Syllabus for BIOE100-01: Physiology for Engineers

Spring 2019
Instructor: Ariel Escobar

Designation:	
Catalog Description:	Catalog Description: Using the conceptual and analytical models used in engineering the student will get quantitative insights into physiological systems. Transport mechanisms, energy transduction control systems. Every system in the human body (CNS, Cardiovascular, Gastrointestinal, etc) will be explored from the tissue to the cell to the molecule.
Text Books and Other Required Materials:	Highly Recommended Materials: Medical Physiology. Boron W and Boulpaep, Saunders; 2nd edition (December 1, 2011). ISBN-10: 1437717535. Foundations of Cellular Neurophysiology. Johnstons D & Wu S
Course Objectives/ Student Learning Outcomes:	1. Become familiar with anatomical structures and physiologic functions of major organ systems. 2. Understand homeostatic processes and integration of human organ systems. 3. Develop quantitative skills for analyzing physiologic processes.
Program Learning Outcomes:	
Prerequisites by Topic:	Prerequisites by Topic: BIOE 135, BIO 2, BIOE 130, ENG 65 or BIOE 65.
Course Policies:	Course Policies: Exam Policies 1. All exams are closed book. 2. All the students must stay in the classroom until the full completion of the exam. 3. No cell phones, tablets, computers or any electronic device can be used during the exam. 4. Missed exams will result in a 0. The only exceptions are a documented medical condition or death/serious illness of family member (requires confirmation through Dean of Students). A make-up exam will be given in these cases. No make-up quizzes will be given. Classroom Policies 1. No Food is allowed in the classroom. 2. No texting with any kind of device. 3. The wifi of the computers or any electronic devices must be off. 4. Turn off all cell phones during class time.
Academic Dishonesty Statement:	a. Each student in this course is expected to abide by the University of California, Merced's Academic Honesty Policy. Any work submitted by a student in this course for academic credit will be the student's own work. b. You are encouraged to study together and to discuss information and concepts covered in lecture and the sections with other students. You can give "consulting" help to or receive "consulting" help from such students. However, this permissible cooperation should never involve one student having possession of a copy of all or part of work done by someone else, in the form of an e mail, an e mail attachment file, a diskette, or a hard copy. Should copying occur, both the student who copied work from another student and the student who gave material to be copied will both automatically receive a zero for the assignment. Penalty for violation of this Policy can also be extended to include failure of the course and

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	University disciplinary action. c. During examinations, you must do your own work. Talking or discussion is not permitted during the examinations, nor may you compare papers, copy from others, or collaborate in any way. Any collaborative behavior during the examinations will result in failure of the exam, and may lead to failure of the course and University disciplinary action.
Disability Statement:	Accommodations for Students with Disabilities: The University of California Merced is committed to ensuring equal academic opportunities and inclusion for students with disabilities based on the principles of independent living, accessible universal design and diversity. I am available to discuss appropriate academic accommodations that may be required for student with disabilities. Requests for academic accommodations are to be made during the first three weeks of the semester, except for unusual circumstances. Students are encouraged to register with Disability Services Center to verify their eligibility for appropriate accommodations.
Topics:	General Physiology Physiology overview. What is physiology? Diffusion. Transport. Resting membrane potential. Ionic channels. Action potential. Muscle Physiology. Synaptic transmission. Post Synaptic potentials. Muscle structure. Muscle mechanics. Excitation-Contraction Coupling. Skeletal muscle. Cardiac muscle. Smooth muscle. Neurophysiology Structure and function of the central nervous system (CNS). Olfactory and taste physiology. Vision Physiology. Auditory Physiology. Sensorial Somatic physiology. Autonomous nervous system. Cardiac Physiology. The heart as a pump. Cardiac electrophysiology. Electrocardiography. Autonomous regulation. Hemodynamics. Circulation. Microcirculation. Special circulation. Pulmonary Physiology Gastrointestinal Physiology GI regulation. Motility. Secretion. Salivary Gland. The stomach. Digestion. Hepatobiliary function. Exocrine pancreas. Absorption. The intestine. Endocrine Physiology Hormone -cell interaction. Pituitary and fluid homeostasis. Thyroid function. Pancreatic physiology. Insulin glucose regulation. The adrenal gland. Ca and phosphate regulation.
Class/laboratory Schedule:	Tuesday 6:00 pm - 7:15 pm Thursday 6:00 pm - 7:15 pm Friday 3:00 pm - 6:00 pm Office hours: Friday 1:00 pm - 2:00 pm
Midterm/Final Exam Schedule:	
Course Calendar:	
Professional Component:	
Assessment/Grading Policy:	100% Lecture 45 points: Exam I 45 points: Exam II 10 points Lab work
Coordinator:	Ariel L Escobar
Contact Information:	Contact Information: Ariel L. Escobar, Ph.D. E-mail: aescobar4@ucmerced
Office Hours:	Friday 1:00 pm - 2:00 pm