab final	125
Lab: Participation, preparation, and cleanup	75
<hr/> TOTAL	<hr/> 1000

A = 900+ ; B =800-899; C =700-799; D =600-669; F = < 600; +/- may be assigned to grades within 10 pts of the cutoff

**Exam 1:** Bats, Muscles, Neurons, Sensory Physiology, Control of Movement

**Exam 2:** Physiology of Breathing, Circulation, and Diving Marine Mammals

**Exam 3:** Ionic and Osmotic Balance and Desert Mammals

**Final Exam:** Cumulative with emphasis on Acquiring and Using Energy and Thermoregulation

Individuals with any disability, either temporary or permanent, which might affect their ability to perform in this class are encouraged to inform the instructor at the start of the semester. Adaptation of methods, materials, and/or testing may be modified as required to provide for equitable participation.

The University of Minnesota is committed to the practice that all of its students shall have equal educational opportunities. The University expressly forbids discrimination on the basis of race, color, gender, sexual orientation, disability, veteran's status, ethnicity, religion, creed, national origin, or marital status. If you believe that your biology instructor has not followed this policy, you are invited to bring this to the attention of the Biology Department Head (207 SSB, 726-7263) or to the Associate Dean of the College of Science and Engineering (140 Engineering, 726-7585). Your conference will be kept confidential.

## **COURSE PHILOSOPHY AND POLICES**

**OBJECTIVE:** To introduce undergraduate students to comparative animal physiology. The lecture portion of the course will examine a diverse array of physiological systems with emphasis on systemic, comparative vertebrate physiology. The laboratory component of the course will consist of “wet labs” where students will have an opportunity to work with “live” physiological preparations. Students will be instructed in basic animal preparation, data collection and analysis and preparation of laboratory reports.

**OFFICE HOURS AND AVAILABILITY:** While I have posted office hours, if these times are not convenient, then please feel free to e-mail me and we can schedule an appointment. I am happy to discuss any topics relevant to the course or answer questions you may have about graduate school and other post-undergrad opportunities.

**CONTACT:** Email is the best method to contact me outside of class. If the email cannot be answered within a reasonable degree of text, I will ask that you make an appointment to discuss the matter. For laboratory questions/situations, please contact your GTA directly.

**LECTURE NOTES:** I am happy to provide copies of the lecture power points for you to access on line. These are designed to enhance the course experience and to aid note taking, not replace it, as they are often incomplete, contain many abbreviations, superimposed figures. Many students spend so much time scribbling notes, that they do not have any chance to comprehend the material. Therefore, so you do not have to write every word, these notes will be available for your benefit. They should not be used in place of attending lecture.

**TEXTBOOK:** The Hill, Wyse, Anderson textbook is very good and the majority of material and figures will come from this book. However, this text’s chapters are very detailed and it would be impossible to cover everything in this course. Therefore, I have pointed out chapters that coincide with the lecture material in the syllabus. Please note: **you are not responsible** for anything I do not mention in lecture. I do suggest reading the recommended chapters and focusing on the figures from the posted lecture notes. Most of the students that do well in this course, read the chapters prior to lecture

**GRADING:** Your grades will be determined based on written lecture exams, written lab reports, lab quizzes and participation, and general participation/preparation/clean up points in correlation with the following scale. Total pts = 1000; Letter grade: A B C D F (Percentage 90%, 80%, 70%, 60%, < 60%)

*Lecture exams/final = 500 Pts*

There will be three lecture exams (100 pts) and a comprehensive final (200 pts). These exams are designed to test your ability to think critically and not just memorize facts. Many students have a difficult transition going from multiple-choice tests to critical thinking essay exams therefore the final is cumulative and more heavily weighted.

*Lab reports = 200 pts*

There will be approximately 10 “wet” labs. Each lab exercise will be recorded in your lab manual. These will include the appropriate data tables, charts and graphs as indicated in each lab handout in addition to any questions you are assigned. Two labs will be designated for you to write as a formal lab report. Each report will be worth 100 pts. The first report must be submitted individually. The second report may be done individually or as a lab group.

*Lab quizzes = 100 pts*

There are six scheduled lab quizzes. You may drop your lowest score. These quizzes will be given the week *following* the exercise. They are designed to reinforce both the lecture and laboratory material and help students prepare for the lab final. At least one question may come from the introductory material to the upcoming lab to ensure students are reading in preparation for lab.

*The lab manual*

We do not grade the lab manual. However all questions/charts/diagrams should be completed in the manual at the end of each lab. You will only be allowed to staple/add material to the manual as instructed by your GTA. You will be allowed to use the manual for the lab final.

