

University of Southern California – Department of Biological Sciences  
Human Biology 420L – Applied Human Physiology (4 units)  
Spring 2016

**Instructor:** Erik M. Kolb, Ph.D.  
**Office Hours:** Monday & Wednesday 11:00am – 1:00pm (AHF B39)  
**Email:** [ekolb@usc.edu](mailto:ekolb@usc.edu)

**Lecture:** MWF 9:00-9:50 am; MHP 106

**Course Description:**

The physiology of the respiratory, cardiovascular, renal, musculoskeletal, digestive, endocrine, and nervous systems in humans, with application to human health and pathology. *Course Prerequisite: BISC 220L.*

**Learning Objectives:**

1. To develop a deeper comprehension of physiological homeostasis in humans.
2. To understand and apply the scientific method, including forming hypotheses, designing experiments to test hypotheses, and collecting, analyzing, interpreting, and reporting data.
3. To inculcate critical thinking by using the application of knowledge in human physiology to solve both real-world and conceptual problems.
4. To place human physiology into an evolutionary context.

**I. Texts:**

***Required:***

- 1) **Human Physiology: An Integrated Approach.** 6<sup>th</sup> Silverthorn. Pearson Publishing, New York, NY, 2012.
- 2) **Laboratory Manual for Applied Systems Physiology** by Henige, K., and M. Matveyenko.

***For Further Reading:***

- 3) **Exercise Physiology: Human Bioenergetics and Its Applications.** 4<sup>th</sup> edition, Brooks, G.A., Fahey, T.D., and K.M. Baldwin. McGraw-Hill Companies, New York, NY, 2005.

**II. Grading Outline:**

10%	Midterm 1	100 pts.
15%	Midterm 2	150 pts.
20%	Midterm 3	200 pts.
25%	Final	250 pts.
5%	Active Learnings	50 pts.
25%	Lab	<u>250 pts.</u>
	<b>Total =</b>	<b>1000 pts.</b>
5%	<b>JEP Extra Credit</b>	<b>25 pts.</b>

▪ Exams and lab grades will not be given a letter grade. Only the final grade will be given a letter grade. The grading scale will be based on a traditional grading scale as follows:

<b>A</b> (≥94%)	<b>A-</b> (≥90%)	
<b>B+</b> (≥88%)	<b>B</b> (≥84%)	<b>B-</b> (≥80%)
<b>C+</b> (≥78%)	<b>C</b> (≥74%)	<b>C-</b> (≥70%)
<b>D+</b> (≥68%)	<b>D</b> (≥64%)	<b>D-</b> (≥60%)
<b>F</b> (≤59.9%)		

▪ A request to take a make-up exam must be accompanied by evidence of a university-sanctioned excused absence (i.e.: letter from a doctor, athletic release) and must be made **before** the date of the scheduled exam. Make-up exams will be different from the scheduled exam (e.g., essay) and may be proctored by personnel unfamiliar with the subject area.

**III. Laboratory Component**

**Lab Director:** Emi Emblar, Ph.D. ([eemblar@usc.edu](mailto:eemblar@usc.edu))  
**Lab Instructors:** Tamara Espinet, M.S. ([espinet@usc.edu](mailto:espinet@usc.edu)), Gudrun Floyd, M.S. ([gbfloyd@usc.edu](mailto:gbfloyd@usc.edu))

