

**University of Southern California – Human and Evolutionary Biology**  
**HBIO 205Lxg – The Science of Sport (4 Units)**  
**Fall 2019**

**Instructor:** Bob Girandola, Ed.D.

Office Hours: Tu and Wed 11:00 AM – 12:00 PM, PED 109

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**Lecture:** 9:00-9:50 MWF WPH B 27  
10:00-10:50 MWF WPH B 27

**Laboratory:** (All in PED B16)  
M: 2:00 PM – 3:50 PM  
T: 8:00 AM - 9:50 AM, 10:00 AM - 11:50 AM, 12:00 PM - 1:50 PM  
Th: 8:00 AM - 9:50 AM, 10:00 AM - 11:50 AM, 12:00 PM - 1:50 PM  
F: 10:00 AM - 11:50 AM , 12:00 PM - 1:50 PM, 2:00 PM – 3:50 PM

**Course Description:**

This course will deal with the physiological and nutritional basis of human performance. It will be a combination of lecture and laboratory exercises to better help students understand the factors that facilitate and limit optimal performance. It is not a course aimed solely at elite students, but also the typical individual who has the desire to exercise and wishes to better understand that factors that are involved in exercise tolerance. *Not available for major credit.*

**Recommended Text (Optional):**

1) **Physiology of Sport & Exercise** by W.L.Kenney, J. Wilmore & D.L. Costill

**Required Lab Manual:**

2) **Laboratory Manual for the Science of Human Performance** by Kim Henige, Ed.D

**I. Objectives:**

- A. To understand the physiological and nutritional factors that facilitate and limit optimal performance.
- B. To gain knowledge in health, exercise and nutrition related issues for healthy life-style decisions.

**II. Class Schedule:**

<b>Week</b>	<b>Topic</b>
1	Metabolism
2	Metabolism
3	Energy Demand
4	Energy Intake & Weight Control
5	Weight Control, Obesity – First Exam

6	Nutrition & Performance
7	Drugs & Ergogenic Aids
8	Pulmonary Function
9	Pulmonary Function & Cardiovascular
10	Cardiovascular – Second Exam
11	Oxygen Consumption
12	Muscular System
13	Environmental Physiology
14	Environmental Physiology
15	Environmental Physiology
	<b>FINAL EXAM</b>

### **III. Grading and Grading Scale:**

1. First mid-term – 25% (after 5 weeks)
2. Second mid-term – 25% (after 10 weeks)
3. Final Exam – 25%
4. Laboratory Grade – 25%

\***Exact** Dates for first two exams will be announced in class.

**Grading Scale:** Each exam will be curved and assigned a letter grade based upon the following criteria:

- Average score = C
- Average score + 1 Standard Deviation (SD) = B
- Average score + 2 SD = A
- Average score – 1 SD = D
- Average score – 2 SD = F

### **IV. Course Make-up Policy:**

IF a student has a legitimate excuse for missing one of those exams, a make-up exam in ESSAY format will be given at a mutual date determined by the instructor and student.

### **V. Laboratory Component:**

**Lab Director:** Emi Embler Ph.D. ([eembler@usc.edu](mailto:eembler@usc.edu))

**Lab Instructors:**

Tamara Espinet ([espinet@usc.edu](mailto:espinet@usc.edu))

Bara Floyd ([gbfloyd@usc.edu](mailto:gbfloyd@usc.edu))

### **Tentative Lecture Schedule:**

Week	Lecture Topic	Reading
Aug 26	Metabolism: The production of ATP. How do muscle cells convert Carbohydrates, Fats, and Proteins into useable energy (ATP)? – Glycolysis; Aerobic metabolism: Krebs Cycle and Cytochrome Chain	Intro + Ch 2
Sept 2	Energy Demands: The caloric cost of both rest and activity. Principles related to resting and basal metabolic rate (RMR and BMR) – Resting metabolic rate; Caloric cost of various activities; Individual variations <b>Monday Sept 2 is Labor day, USC holiday</b>	Ch. 2,5
Sept 9	Energy Intake: Caloric cost of foods and beverages. Caloric balance. Caloric cost of carbohydrates, fats, proteins, and alcohol; Concepts of caloric balance	Ch. 5,22
Sept 16	Weight Control: How does an individual gain or lose weight? Separating fact from fiction. Concepts of weight loss with dietary restriction and exercise; Myths of weight control, especially weight loss; Drugs and other substances used for weight loss; Concepts of weight gain. How does fat-free mass increase?	Ch. 15,22
Sept 23	Obesity: The etiology of obesity – How do people get fat?; Genetic verses environment; Trends in the U.S. and the world; Possible solutions	Ch. 22
Sept 30	Obesity: The etiology of obesity – How do people get fat?; Genetic verses environment; Trends in the U.S. and the world; Possible solutions. <b>FIRST MIDTERM EXAM will most likely be this week.</b>	
Oct 7	Nutrition: For optimal health and for human performance – What is an ideal diet; The caloric nutrients: Fat, Carbohydrate, Protein; The non-caloric nutrients: Vitamins and Minerals; Dietary programs that effect human athletic performance; Nutrient supplements and ergogenic aids	Ch. 15,16
Oct 14	Nutrition: For optimal health and for human performance – What is an ideal diet; The caloric nutrients: Fat, Carbohydrate, Protein; The non-caloric nutrients: Vitamins and Minerals; Dietary programs that effect human athletic performance; Nutrient supplements and ergogenic aids ( <b>Oct 17-18 Fall Recess</b> )	Ch. 15,16
Oct 21	Pulmonary system as it is affected by exercise – Anatomy of the system; Lung volumes; Ventilation; Gas exchange; Hemoglobin	Ch. 7,8
Oct 28	The Cardiovascular system as it is affected by exercise – Discussion of the heart, blood vessels and blood; Cardiovascular dynamics during rest and exercise; The cardiovascular system as a limiting factor in aerobic exercise; Cardiovascular benefits of exercise: coronary heart disease	Ch. 6,8
Nov 4	The Cardiovascular system as it is affected by exercise – Discussion of the heart, blood vessels and blood; Cardiovascular dynamics during rest and exercise; The cardiovascular system as a limiting factor in aerobic exercise; Cardiovascular benefits of exercise: coronary heart disease. <b>SECOND MIDTERM EXAM This week!</b>	Ch. 6,8
Nov 11	Oxygen consumption during exercise of various intensities – The use of oxygen consumption (VO <sub>2</sub> ) to determine metabolic cost, intensity, and type of fuel; The concept of VO <sub>2</sub> Max to determine athletic potential and the effects of	Ch. 11

