SYLLABUS

BIOL 3440 – General Physiology

Meeting Times: Lecture - TTh 11:00 AM – 12:20 PM; Laboratory Th 1:00 – 3:50 PM
Instructor: Jim Harper, Ph.D.
Office Hours: MW 10 AM – 12 PM (LDB 100B)
Phone: 936-294-1543
Email: jmharper@shsu.edu

Suggested Texts

Animal Physiology; Hill, Wyse & Anderson, 3rd Edition
Animal Physiology; Schmidt-Nielsen, 5th Ed

- Note: the textbooks are excellent references but ***they will not be the primary source of lecture material***

Laboratory Materials

All of the laboratory exercises were written by Harper or AD Instruments and will be available on Blackboard; it is not necessary to purchase a lab manual for this course.

Course Overview

Course material emphasizes ***fundamental principles of organismal physiology using an integrative approach***; a working knowledge of genetics, cell biology and biochemistry, as well as basic evolutionary biology, will serve you well. The focus will be on eukaryotic organisms with an emphasis on animals, both invertebrate and vertebrate. Lecture material is often data intensive with much of the source material coming from the primary literature. You are expected to understand how to read and interpret data tables and graphs, and will be asked to do so in small groups periodically when learning specific concepts. At times, I will also discuss specific methodologies employed in physiological research; you will be given the necessary background to understand how the process works.

Please note the laboratory exercises for this course are meant only to complement the lecture material. In general, they are stand-alone and will sometimes cover material that we have not discussed extensively in lecture. In some cases, specific laboratory exercises will illustrate concepts presented in lecture, but the lecture material and laboratory exercises are rarely in sync due to timing and scheduling constraints. Because space is limited, and most of the lab exercises require some sort of division of labor, you will work together in groups of 3 – 5 to complete each lab. The particulars for each exercise will be discussed at the beginning of lab but please read it over prior to coming to class so that you are familiar with what you need to do. There is no reason a given lab cannot be completed in the time allotted.

Course objectives

- To learn fundamental principles of physiological function
- To learn the genetic, cellular and biochemical mechanisms underlying physiological processes
- To gain an understanding of the whys and hows of modern physiology

Particulars (also see Sam Houston State University Student Handbook and Appendix)

- Attendance:
  - Lecture: You are not required to come to lecture but it is likely in your best interest to attend. Many of the lecture slides will not make sense if you do not. In addition, on days when there is an in-class activity, you will miss any points associated with that assignment.
  - Laboratory: Attendance and participation in each laboratory exercise is required ***by all students***. If you fail to attend, you will not receive credit for whichever laboratory exercise(s) you miss. Likewise, if you simply sit to the side and allow your lab partners to do all the experimental work you will not receive credit for doing that lab.

- Lecture Notes: I will make ppt slides available on Blackboard; they are not a point-for-point outline of individual lectures.
- Grading: Final grades will be assigned based on ***your cumulative point total*** earned from each of the following:
    1. **Exams**: There will be 4 exams during the course of the semester. The fourth exam will take place during finals week, but it will not be a comprehensive final. Each exam will consist of up to 50 multiple choice questions whose focus will be on your conceptual understanding of the course material. You will not be asked to choose the best definition of homeostasis, for example; or to recognize specific equations, *et cetera.* Instead, you will be presented with data and/or other representations of specific principles and asked a series of questions relevant to that material.
    2. **Group Assignments:** As stated above, periodically you will be given in-class assignments to introduce and/or reinforce specific physiological principles. In short, we will break from lecture and individual groups will be tasked with solving problems/answering questions. This will be followed by a discussion period to ensure everyone has grasped the concept sufficiently. Group answers will be submitted prior to the discussion.
    3. **Laboratory**: About 30% of your final grade will be derived from the laboratory (50% for assignments; 50% for participation). **There are no lab exams**; instead, each lab group will be required to complete individual laboratory exercises and submit the associated assignment. Each assignment is due one week after the lab; for the final lab of the semester, the assignment will be due during finals week.

