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

Instructor: Bob Girandola, Ed.D.
Office Hours: Wednesday 8:00 AM – 9:00 AM; Thursday 11:00 AM – 12:00 PM, PED 109
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Lecture: 9:00 AM - 9:50 AM; MWF; WPH B27
9:30 AM - 10:50 AM; T TH; THH 202

Laboratory: 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
W: 2:00 PM – 3:50 PM
Th: 12 :00 PM – 1:50 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:

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
	Spring Break
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: Emi Embler Ph.D. (eembler@usc.edu)
Lab Instructors:
Tamara Espinet (espinet@usc.edu)
Bara Floyd (gbfloyd@usc.edu)
Ricky Hang (rhang@usc.edu)

Tentative Lecture Schedule:

Week	Lecture Topic	Reading
Jan 7	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 14	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
Jan 21	Energy Intake: Caloric cost of foods and beverages. Caloric balance. Caloric cost of carbohydrates, fats, proteins, and alcohol; Concepts of caloric balance. **Monday, Jan 21 is holiday, MLK day**	Ch. 5,22
Jan 28	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
Feb 4	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 11	Obesity: The etiology of obesity – How do people get fat?; Genetic verses environment; Trends in the U.S. and the world; Possible solutions.5 **FIRST MIDTERM EXAM will most likely be this week.**	
Feb 18	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 **Feb 18 is Presidents Day, University holiday**	Ch. 15,16
Feb 25	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 4	Pulmonary system as it is affected by exercise – Anatomy of the system; Lung volumes; Ventilation; Gas exchange; Hemoglobin	Ch. 7,8
Mar 11	**SPRING BREAK Spring break is March 11-17**	
Mar 18	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 25	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 Most likely This week!**	Ch. 6,8
Apr 1	Oxygen consumption during exercise of various intensities – The use of oxygen consumption (VO_2) to determine metabolic cost, intensity, and type of	Ch. 11

	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	
Apr 8	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
Apr 15	Environmental Physiology	Ch 12,13
Apr 22	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 APRIL 26	Ch. 12,13
May 4-12	**FINAL EXAM** dates: Section 38411 (MWF 9:00 AM) – Friday, May 3, 8:00 AM -10:00 AM Section 38420 (T Th 9:30 AM) – Tuesday, May 7, 8:00 AM -10:00 AM	

VII. 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.

VIII. 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.

IX. 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.

X. 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.