	training; The lactate threshold as an indicator of endurance potential or anaerobic power	
Nov 18	Oxygen consumption during exercise of various intensities – The use of oxygen consumption (VO <sub>2</sub> ) to determine metabolic cost, intensity, and type of fuel; The concept of VO <sub>2</sub> Max to determine athletic potential and the effects of training; The lactate threshold as an indicator of endurance potential or anaerobic power	Ch. 11
Nov 25	Environmental Physiology <b>Nov 27-30 Thanksgiving Holiday – USC holiday</b>	Ch 12,13
Dec 2	The environment and its effect on human performance – Exercise at altitude; Exercise in a hot environment; Exercise in a cold environment; Exercise and air pollution. <b>Classes end Dec 6</b>	Ch. 12,13
Dec 3-10	<b>FINAL EXAM</b> dates: Section 38411 (MWF 10:00 AM) – Mon Dec 16, 8-10 AM Section 38420 (MWF 9:00 AM) – Mon Dec. 16 , 11-1 pm	

## Statement on Academic Conduct and Support Systems

### Academic Conduct:

Plagiarism – presenting someone else’s ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in SCampus in Part B, Section 11, “Behavior Violating University Standards” [policy.usc.edu/scampus-part-b](http://policy.usc.edu/scampus-part-b). Other forms of academic dishonesty are equally unacceptable. See additional information in SCampus and university policies on scientific misconduct, [policy.usc.edu/scientific-misconduct](http://policy.usc.edu/scientific-misconduct).

### Support Systems:

*Student Health Counseling Services - (213) 740-7711 – 24/7 on call*

[engemannshc.usc.edu/counseling](http://engemannshc.usc.edu/counseling)

Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention.

*National Suicide Prevention Lifeline - 1 (800) 273-8255 – 24/7 on call*

[suicidepreventionlifeline.org](http://suicidepreventionlifeline.org)

Free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week.

*Relationship and Sexual Violence Prevention Services (RSVP) - (213) 740-4900 – 24/7 on call*

[engemannshc.usc.edu/rsvp](http://engemannshc.usc.edu/rsvp)

Free and confidential therapy services, workshops, and training for situations related to gender-based harm.

*Office of Equity and Diversity (OED) | Title IX - (213) 740-5086*

[equity.usc.edu](http://equity.usc.edu), [titleix.usc.edu](http://titleix.usc.edu)

Information about how to get help or help a survivor of harassment or discrimination, rights of protected classes, reporting options, and additional resources for students, faculty, staff, visitors, and applicants. The university prohibits discrimination or harassment based on the following protected characteristics: race, color, national origin, ancestry, religion, sex, gender, gender identity, gender expression, sexual orientation, age, physical disability, medical condition, mental disability, marital status, pregnancy, veteran status, genetic information, and any other characteristic which may be specified in applicable laws and governmental regulations.

*Bias Assessment Response and Support - (213) 740-2421*

[studentaffairs.usc.edu/bias-assessment-response-support](http://studentaffairs.usc.edu/bias-assessment-response-support)

Avenue to report incidents of bias, hate crimes, and microaggressions for appropriate investigation and response.

*The Office of Disability Services and Programs - (213) 740-0776*

[dsp.usc.edu](http://dsp.usc.edu)

Support and accommodations for students with disabilities. Services include assistance in providing readers/notetakers/interpreters, special accommodations for test taking needs, assistance with architectural barriers, assistive technology, and support for individual needs.

*USC Support and Advocacy - (213) 821-4710*

[studentaffairs.usc.edu/ssa](http://studentaffairs.usc.edu/ssa)

Assists students and families in resolving complex personal, financial, and academic issues adversely affecting their success as a student.

*Diversity at USC - (213) 740-2101*

[diversity.usc.edu](http://diversity.usc.edu)

Information on events, programs and training, the Provost's Diversity and Inclusion Council, Diversity Liaisons for each academic school, chronology, participation, and various resources for students.

*USC Emergency - UPC: (213) 740-4321, HSC: (323) 442-1000 – 24/7 on call*

[dps.usc.edu](http://dps.usc.edu), [emergency.usc.edu](http://emergency.usc.edu)

Emergency assistance and avenue to report a crime. Latest updates regarding safety, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible.

*USC Department of Public Safety - UPC: (213) 740-6000, HSC: (323) 442-120 – 24/7 on call*

[dps.usc.edu](http://dps.usc.edu)

Non-emergency assistance or information.