POINTS BREAKDOWN

Category	Number	Points Each	Total Points (possible)
Homework Assignments	4	100	**400**
Group Assignments			**150**
Laboratory Assignments	10	15	**150**
Laboratory Participation			**100**
			800

***dependent on course progress this number may be less than 8**

FINAL GRADE

Letter grades will be assigned based upon **total** points earned as follows:

Letter Grade	Number of Points
A	≥720
B	640 - 719
C	560 – 639
D	480 – 559
F	≤559

Use of Animals: This course is designed to introduce physiological principles important to organismal biology. A number of the laboratory exercises use *in vitro* models and/or student subjects; however, some use either mice or various invertebrates. All procedures involving mice have been approved by the SHSU Institutional Animal Care and Use Committee (https://www.shsu.edu/dept/office-of-research-and-sponsored-programs/compliance/iacuc/) and are in accordance with the Guide for the Care and Use of Laboratory Animals in Research (https://grants.nih.gov/grants/olaw/Guide-for-the-Care-and-Use-of-Laboratory-Animals.pdf). Invertebrates are not covered by the Animal Welfare Act of 1966, Animal Welfare Act Regulations, the Health Research Extension Act of 1985 (HREA); therefore, the use of these animals in teaching and/or research does not require authorization by the Institutional Animal Care and Use Committee. If you are uncomfortable with working with the animals directly, you may choose to abstain; however, you are still expected to complete the assignment associated with that exercise.

SPRING 2018 TENTATIVE LECTURE SCHEDULE

(NOTE: EXAM DATES MAY VARY DEPENDENT ON PROGRESS)

Date	Unit	Topic	Exams
1/18		Course Overview/What is Physiology	
1/23	Fundamentals Physiology	Membrane Dynamics I	
1/25		Membrane Dynamics II	
1/30		Cell Structure & Maintenance	
2/1		Intercellular Communication	
2/6		Enzymes & Physiological Function	
2/8		Physiological Buffering	
2/13			Exam 1
2/15	Nutrition, Digestion & Metabolism	Nutrition	
2/20		Digestive Physiology	
2/22		Cellular Metabolism	
2/27		Organismal Metabolism	
3/1		Scaling	
3/6		Thermoregulation & Metabolism	
3/8			Exam 2
SPRING BREAK – NO CLASS			
3/20	Osmotic Balance & Excretion	Osmoregulation	
3/22		Ion & Acid-Base Balance	
3/27		Excretory Systems	
3/29	Gas Exchange & Transport	Principles of Gas Exchange	
4/3		Respiratory Physiology	
4/5		Cardiovascular Transport	
4/10			Exam 3
4/12	Integrative Systems	Neurons & Synapses	
4/17		Sensory Physiology	
4/19		Endocrine & Neuroendocrine Systems	
4/24		Immunobiology	
4/26	Movement & Muscle	Contractile Apparatus	
5/1		Neuromuscular Junctions	
5/3		Coordinated Motor Control	
5/8	Finals Week		
5/10	Finals Week		Exam 4

SPRING 2017 LABORATORY SCHEDULE

(SUBJECT TO CHANGE)

Date	Week	Laboratory
1/18	1	No Lab
1/25	2	Standard Curve Calculations & Estimating Unknowns BCA Assay
2/1	3	Physiological Buffering Protein Concentration & Fluid Composition
2/8	4	Biological Membranes & Physiological Function (1) Osmotic Balance
2/15	5	Biological Membranes & Physiological Function (2) Membrane Integrity and Hemolysis
2/22	6	Digestive Physiology (1) Digestive anatomy of mouse/Tissue preparation
3/1	7	Digestive Physiology (2) Digestive enzymes in the mouse GI tract
3/8	8	Allometric Relationships Size, shape & Metabolism
3/15	**9**	**NO LAB SPRING RECESS**
3/22	10	Osmoregulation Osmotic Stress in Crayfish
3/29	11	Respiration & Metabolic Rate (1) Viscosity and Temperature
4/5	12	Respiration & Metabolic Rate (2) Neuroactive Compounds
4/12	13	Introduction to LabChart Student Heart Rate & Data Analysis
4/19	14	Integrative Physiology The Diving Reflex
4/26	15	Basic Electrophysiology The Nernst-Goldman Simulator
5/3	16	Neural Activity Cockroach neurophysiology
5/10	17	No Lab – Finals Week

APPENDIX – ACADEMIC CALENDAR/CLASS POLICIES/STUDENT CONDUCT

ACADEMIC CALENDAR:
http://www.shsu.edu/~reg_www/academic_calendar/

RESIGNATION NOTE:
Students may resign with a "W" grade from the 13th class day through the last class day, but prior to any final exams being taken or course completion.

