

USC Dornsife
College of Letters,
Arts and Sciences

**HBIO401L – Physiology and Biomechanics of Movement
(4 units)**

Spring 2018

Lecture: T/Th 8:00-9:20 a.m.

Location: VKC 157

Laboratory: Th 5:00-7:50 PM

Location: PED B16

Instructor: Gioia Polidori Francisco, PhD

Office: AHF B-10E

Office Hours: Tue & Thu 9:30-11:30 am

Contact Info: gpolidor@usc.edu

Laura Held, PhD

Office Hours: TBD

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Lab Director: Emi Embler, PhD

Course Description

The study of human movement including (1) bioenergetics, circulation, respiration, and the musculoskeletal system, (2) effects of exercise and training on those systems, and (3) basic laws of motion and analysis of sports locomotion. Prerequisite: MATH 108.

Learning Objectives

- Develop a deeper understanding of the central and cross-disciplinary concepts of human biology, which in this course include: bioenergetics, physiological homeostasis and the interrelationship between form and function for the endocrine, cardiovascular, musculoskeletal and nervous systems.
- Develop critical thinking and problem solving skills, using an interdisciplinary approach to understanding complex human movement by exploring cause-effect relationships governing human performance.
- Demonstrate proficiency in modern research methodologies that involve analyzing human movement, quantifying and interpreting physiological & biomechanical variables.
- Improve oral, written, and electronic communication & technical presentation skills
- Apply biological and physiological knowledge towards the resolution of ethical and social issues.
- Provide sufficient knowledge and skill for entry-level employment in a wide variety of fields in the health professions or other biology-related disciplines.

Required Text:

Powers, S. and E. Howley, E. (2011). Exercise physiology: theory and application to fitness and performance (9th ed.). New York, NY: McGraw-Hill.

Description and Assessment of Assignments

- Class material will be evaluated via quizzes and exams.
- Material covered in labs will be evaluated via laboratory exercises and quizzes as well as classroom exams.

Grading Breakdown:

Assignment	% of Grade
Midterm 1	20
Midterm 2	20
Final Exam	30
Lab	25
Quizzes	5
TOTAL	100
JEP (extra Credit)	2.5

Additional Policies

- The grading scale is based on the traditional scale as follows:

	A (≥ 93.00%)	A- (≥ 90.00%)
B+ (≥ 87.00%)	B (≥ 83.00%)	B- (≥ 80.00%)
C+ (≥ 77.00%)	C (≥ 73.00%)	C- (≥ 70.00%)
D+ (≥ 67.00%)	D (≥ 63.00%)	D- (≥ 60.00%)
F (≤ 59.99%)		

- A midterm exam can be taken after the specified date **ONLY** if the student has a **documented** medical excuse.
- Exams and lab grades will not be given a letter grade. Only the final grade will be given a letter grade.
- Quizzes will be given in 2 forms:
 1. A 2-question quiz will be given during the *first 5 minutes* of each lecture. Questions will be based on the material covered in the previous lecture. Each quiz will be worth 2 points: 1 point for each correct response, 0.5 points for each incorrect response.
 2. During lectures and based on the material discussed.

Individuals who do not take the quiz will get 0 points. **NO LATE QUIZZES WILL BE GIVEN.**

- The final exam is ***cumulative***.
- A request to take a make-up exam must be accompanied by evidence of necessity (ie: letter from a doctor, plane ticket to a game from an athlete) and must be made ***before*** the date of the scheduled exam. Make-up exams will be different from the scheduled exam and may be proctored by personnel who do not have extensive knowledge in the area being tested.
- Notes will **NOT** be posted on blackboard. Class notes and textbook information will form the basis of the material that will be on the exams. If you attend class regularly, you will be updated on the status of lecture notes and course material/announcements.

- The only extra credit offered for this course is JEP. JEP is the oldest and largest university service-learning program in the country. It offers students the unique opportunity to combine academic coursework with experiences in the community surrounding the campus. At the beginning of the semester, a JEP representative will visit our class and tell you more about the opportunities available that semester. To register for JEP, visit <http://dornsife.usc.edu/joint-educational-project/>.

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 Section 11, *Behavior Violating University Standards* <https://scampus.usc.edu/1100-behavior-violating-university-standards-and-appropriate-sanctions/>. Other forms of academic dishonesty are equally unacceptable. See additional information in *SCampus* and university policies on scientific misconduct, <http://policy.usc.edu/scientific-misconduct/>.

Discrimination, sexual assault, and harassment are not tolerated by the university. You are encouraged to report any incidents to the *Office of Equity and Diversity* <http://equity.usc.edu/> or to the *Department of Public Safety* <http://capsnet.usc.edu/department/department-public-safety/online-forms/contact-us>. This is important for the safety whole USC community. Another member of the university community – such as a friend, classmate, advisor, or faculty member – can help initiate the report, or can initiate the report on behalf of another person. *The Center for Women and Men* <http://www.usc.edu/student-affairs/cwm/> provides 24/7 confidential support, and the sexual assault resource center webpage sarc@usc.edu describes reporting options and other resources.

Support Systems

A number of USC’s schools provide support for students who need help with scholarly writing. Check with your advisor or program staff to find out more. Students whose primary language is not English should check with the *American Language Institute* <http://dornsife.usc.edu/ali>, which sponsors courses and workshops specifically for international graduate students. *The Office of Disability Services and Programs* http://sait.usc.edu/academicsupport/centerprograms/dsp/home_index.html provides certification for students with disabilities and helps arrange the relevant accommodations. If an officially declared emergency makes travel to campus infeasible, *USC Emergency Information* <http://emergency.usc.edu/> will provide safety and other updates, including ways in which instruction will be continued by means of blackboard, teleconferencing, and other technology.

Course Schedule: A Weekly Breakdown

Date	Lecture Topic	Reading Assignment	Lab
Jan 9	Introduction, Physiology of Exercise		Intro
Jan 11	Bioenergetics I	3	
Jan 16	Bioenergetics II	3	Locomotor Energetics
Jan 18	Exercise Metabolism	4	
Jan 23	Hormonal Responses to Exercise I	5	Hormonal Response
Jan 25	Hormonal Responses to Exercise II	5	
Jan 30	Nervous System	7	Stretch Reflex
Feb 1	Musculoskeletal System I	8	
Feb 6	Musculoskeletal System II	8	Muscle Stimulation
Feb 8	Circulatory System	9	
Feb 13	Respiratory System	10	Blood Pressure
Feb 15	Acid/Base & Temperature Regulation	11-12	
Feb 20	Physiology of Training/Review	13	Pulmonary Function
Feb 22	MIDTERM 1		
Feb 27	Cause-Effect, Motion Analysis		Motion Analysis
Mar 1	Linear Kinematics		
Mar 6	Linear Kinematics		Kinematics
Mar 8	Angular Kinematics		
Mar 11-18	SPRING BREAK		No Lab
Mar 20	Linear Kinetics ($F=ma$)		$F=ma$
Mar 22	Linear Kinetics ($F=ma$)		
Mar 27	Linear Impulse		Project Meetings
Mar 29	Projectile Motion		
Apr 3	Projectile Motion		Project
Apr 5	Angular Kinetics		
Apr 10	Joint Kinetics		Project
Apr 12	Joint Kinetics		
Apr 17	MIDTERM 2		Project
Apr 19	Real World Examples		
Apr 24	Real World Examples		Project Presentations
Apr 26	Review		
Apr 28- May 1	STUDY DAYS		
	FINAL EXAM: see schedule of classes		