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

Instructor: Bob Girandola, Ed.D.
Office Hours: Tu and Wed 11-12 in PED 109
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Lecture: 9:00-9:50 MWF WPH B 27
10:00-10:50 MWF THH 102

Laboratory: (All in PED B16)
M: 2-3:50
T: 8-9:50a, 10-11:50a, 12-1:50p, 2-3:50p
Th: 10-11:50a, 12-1:50p, 2-3:50
F: 10-11:50a, 12-1:50p, 2-3:50p

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.*

*Hybrid model for fall 2020:

This course is being offered as a hybrid class this semester. Students will have the option of attending class one time per week and then attending class online for the other two classes of that same week. This is because classrooms can only accommodate 30 students at a time. With 90 students in the class, this means that each student will be allowed to attend lectures in-person once per week. You may also attend all lectures online if you wish.

All laboratories will be offered online only!!

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. Learning Objectives:

•to describe the structure/function of organ systems that facilitate and limit human exercise performance

•to relate the knowledge of physiology and nutrition to muscle and physical performance

•to use research articles to defend a scientific argument

•to answer research questions using biological instrumentation, report data and discuss results

•to recommend ways by which nutrition can optimize muscle and physical performance in different socioeconomic environments

•to discover and discuss the impact of human diversity as manifested by age, disability, gender, ethnicity and social status on human muscle and physical performance

II. Class Schedule:

Week	**Topic**
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
	FINAL EXAM

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: Anh-Khoi Nguyen, Ph.D. (agnguyen@usc.edu)
Lab Instructors:
Alexis Camacho: ascamach@usc.edu
Joshua Carlos: jcarlos6@usc.edu
Helaine Lopes: lopes@usc.edu

Tentative Lecture Schedule:

Week	Lecture Topic	Reading
Aug 17	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

Aug 24	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	Ch. 2,5
Aug 31	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 7	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? **Sept 7, Monday is Labor Day, University holiday**	Ch. 15,22
Sept 14	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 21	Obesity: The etiology of obesity – How do people get fat?; Genetic verses environment; Trends in the U.S. and the world; Possible solutions. **FIRST MIDTERM EXAM will most likely be this week.**	
Sept 28	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 5	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 (**Oct 17-18 Fall Recess)**	Ch. 15,16
Oct 12	Pulmonary system as it is affected by exercise – Anatomy of the system; Lung volumes; Ventilation; Gas exchange; Hemoglobin	Ch. 7,8
Oct 19	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 **SECOND MIDTERM EXAM THIS WEEK**	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	Ch. 6,8

Nov 11	Oxygen consumption during exercise of various intensities – The use of oxygen consumption (VO_2) to determine metabolic cost, intensity, and type of fuel; The concept of VO_2 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 11	Oxygen consumption during exercise of various intensities – The use of oxygen consumption (VO_2) to determine metabolic cost, intensity, and type of fuel; The concept of VO_2 Max to determine athletic potential and the effects of training; The lactate threshold as an indicator of endurance potential or anaerobic power	Ch. 11
Nov11	Environmental Physiology	Ch 12,13
Nov 11	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 Nov 15**	Ch. 12,13
Nov 17-24	**FINAL EXAM** dates: Section 38411 (MWF 10:00 AM) – Section 38420 (MWF 9:00 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. Other forms of academic dishonesty are equally unacceptable. See additional information in SCampus and university policies on scientific misconduct, policy.usc.edu/scientific-misconduct.

Support Systems:

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

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
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, 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
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
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
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
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, 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
Non-emergency assistance or information.