DROP NOTE:
Courses may be dropped without a grade of "F" through the last class day, but prior to any final exams being taken or course completion. Students wishing to drop courses after the term's online drop deadline must submit a drop request form, signed by the professor, to the Registrar's Office. To process a "Q" drop after the online drop closes, students must come to the Registrar's Office, Estill Building Rm. 331 between the hours of 8:00 a.m. and 5:00 p.m. No schedule changes may be made after the deadline specified in the Academic Calendar.

I take violations against the Sam Houston State University Code of Student Conduct very seriously and will pursuit all available options in the event of a violation. Students are expected to engage in a manner that is above reproach and are expected to maintain complete honesty and integrity in the academic experiences both in and out of the classroom. Any student found guilty of dishonesty in any phase of academic work will be subject to disciplinary action ***at my discretion***. The university and its official representatives may initiate disciplinary proceedings against a student accused of any form of academic dishonesty including, but not limited to, cheating on an examination or other academic work which is to be submitted, plagiarism, collusion and the abuse of resource materials. **(**http://www.shsu.edu/students/guide/).

Visitors in the classroom: Only registered students may attend class. Exceptions can be made on a case-by-case basis by the professor. In all cases, visitors must not present a disruption to the class by their attendance. Students wishing to audit a class must apply to do so through the Registrar's Office.

Students with Disabilities: It is the policy of the university that no otherwise qualified disabled student shall, solely by reason of his/her handicap, be excluded from participation in, or denied benefits of, or be subject to discrimination under any academic or Student Life program or activity. Disabled students may request help with academically related problems stemming from individual disabilities by contacting their instructor, school/department chair, or by contacting the university Chair of the Committee for Continuing Assistance for Disabled Students/ Director of Counseling Center. A student with a disability is encouraged to register with the university Counseling Center, as well as contacting their instructor about assistance needs. Accommodation cannot be made until the student has initiated the request with the Counseling Center. Every semester that the student desires accommodations, it is the student's responsibility to complete a Classroom Accommodation Request Form at the Counseling Center and follow the stated procedure in notifying faculty. Accommodations for disabled students are decided upon documentation and need on a case-by-case basis by the Counseling Center. All requests are handled with confidentiality according to university procedures.

Religious Holy Days Policy: Section 51.911(b) of the Texas Education Code requires that the university excuse a student from attending classes or other required activities, including examinations, for the observance of a religious holy day, including travel for that purpose. A student whose absence is excused under this subsection may not be penalized for that absence and shall be allowed to take an examination or complete an assignment from which the student is excused within a reasonable time after the absence. University Policy 861001 provides procedures to be followed by the student and instructor. A student desiring to absent himself/herself from a scheduled class in order to observe (a) religious holy day(s) shall present to each instructor involved a written statement concerning the religious holy day(s). This request must be made in the first 15 days of the semester or the first 7 days of a summer session in which the absence(s) will occur. The instructor will complete a form notifying the student of a reasonable timeframe in which the missed assignments and/or examinations are to be completed.

Disruptive Behaviors: You are expected to adhere to the Sam Houston University Code of Student Conduct. I take violations against this code very seriously and will pursuit all available options if students violate this code. See below, or your handbook for details. Violations include but are not limited to:

a. talking out of turn in lecture,
b. obscene language,
c. reading the newspaper,
d. completing assignments other than Biology 134,
e. cell phones ringing,
f. answering cell phones,
g. text messaging,
h. cheating,
i. and plagiarism.

Class Attendance

1. Regular and punctual class attendance is expected of each student at Sam Houston State University.
2. Each faculty member will keep a record of student attendance.
3. Each faculty member will announce the policies for accepting late work or providing makeup examinations. Students are expected to show appropriate cause for missing or delaying major assignments or examinations.
4. A student shall not be penalized for three or fewer hours of absences when examinations or other assigned class work has not been missed; however, at the discretion of the instructor, a student may be penalized for more than three hours of absences.
5. Each instructor is obligated to clarify in writing to each student enrolled in class at the beginning of the semester or summer session the instructor's classroom policy regarding absences.
6. Class absences will be recorded and counted only from the actual day of enrollment for the individual student in that specific class.

FINAL NOTE

The Sam Center (http://www.shsu.edu/~sam_www/) is an outstanding resource available to students to assist with a host of academic and personal issues.