

**University of Southern California – Human and Evolutionary Biology**  
**HBIO 205Lxg – The Science of Sport (4 Units)**  
**Spring 2020**

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

Office Hours: T/W 11:00 AM – 12:00 PM, PED 109

Email: [girandol@usc.edu](mailto:girandol@usc.edu)

Telephone: (213) 740-6151

**Lecture:** 9:00-9:50 MWF (38411) WPH B27  
9:30-10:50 T TH (38420) THH 102

**Laboratory:** (All in PED B16)

M: 9:00 AM – 10:50 AM

T: 10:00 AM - 11:50 AM, 12:00 PM - 1:50 PM, 2:00 PM - 3:50 PM,  
4:00 PM - 5:50 PM, 6:00 PM – 7:50 PM

Th:, 12:00 PM - 1:50 PM, 6:00 PM - 7:50 PM

F: 10:00 AM - 11:50 AM, 12:00 PM - 1:50 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
	<b>Spring Break</b>
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:**

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

**Tentative Lecture Schedule:**

<b>Week</b>	<b>Lecture Topic</b>	<b>Reading</b>
Jan 13	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
Jan 20	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, Jan. 20 is a University Holiday, MLK Day.</b>	Ch. 2,5
Jan 27	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
Feb 3	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
Feb10	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
Feb 12	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>	
Feb 17	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>Monday Feb 17 is Presidents Day, University holiday.</b>	Ch. 15,16
Feb 24	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
Mar 2	Pulmonary system as it is affected by exercise – Anatomy of the system; Lung volumes; Ventilation; Gas exchange; Hemoglobin	Ch. 7,8
Mar 9	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
Mar 16	<b>SPRING BREAK Spring break is March 16-20</b>	
Mar 23	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</b>	Ch. 6,8

	<b>MIDTERM EXAM This week!</b>	
Mar 30	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
Apr 6	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
Apr 13	Environmental Physiology	Ch 12,13
Apr 20- May 1	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. Classes end May 1	Ch. 12,13
May 3- 10	<b>FINAL EXAM</b> dates: Section 38411 (MWF 9:00 AM) – Friday, May 8, 8:00 AM – 10:00 AM Section 38420 (T Th 9:30 AM) – Tuesday, May 12, 8:00 AM – 10:00 AM	

## 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:

*Counseling and Mental Health - (213) 740-9355 – 24/7 on call*

[studenthealth.usc.edu/counseling](http://studenthealth.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) 740-9355(WELL), press “0” after hours – 24/7 on call*

[studenthealth.usc.edu/sexual-assault](http://studenthealth.usc.edu/sexual-assault)

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

*Office of Equity and Diversity (OED) - (213) 740-5086 | Title IX – (213) 821-8298*

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

Information about how to get help or help someone affected by harassment or discrimination, rights of

protected classes, reporting options, and additional resources for students, faculty, staff, visitors, and applicants.

*Reporting Incidents of Bias or Harassment - (213) 740-5086 or (213) 821-8298*

[usc-advocate.symplicity.com/care\\_report](https://usc-advocate.symplicity.com/care_report)

Avenue to report incidents of bias, hate crimes, and microaggressions to the Office of Equity and Diversity |Title IX for appropriate investigation, supportive measures, and response.

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

[dsp.usc.edu](https://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 Campus Support and Intervention - (213) 821-4710*

[campussupport.usc.edu](https://campussupport.usc.edu)

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

Non-emergency assistance or information.

*Office of the Ombuds - (213) 821-9556 (UPC) / (323-442-0382 (HSC)*

[ombuds.usc.edu](https://ombuds.usc.edu)

A safe and confidential place to share your USC-related issues with a University Ombuds who will work with you to explore options or paths to manage your concern.