

Biology 436: Human Physiology Laboratory (Fall 2009) – Course Information

Prerequisite: Credit for or concurrent enrollment in Biology 336 or Biology 590

Required Texts: (Available at Aztec Book Shop)

1. *Lab Exercises for Human Physiology* – by Norgard-Sumnicht, Brandt, Sabbadini & Krown
2. *PhysioEx 8.0 for Human Physiology – Laboratory Simulations in Physiology* – by Stabler, Smith, Peterson & Lokuta

Recommended Reference Text:

Any basic physiology text book - I have placed a few, (by both Fox and Silverthorn) on reserve in Love Library.

Learning Objectives for Bio 436:

This is an **intensive** laboratory course designed to help prepare students who are planning on entering a physical therapy Ph.D. program, a scientific Masters or Ph.D. program or medical school. This course is NOT applicable as an introduction course to physiology. It is assumed that the students have a generally knowledge of chemistry and chemical reactions, and that they have taken or are currently enrolled in either Biol 336 (Principles of Human Physiology) or Biol 590 (Physiology of Human Systems).

After completion of the course the student should be able to demonstrate an **in depth** understanding of the concepts and mechanisms that our bodies use to help maintain homeostasis. At the cellular and biochemical level the student should understand how the physical properties of a molecule will dictate how the molecule is transported both into and out of a cell, realize the importance of pH and temperature with respect to an enzymes ability to work and understand how pH and temperature changes are related to the stability of all proteins in the body. Aspects of the nervous system that will be mastered include a basic understanding of the anatomy of the neuron and how action potentials are transmitted down the length of the axon. How the signals from neurons are translated to activation of skeletal muscle tissue and an understanding of how neurons and the central nervous system helps us to interpret not only changing conditions inside our body but outside as well and how we are equipped to respond to these changes. Students will explore and understand how analysis of our blood is used in a variety of settings to help to ascertain the health of an individual. At the tissue level, this course will focus on the cardiovascular, respiratory and renal systems to understand the anatomy and the functioning of these systems as they pertain to the maintenance of the homeostasis of the body at rest and during exercise.

This will be a very fast paced course and at times intensive, it is assumed that since you have already taken a physiology class (or are currently enrolled), that only comprehensive reviews of the material covered in the labs will be required and given. Being an upper division, undergraduate laboratory course also implies that you demonstrate a fairly "in depth" knowledge of physiology as determined by examination.

To do well in this course, you should keep up with the material on a weekly basis. Attend **all** lectures, take notes, go over your notes while the lecture is fresh in your mind, and use outside texts available on reserve to fill in gaps and correct ambiguities. Be sure you **understand the material**; memorizing facts without being able to integrate the facts and overall concepts will not help you pass the difficult exams. **One of the best ways to study for a class such as physiology is to teach what you have learned to a fellow classmate or friend, this often helps you to see areas that you thought you understood but really haven't mastered.**

Grading:

Exams: Two exams will be given (100 points each). The exams consist of both multiple choice and fill-in-the-blank questions. The second exam will NOT be cumulative. Each exam will cover the laboratory material and any related material covered in the lectures. See below for make-up policies.

Laboratory Quizzes: Laboratory Quizzes will be given at the beginning of **some** laboratory periods. They will be worth between 10-20 points and will be multiple choice format. The questions will consist of material covering previous lecture/laboratory exercise(s).

Laboratory Reports: Some labs will require group or individual laboratory reports (short answers or write-ups). The write-ups will consist of the collected data displayed in appropriately labeled graph form, with any conclusions or answers to questions from the exercise included.

