

Biology 340: Animal Physiology

Fall 2010

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Office:	Frazier Jelke 142W	Class:	MWF 9-9:50 am in FJB
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Office Hours: Fridays 9:50-11:20, or by appointment. Feel free to also stop by whenever you like, but if you make an appointment, I'll be sure to be available.

Required Text: *Animal Physiology*, 2nd Ed., by: Hill, Wyse, Anderson. This is an in depth text, and the best that I could find on the subject. It covers new findings that other texts fail to note. Use it as a reference to accompany the class lecture materials. I may also assign specific readings from this text. Otherwise, exams will focus on materials covered in lecture.

Moodle: Information such as this syllabus and laboratory exercises will be posted on Moodle and it is your responsibility to access your Moodle account regularly to check for new materials. I will also set up an anonymous comments section where you can post feedback about the course. Both lecture and lab will be served by the lecture portion of Moodle.

Email: Course announcements will be sent to your Rhodes email accounts, and it is your responsibility to check those email accounts regularly. Email is also the easiest way of reaching me, though please note that I do not check my email as often during the evenings and weekends as during school days.

Special Accommodations: If you need any sort of special accommodations in relation to this course, please bring this fact to my attention by Sept 1st, so that arrangements can be made.

Course Summary: This course is designed to provide students a general but in-depth understanding of various systems of animal physiology (e.g., muscular, nervous, endocrine, cardiac, digestive, respiratory, renal, etc.). An emphasis will be placed on the maintenance of **homeostasis** within these systems. Furthermore, a **comparative approach** will be taken so that you are not only memorizing how the human body functions, but also seeing how various animals have evolved similar physiological endpoints—such an approach will allow you to understand how physiology functions, what are its constraints and specializations, what is integral to sustaining life, etc.

Animal Use: Although computer simulations exist for some biological topics, we cannot model what we do not fully understand. Scientists are continually discovering new gene splices, polymorphisms, hormone and receptor proteins, molecular interactions, epigenetic effects, cognitive abilities, etc. Hence, there is a lot that we still do not understand in biology! Else, all of the scientists would be out of work. But this also means that we cannot model the variations and idiosyncrasies inherent to animals. Furthermore, for those of you who aspire to academic, medical, veterinary, or related careers in biology, this hands-on experience is invaluable training. By the end of this course, you will be performing surgeries on live (anesthetized) animals. Since we are using animals, you are required to treat them with respect, while alive or during dissections. Photography and video capture are not allowed.

Class Cancellation: If class is cancelled due to school closure or any other reason, I will send you an email message instructing you on how we will adjust the schedule. Again, it is your responsibility to check your emails, as well as Moodle, on a regular basis.

Attendance: Sorry to be strict, but this is a course where missing lectures and especially labs can be highly detrimental to the learning experience. Hence, I have laid out the following policy: *Lectures:* You may miss 3 lectures without explanation. Attendance is taken at the start of class, so if you are late, it will count as an

absence. If you come in late, see me at the end of class, and it will only count as ½ an absence. After 3 absences, you start losing points (see below). *Labs*: Because lab experiments are integral to this course, and you work as a team, and many exercises involve the use of live animals that have to be sacrificed, it is imperative to attend all labs if at all possible. *Illness*: If you are too ill to attend a lecture or lab, then you must present a note or send me an email attesting to missing lab due to illness and invoking the honor code. *Scheduled absence*: If you are to miss class or lab due to a college-sanctioned event, or any other pre-planned activity, you must obtain permission from me in advance or it will count as an unexplained absence. *Note*: All discussions covered in class are fair game for exams, and I write exam questions at the end of each class, so missing any is not recommended.

Appropriate Apparel: You will be performing dissections and surgeries in lab and so please wear appropriate clothing. Always wear closed-toed shoes and pants, tie back long hair, and wear safety glasses.

Participation: I will not be grading participation directly, but I will randomly call on people in class to answer questions. So be warned, and come prepared!

Exams: Exams are closed book, and taken in class. During the exam, you are not allowed to leave the classroom or to have any notes or a phone in view.

Grading:

6 Quizzes (drop lowest):	4% each
4 Exams:	15% each
Laboratory *	20% total**

*(laboratory materials may also appear on quizzes and exams)
**(5% 1st report, 5% 2nd report, 5% final poster, 5% homework)

Grade Deductions:

- Failure to clean up you lab area: 1% each occurrence. This penalty applies to all members of the lab group, so you all share this responsibility. Check with me prior to leaving lab to be sure that all is cleaned appropriately.
- Failure to attend lectures (after reaching 3-lecture allowance), or failure to attend labs: lose 1% of overall grade for each occurrence
- Any missed tests or assignments, or those turned in late, will automatically receive a grade of zero if arrangements were not made in advance.