**IV. Tentative Lecture Schedule:**

<b>Date</b>	<b>Lecture Topic</b>	<b>Silverthorn (Chapters)</b>
Jan. 11	Introduction / Homeostasis	
Jan. 13	Membrane Physiology	5
Jan. 15	<b>Martin Luther King, Jr. Holiday</b>	
Jan. 18	Neurophysiology: Neurons	8
Jan. 20	Neurophysiology: Neurons	8
Jan. 22	Neurophysiology: Signal Transduction	8
Jan. 25	Muscle Physiology: Structure-Function Relationships	12
Jan. 27	Muscle Physiology: Structure-Function Relationships	12
Jan. 29	Muscle Physiology: Electrophysiology and Force Production	12
Feb. 1	Respiratory Physiology: Respiration	17
Feb. 3	Respiratory Physiology: Pulmonary Dynamics	17
Feb. 5	Respiratory Physiology: Pulmonary Dynamics / <b>Active Learning I</b>	17
Feb. 8	<b>Midterm I</b>	
Feb. 10	Cardiovascular Physiology: The Heart	14
Feb. 12	Cardiovascular Physiology: The Heart	14
Feb. 15	<b>President's Day Holiday</b>	
Feb. 17	Cardiovascular Physiology: Vascular Dynamics	15
Feb. 19	Oxygen Transport and Gas Exchange	18
Feb. 22	Oxygen Transport and Gas Exchange	18
Feb. 24	<b>Guest Lecture: Dr. Nabil Hanna – Heart Failure</b>	
Feb. 26	Regulation of Ventilation and Circulation	16/18
Feb. 29	Regulation of Ventilation and Circulation	16/18
Mar. 2	Exercise: Pulmonary and Cardiovascular Dynamics	
Mar. 4	Exercise: Pulmonary and Cardiovascular Dynamics / <b>Active Learning II</b>	
Mar. 7	<b>Midterm II</b>	
Mar. 9	Renal Physiology: The Nephron	19
Mar. 11	Renal Physiology: The Nephron	19
Mar. 14-20	<b>Spring Break</b>	
Mar. 21	Osmoregulation and Blood Pressure	20
Mar. 23	Osmoregulation and Blood Pressure	20
Mar. 25	Digestive Physiology	21
Mar. 28	Digestive Physiology	21
Mar. 30	Digestive Physiology	21
Apr. 1	Thermoregulation: Hyperthermia vs. Hypothermia	22
Apr. 4	Thermoregulation: Exercise	22
Apr. 6	Endocrinology I: Hypothalamus and Pituitary	7
Apr. 8	Endocrinology I: Hypothalamus and Pituitary / <b>Active Learning III</b>	7
Apr. 11	<b>Midterm III</b>	
Apr. 13	Endocrinology II: Hormones, Homeostasis, and Pathology	7

Apr. 15	Endocrinology II: Hormones, Homeostasis, and Pathology	7
Apr. 18	Male Reproductive Physiology: Spermatogenesis	26
Apr. 20	Female Reproductive Physiology: Oogenesis	26
Apr. 22	Female Reproductive Physiology: The Menstrual Cycle	26
Apr. 25	The Physiology of Altitude: Hypobarica	
Apr. 27	The Physiology of Altitude: Hypobarica and Exercise / <b>Active Learning IV</b>	
Apr. 29	Diving Physiology: Hyperbarica	
May 6	<b>FINAL EXAMINATION 11:00 a.m. – 1:00 p.m.</b>	

#### **V. Academic Accommodations:**

Any student requesting academic accommodations based on a disability are required to register with Disability Services and Programs (DSP) each semester. A letter of verification for approved accommodations can be obtained from DSP. Please be sure the letter is delivered to me (the instructor) as early in the semester as possible. DSP is located in Student Union (STU) 301 and is open 8:30-5:00pm Monday – Friday. The phone number for DSP is (213) 740-0776.

#### **VI. Academic Integrity:**

Students who violate University standards of academic integrity are subject to disciplinary sanctions, including failure in the course and suspension from the University. Since dishonesty in any form harms the individual, other students and the University, academic integrity policies will be strictly enforced. I expect you will familiarize yourself with the Academic Integrity guidelines found in the current SCampus.

#### **VII. Academic Integrity Violations:**

- Academic dishonesty/misconduct (plagiarism, cheating, unauthorized collaboration, etc.) will not be tolerated. All academic integrity violations will result in a grade sanction and will be reported to the Office for Student Judicial Affairs. It is your responsibility to “reasonably” protect your own work from the plagiarism of others.
- If plagiarism is detected on a group project, all members of the group will be held responsible.
- You are expected to be familiar with the Academic Integrity guidelines found in the current SCampus (student guidebook). An electronic version is available at <http://usc.edu/scampus>.

#### **VIII. Disruptive and Threatening Student Behavior:**

Behavior that persistently or grossly interferes with classroom activities is considered disruptive behavior and may be subject to disciplinary action. Such behavior inhibits other students’ ability to learn and an instructor’s ability to teach. A student responsible for disruptive behavior may be required to leave class pending discussion and resolution of the problem and may be reported to the Office of Student Judicial Affairs for disciplinary action.

#### **IX. Blackboard**

Notes will be periodically posted on blackboard. However, the information posted on blackboard is not the only material that will be on the exam. If you attend class regularly you will be updated on the status of lecture notes and course material/announcements.

#### **X. Electronic Devices**

Please turn off or disable all cell phones or other electronic communication devices during class time. Using a laptop in class to take lecture notes is permitted. However, please turn off your browser, email, messaging and any other programs that do not involve the course material.