*Laboratory attendance/participation, flow charts, preparation and clean up = 75 pts*

The lab procedures are often complicated and involve not only knowledge of the physiological concepts to be tested but also skills operating the computer software and data acquisition system. While we will work on developing these skills during lab, it is imperative that you come to lab prepared. Even prepared students will probably need the majority of the lab period to complete the exercises. Attendance is mandatory and preparedness and cleanup will be the bulk of your lab participation points. If you have any doubt about the condition of your lab bench prior to departure, please ask the instructor. Unexcused missed laboratories and/or late arrivals may result in the forfeiture of all these points.

*Lab final = 125 pts*

This will be a comprehensive exam of the semesters’ lab. As you will be allowed to use your lab manual for assistance, it is suggested that you record appropriate diagrams, figures etc. of the set up to help on the final. The final may be comprised of some or all of the following: multiple choice, short answer and essay questions, identification of laboratory equipment/ setups, data acquisition/analysis, figure analysis/illustrations/ neuroanatomy. It is an active practical, so please make sure to be familiar with running the PowerLab Data Acquisition System and operating the corresponding software, LabChart7. **Please Note:** Your lab final may be scheduled outside your normal lab period to relieve congestion. This may mean starting 30 minutes prior to or after the regularly scheduled time.

**LAB GROUPS:** Due to the cost of equipment, there is not enough equipment for each one of you to have your own station. We will therefore operate in groups of three or four. As most scientific endeavors require multiple personnel, this will provide an excellent introduction to teamwork.

**ATTENDANCE:** You are expected to attend all lectures and laboratories. If you have to miss a lab, you will be expected to make the appropriate arrangements to attend another lab that week. This means notifying the TA in advance and asking permission to attend another lab section. If you more than 2 labs without documented reasons for your absence, you will not receive credit for the course. If you have to miss an exam or quiz, it is best to notify the instructor or TA ahead of time or provide a written excuse.

**ACADEMIC INTEGRITY:** This course will adhere to UMD's Student Academic Integrity Policy, which can be found at [www.d.umn.edu/assl/conduct/integrity](http://www.d.umn.edu/assl/conduct/integrity). This policy sanctions students engaging in academic dishonesty with penalties up to and including expulsion from the university for repeat offenders. The instructor will enforce and students are expected to follow the University's Student Conduct Code (<http://www.d.umn.edu/assl/conduct/code>).

I find this material to be fascinating and we have a great group of TA's! I am really looking forward to a fantastic semester.

# Animal Physiology Fall 2014

## Lecture Schedule:

<b>Week 1</b>	<b>Day</b>	<b>Topic</b>	<b>Textbook</b>
Wednesday	September-3	Physiology as an Integrative Science	
<b>Week 2</b>			
Monday	September-8	Bats	pp. 359, 372-373
Wednesday	September-10	Muscles	Ch. 20
<b>Week 3</b>			
Monday	September-15	Neurons	Ch. 12 & 13
Wednesday	September-17	Neurons	Ch. 12 & 13
<b>Week 4</b>			
Monday	September-22	Sensory Physiology	Ch. 13 & 14
Wednesday	September-24	Sensory Physiology/Control of Movement	Ch. 13 & 14/19
<b>Week 5</b>			
Monday	September-29	Control of Movement	Ch. 19
Wednesday	October-1	<b>Exam 1</b>	
<b>Week 6</b>			
Monday	October-6	Physiology of Breathing	Ch. 22 & 23
Wednesday	October-8	Physiology of Breathing	Ch 23
<b>Week 7</b>			
Monday	October-13	Physiology of Breathing	Ch. 23 & 24
Wednesday	October-15	Circulation	Ch. 24 & 25
<b>Week 8</b>			
Monday	October-20	Circulation	Ch. 25
Wednesday	October-22	Circulation/ Diving Mammals	Ch. 25/26
<b>Week 9</b>			
Monday	October-27	Diving Marine Mammals/Review	Ch. 26
Wednesday	October-29	<b>Exam II</b>	
<b>Week 10</b>			
Monday	November-3	Ionic and Osmotic Balance	Ch 27
Wednesday	November-5	Ionic and Osmotic Balance	Ch 28
<b>Week 11</b>			Ch 28/29
Monday	November-10	Ionic and Osmotic Balance	
Wednesday	November-12	Ionic and Osmotic Balance	Ch 29
<b>Week 12</b>			
Monday	November-17	Ionic and Osmotic Balance	Ch 29/30
Wednesday	November-19	Desert Mammals	Ch 30
<b>Week 13</b>			
Monday	November-24	<b>Exam III</b>	
Wednesday	November-26	Acquiring and Using Energy	Ch 6
<b>Week 14</b>			
Monday	December-1	Acquiring and Using Energy	Ch 7
Wednesday	December-3	Acquiring and Using Energy	Ch 9
<b>Week 15</b>			
Monday	December-8	Thermal Relations	Ch 10
Wednesday	December-10	Mammals in Frigid Places	Ch. 11
<b>Final Exam</b>	December-19	8:00 a.m. – 9:55 a.m. MonH 70	Ch 6, 7, 9-11 & Cumulative