Final Grades: Will be based on the following Grading Scale:

- 85% and above = A
- 75-84.9% = B
- 65-74.9% = C
- 55-64.9% = D
- 54.9% or below = F

MAKE-UP POLICY: NO LAB OR EXAM POINTS CAN BE MADE UP WITHOUT DOCUMENTATION (DOCUMENTATION DOES NOT INCLUDE E-MAILS TO ME). If you are ill or have suffered an injury **AND** you can provide a note from your physician, **AND** you either contact me or leave a message with the department office (LS 104, 594-6767) no later than the day of the lab/exam or before the next lab period, a make-up lab exercise/exam (style to be determined by the instructor) can be arranged to be given at the instructor's convenience **TO BE DONE WITHIN THE WEEK FOLLOWING THE EXERCISE/EXAM. ABSOLUTELY NO EXCEPTIONS - TO BE CONSIDERED FOR MAKE-UP POINTS - I WILL REQUIRE DOCUMENTATION FOR ANYTHING THAT IS MISSED (ACCEPTABLE DOCUMENTATION INCLUDES: PHYSICIANS NOTE, COPY OF HOSPITAL ADMITTANCE FORM, ETC.)!**

Furthermore, any wet-lab we perform ABSOLUTELY CANNOT be made up. however, many of the lab simulations can be completed on a computer at home. If you anticipate missing a lab for a legitimate reason (with documentation), see me at least a week in advance to arrange to attend a different lab section. If you are ill on the day of a lab please also contact me no later than the day of the lab. If you miss an exam or a lab, it will be averaged into your semester grade as a zero, unless, (1) you have an acceptable reason (accompanied by a note from your physician) for missing the exam or lab **and** (2) you either contact me or leave a message with the department office (LS 104, 594-6767) no later than the day of the exam or lab. Under these circumstances a make-up exam (style to be determined by the instructor) can be given at the instructor's convenience. For a missed lab, as long as there is documentation, a make-up assignment may be given. **DOCUMENTATION IS ABSOLUTELY REQUIRED - NO EXCEPTIONS!**
IMPORTANT NOTE: ATTENDANCE OF LABS IS MANDATORY! ATTENDANCE IS TAKEN AT EACH MEETING, AND MISSING MORE THAN ONE LAB WITHOUT A LEGITIMATE EXCUSE WILL RESULT IN A FAILING GRADE.

Fall 2009 Syllabus

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Office Hours: Available for appointments only. Appointments must be made at least one or two days in advance.

Week of:	Topic	(N) Norgard-Sumnicht, (S) Stabler
Aug. 31	Notebooks, Computers, Graphs & Homeostasis	(N) - Ex 1
Write-Up Sept. 7	No Class – But there will be Labs - Diffusion, Osmosis, Cell Membrane Permeability	(N) - Ex 2
14	Enzyme Function & Scope & Transport	(N) - Ex 3, (S) 1&8
Write-Up 21	Frog Sciatic Nerve Study	(N) - Ex 4, (S) 3***
28	Human Reflexes & Receptors	(N) - Ex 5
Write-Up Oct. 5	Frog Nerve-Skeletal Muscle Study	(N) - Ex 6
12	Exam 1 – Oct. 12th during Lecture Blood Analysis Simulation	(S) – 11 (BRING BOTH LAB MANUALS TO LAB)
19	Cardiac Muscle Demo & Simulation	(N) - Ex 7, (S) 6 (BRING BOTH LAB)

		MANUALS TO LAB)
26	CV Dynamics	(S) 5
Write-Up Nov. 2	Human Electrocardiograms	(N) - Ex 8
9	Human Respiratory Study (There will be Lecture – No Labs – But Lab Simulation to be done at Home)	(S) 7 & 10
16	Human Response to Exercise	(N) - Ex 9
23	No Class or Lab – Thanksgiving (Nov 25 th Furlough Day)	
30	Kidney Simulation	(S) 9 & 10 (BRING BOTH LAB MANUALS TO LAB)
Dec. 7	FINAL – During Lecture Time – No Labs	

* Norgard-Sumnicht et. al. - *Lab Exercises for Human Physiology*

** Stabler et.al. - PhysioEx 8.0

***This one particular simulation will only be done if the frogs do not arrive for the class.

Important Note: Attendance of labs is mandatory! Attendance is taken at each meeting, and **missing more than one lab without a legitimate excuse will result in a failing grade.**