

## BISC 330: Physiology, Spring 2015

### A. Logistics

Mode	Section	Day	Time	Room
Lecture	All	Tuesday, Thursday	8:00-9:15 am	323 Shoemaker
Laboratory	1	Monday	12-2:50	429 Shoemaker
Laboratory	2	Monday	3-5:50	429 Shoemaker
Laboratory	3	Tuesday	12:30-3:20	429 Shoemaker
Laboratory	4	Tuesday	3:30-6:20	429 Shoemaker

### B. Course Instructors

#### 1. Faculty

Mika Jekabsons, Ph.D.

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Phone: 915 3998

Office hours: Monday 10-11:30am, Thursday 9:30-11:00am, or by appointment

#### 2. Teaching Assistants

A. Lauren Fuller

B. Ariel Dauzart

### C. Course Texts

#### 1. Required Lecture textbook

Sherwood, L. Human Physiology, From Cells to Systems, 8<sup>th</sup> Edition, Brooks/Cole Publishing 2013

2. There is no required lab manual. All lab procedures are available online on Blackboard.

### D. Course Description

This is a one semester course in systemic physiology, with an emphasis on human physiology. The lecture is designed as a first course in physiology for Biology majors, assuming a fundamental understanding of cellular processes. It will explore some of the mechanisms important for cell, organ, and organ system function. Concepts from chemistry and cell biology will be integrated with those from organs and organ systems to establish the fundamental principles underlying organismal function. Information relevant to the function of most major organ systems will be covered in the lecture, and examples of physiological principles will be conducted in the laboratory.

### E. Learning Objectives

Upon completing this course, students should an understanding of the underlying mechanisms that bring about (a) nervous system function, (b) muscle function, (c) cardiovascular function, and (d) respiratory function. Time permitting, renal and digestive system functions will be covered, in which case students should also have an understanding of these systems. Students should have an understanding of how these systems interact to bring about homeostasis.

### F. Grading

1. Midterm 1	100
2. Midterm 2	100
3. 6 or 7 Quizzes (beginning of lab period)	60-70

4. Comprehensive Final Exam	200
5. 9 Abstracts	135

Midterms will generally be multiple choice, but short answer and/or essay questions are possible. You must bring the Scantron form 882-E for each midterm exam. The forms are available in the bookstore. Quizzes will be given during the first 15min of the laboratory period and will mainly be short answer and essay based on lecture material. Be punctual, as extra time will not be given if you are late.

Letter grades will be assigned as follows: **A:** 90-100%; **B:** 80-89.9%; **C:** 70-79.9%; **D:** 60-69.9%; **F:** <60%.

These are percentages of total possible points accumulated from both the in-class exams and the laboratory abstracts and quizzes. In the event that 10% of the class does not score 90% or higher, the A cutoff will be lowered until a minimum of 10% of the class receives an A. However this does come with restrictions, as the A cutoff will not be lowered below 85% of total possible points even if less than 10% of the class score greater than or equal to 85%. Therefore, you should expect that the minimum A will fall somewhere between 85-90%. In the event that the A cutoff is lowered below 90%, the range of all other letter grades will be increased from 9.9 to 10.9%. As an example, if the A's are greater than or equal to 87%, then the B range will be 76-86.9%, the C range 65-75.9%, the D range will be 54-64.9%, and scores less than 54% would receive an F. The greatest possible 'curve' applied to the class would be: A: greater than or equal to 85%, B: 74-84.9%, C: 63-73.9%, D: 52-62.9%, F: less than 52%. There is no possibility for extra credit in this course.

Note that I will use the +/- grading system for this course. The additional grades possible are: A-, B+, B-, C+, and C- (no D+, D-). It is important to know that a C- is not an adequate grade for those using Physiology as a prerequisite course for another class (e.g., Cell and Molecular Biology). Moreover, a C- is not a passing grade for Biology majors (and hence this course would need to be taken again). The +/- grading will be applied to students within two percentage points below a letter grade cutoff. Students falling short of a higher letter grade by 0.1-1.0% will receive the higher letter grade, designated with a 'minus'. Students falling short of a higher letter grade by 1.1-2.0% will receive the lower letter grade designated with a plus. For example, if the A cutoff is 87%, then an A- would be 86.0-86.9%, and a B+ would be 85.0-85.9%. The B range is then 76.0-84.9%.