Academic Dishonesty: All work in this course is pledged and violations will be reported to the honor council. Furthermore, I reserve the right to assign a grade of zero for any assignment in which a student has been caught cheating. Be especially careful when it comes to plagiarism: always cite other people's ideas in your work, and always write your own assignments unless specifically told to write a joint assignment as a group. Furthermore, never examine other people's assignments or data unless specifically told to do so. Finally, in this course you will be asked to help evaluate some work of your class peers, and you are required to do so in an honest and impartial manner.

Tentative LECTURE Schedule*:

DATE	TOPIC	DUE
Aug 25 (W)	Syllabus, Introduction	
Aug 27 (F)	Internal/External Environments of Cells	
Aug 30 (M)	Sensing the Environment	
Sep 1 (W)	Sensing the Environment	
Sep 3 (F)	Sensing the Environment	Quiz 1
Sep 6 (M)	Labor Day – no class	
Sep 8 (W)	Nervous Systems	
Sep 10 (F)	Nervous Systems	
Sep 13 (M)	Nervous Systems	Quiz 2
Sep 15 (W)	Skeletal Muscle Systems	
Sep 17 (F)	Skeletal Muscle Systems	
Sep 20 (M)	Catch-up/Review Session	
Sep 22 (W)	Exam 1	
Sep 24 (F)	Smooth Muscle	
Sep 27 (M)	Digestive System	(Sept 28 – lab report 1)
Sep 29 (W)	Digestive System	
Oct 1 (F)	Digestive System	
Oct 4 (M)	Digestive System	Quiz 3
Oct 6 (W)	Metabolism & Temperature Regulation	
Oct 8 (F)	Metabolism/Respiratory System	
Oct 11 (M)	Respiratory System	
Oct 13 (W)	Respiratory System	Quiz 4
Oct 15 (F)	Respiratory System, Extreme Altitudes	
Oct 18 (M)	Fall Break – No Class	
Oct 20 (W)	Catch-Up/Review Session	
Oct 22 (F)	Exam 2	
Oct 25 (M)	Cardiovascular System	
Oct 27 (W)	Cardiovascular System	
Oct 29 (F)	Cardiovascular System	
Nov 1 (M)	Cardiovascular System	(Nov 2 – lab report 2)
Nov 3 (W)	Renal Physiology	Quiz 5
Nov 5 (F)	Renal Physiology	
Nov 8 (M)	Renal Physiology	Lab Group Project Proposal Due
Nov 10 (W)	Renal Physiology	Quiz 6
Nov 12 (F)	Extreme Salinities/Neuroendocrine	
Nov 15 (M)	Neuroendocrine Regulation	
Nov 17 (W)	Neuroendocrine Regulation	
Nov 19 (F)	Catch-Up/Review Session	
Nov 22 (M)	Exam 3	
Nov 24 (W)	Thanksgiving – No Class	
Nov 26 (F)	Thanksgiving – No Class	
Nov 29 (M)	Reproductive Systems	
Dec 1 (W)	Reproductive Systems	
Dec 3 (F)	Reproductive Systems	
Dec 6 (M)	TBA	(Dec 8 – Poster Presentation)
Dec 8 (W)	Catch-Up/Review Session	
Dec 11, Tues 5:30pm	FINAL EXAM (1/2 cumulative)	

*I reserve the right to make changes to the lecture and laboratory schedules, and likely will!

Tentative LAB Schedule*:

DATE	TOPIC	DUE
Aug 31	Instrumentation Lab	
Sep 7	Frog Sciatic Nerve Lab	Instrumentation Lab Homework
Sep 14	Comparative Skeletal Muscle Lab	Sciatic Nerve Lab Homework
Sep 21	Skeletal Muscle Biochemistry Lab	Skeletal Muscle Homework
Sep 28	Smooth Muscle Lab	Lab Report 1 (Skeletal Muscle)
Oct 5	Rat Surgery Demonstration Lab	Smooth Muscle Homework
Oct 12	Respiratory Function Lab	
Oct 19	Fall Break – No Class	
Oct 26	Blood Pressure & Arrhythmia Lab	
Nov 2	Renal Function Lab	Lab Report 2 (Respiration/BP& Arrhythmia)
Nov 9	Group Projects – Pitch Proposals	Nov 8 – proposals due
Nov 16	Group Projects – Conduct Experiments	
Nov 23	Make Up Day or Early Thanksgiving	
Nov 30	Group Projects – Work on Presentations	
Dec 7	Poster Presentations	Poster