## **G. Attendance and Policies**

1. Attendance is required for the first week of classes to determine the number of enrolled students. For the remaining lectures, attendance is highly recommended but not mandatory. Laboratory attendance is mandatory, and is restricted to the lab section in which you enrolled. Excused absences are limited to illnesses (with official documentation from a Health Care Professional) and University-sponsored trips (with documentation).
2. Laboratory attendance is mandatory. Each unexcused lab absence will result in a 25 pt deduction from your final point total (this is in addition to scoring a zero on your lab abstract and quiz for that week).
3. The laboratory sections do not meet during the first week of classes. Come to the laboratory prepared by reading all relevant material that covers the laboratory procedures.
4. Make-up exams will be given at the discretion of the instructor under the following circumstances: illness (with documentation), family emergency (with documentation and contact information), or University-sponsored event (with documentation and contact information). Make-up exams may differ by being predominantly in essay format.
5. Academic dishonesty, plagiarism, or other conduct of this nature will not be tolerated. Those plagiarizing any graded material (e.g., exam, quiz, abstract) will receive a score of zero for that material and/or be reported to the University Academic Discipline Committee.
6. All cell phones, pagers, etc. must be turned off during Lecture and Laboratory periods. This means that no text messaging, web surfing, or conversing via an electronic device is allowed at any time (including during exams and quizzes). By extension, no headphones/earbuds allowed during lectures and exams.
7. No eating, drinking, or using tobacco-related products in the Laboratory.
8. Quizzes will be administered during the first 15min of lab. Don't be late, as you will not be given extra time to take the quiz. Make-up quizzes will not be given, even with an excused absence; final grading will be adjusted for lost points.

9. The instructor reserves the right to adjust laboratory grades in the event of grading disparities between lab sections.

## **H. Lecture schedule of topics to be covered**

Week #	Dates	Lecture #	topics
1	1/22/15	1	Introduction, Levels of organization, Fluid compartments Chapter 1
2	1/27/15, 1/29/15	2, 3	Control systems; Membranes & Potentials Chapters 1, 3
3	2/3/15, 2/5/15	4, 5	Neural Physiology- action potentials, synaptic communication Chapter 4
4	2/10/15, 2/12/15	6, 7	Neural Physiology- types of neurons, organization of central and peripheral nervous systems Chapters 5, 6
5	2/17/15	8	Neural Physiology Chapters 5, 6
5	2/19/15	-	Midterm 1
6	2/24/15, 2/26/15	9, 10	Autonomic Nervous system; Neuromuscular junction- Chapter 7
7	3/3/15, 3/5/15	11, 12	Neuromuscular junction, Muscle Physiology- skeletal, Chapters 7, 8
8	3/10/15, 3/12/15	none	Spring break
9	3/17/15, 3/19/15	13, 14	Muscle Physiology- skeletal, Chapter 8
10	3/24/15, 3/26/15	15, 16	Muscle Physiology: Skeletal, Smooth; Chapter 8
11	3/31/15	17	Muscle Physiology: Cardiac, Chapter 9
11	4/2/15	-	Midterm 2
12	4/7/15, 4/9/15	18, 19	Muscle Physiology: Cardiac, Chapter 9; Cardiovascular Physiology- Chapter 10
13	4/14/15, 4/16/15	20, 21	Cardiovascular Physiology- Chapter 10
14	4/21/15, 4/23/15	22, 23	Cardiovascular Physiology- Chapter 10, Respiratory Physiology- Chapter 13
15	4/28/15, 4/30/15	24, 25	Respiratory Physiology- Chapter 13
16	5/5/15	final	final exam, 8am

This is a tentative schedule, and is subject to change. Lectures are in 323 Shoemaker.

## **I. Lab schedule of topics to be covered**

Week #	Date	Lab #	topics
1	1/19/15, 1/20/15	no labs	none
2	1/26/15, 1/27/15	1	Introduction; Lab 1: Instrumentation (Blackboard protocol)
3	2/2/15, 2/3/15	2	Lab2 Simple Reflexes (Blackboard protocol)
4	2/9/15, 2/10/15	3	Lab3 Complex Dive reflex (Blackboard protocol)
5	2/16/15, 2/17/15	no labs	
6	2/23/15, 2/24/15	4	Lab4 Sensory physiology (Blackboard protocol)
7	3/2/15, 3/3/15	5	Lab5 Muscle (Blackboard protocol)
8	3/9/15, 3/10/15	no labs	Spring break
9	3/16/15, 3/17/15	6	Lab6 Blood (Blackboard protocol)
10	3/23/15, 3/24/15	7	Lab7 Blood pressure (Blackboard protocol)
11	3/30/15, 3/31/15	no labs	
12	4/6/15, 4/7/15	8	Lab8 ECG and Exercise (Blackboard protocol)
13	4/13/15, 4/14/15	9	Lab9 Bicarbonate as buffer (Blackboard protocol)
14	4/20/15, 4/21/15	10	Lab10 Spirometry and Pulse Oximetry (Blackboard protocol)
15	4/27/15, 4/28/15	no labs	Turn in Lab 10 abstract
16	5/4/15, 5/5/15	no labs	finals week

Most laboratory exercises illustrate selected physiological principles using human volunteers. Therefore, come prepared to have your bodily functions recorded. Other exercises cover laboratory techniques commonly used throughout physiology, cell biology, and biochemistry. All lab procedures are available on Blackboard and should be printed prior to coming to the laboratory. Be sure to read all procedures and background material before coming to the lab. You will turn in a one page written abstract for each laboratory. Each abstract is due the following week at the beginning of lab; late abstracts will not be accepted. Each abstract is worth 15 points.