

ENGR 3720 ENGINEERING PHYSIOLOGY

Fall 2008; 2:00 PM - 3:15 PM TR

Room 305

Instructor

Dr. William Kisaalita (2-0835, williamk@enr.uga.edu)

UGA Bulletin Course Description

Physical features and engineering principles governing the principal body coordinating and integrating systems (circulatory, endocrine and nervous systems) are discussed.

Offered	Credits	Level	Weekly Meetings
Fall	3	Junior	Two 75-minute classes

Course Prerequisite or Co-requisite

ENGR 2170; ENGR 3160; ENGR 3520

Pre- or Co-requisite by Topic

N/A

Courses that Require this Course as a Prerequisite

N/A

Text

None

Reference Material

Course package to be provided by the instructor

Method of Grading

Homework and labs	10%
Quizzes	40%
Group Project	20%
Final	30%
<u>Total</u>	<u>100%</u>

Final grade will be based on the following scale: > 95.5 (A); 90.5-95.4 (A⁻); 85.5-90.4 (B⁺); 80.5-85.4 (B); 75.5-80.4 (B⁻); 70.5-75.4 (C⁺); 65.5-70.4 (C); 60.5-65.4 (C⁻); 55.5-60.4 (D); < 55.5 (F).

Course Learning Objectives

Course Learning Objective	Course Assessment Method*	Extent of Coverage of Program Outcomes (ABET Criterion 3)
Upon successful completion of this course, students should be able to:		
1. Combine knowledge of math and physiology to quantitatively describe physiological systems.	A, B, C	a-extensive
2. Use simulation software such as STELLA to model the normal and diseased function of physiological systems.	A, D	k-moderate, d-some, e-some
3. Design and conduct experiments, physical or in silica, and analyze and interpret results.	D, E	b-extensive, c-some
4. Appreciate the complexity and interconnectedness of physiological systems.	D, E	e-moderate h-some, j-some
5. Communicate effectively.	G	g-moderate
6. Understand the importance of the relationships between science, technology, and society, local and global.	E	h-some, c-moderate, i-extensive, f-moderate

* Course Assessment Methods: A – Homework; B – Hourly Exams; C – Final Exam; D – Computer-based Project; E – Laboratory-based Project; F – Student Evaluation; G – Class Presentations.

ABET EC-2000 Criterion 3 Program Outcomes

- (a) an ability to apply knowledge of mathematics, science, and engineering
- (b) an ability to design and conduct experiments, as well as to analyze and interpret data
- (c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
- (d) an ability to function on multidisciplinary teams
- (e) an ability to identify, formulate, and solve engineering problems
- (f) an understanding of professional and ethical responsibility
- (g) an ability to communicate effectively
- (h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
- (i) a recognition of the need for, and an ability to engage in life-long learning
- (j) a knowledge of contemporary issues
- (k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

verall Course Contribution to Program Outcomes

With the exception of item f, all other outcomes are addressed by the course to a varying degree.

- a-extensive
- b-extensive
- c-some
- d-some
- e-moderate
- f-moderate
- g-moderate
- h-some
- i-extensive
- j-some
- k-moderate

Schedule

<u>Week</u>	<u>Date</u>	<u>Day</u>	<u>Topic</u>	<u>Ch.</u>
1	Aug 19	T	Introduction	
2	Aug 21	R	Physiological modeling	1
	Aug 26	T	Modeling with STELLA	App A
3	Aug 28	R	Homeostasis	2
	Sept 02	T	Basic feedback control	3
4	Sept 04	R	Basic feedback control [LAB I]	
	Sept 09	T	EXAM 1; Endocrine system	4
5	Sept 11	R	Endocrine system	
	Sept 16	T	Nervous system	5
6	Sept 18	R	Nervous system	
	Sept 23	T	Nervous system [WSK OUT OF TOWN]	
7	Sept 25	R	EXAM 2; Cell memb. potential [WSK OUT OF TOWN]	6
	Sept 30	T	Cell membrane potential	
8	Oct 02	R	Hodgkin-Huxley action potential model	7
	Oct 07	T	Hodgkin-Huxley action potential model [LAB II]	App B
9	Oct 09	R	Body fluids	8
	Oct 14	T	EXAM 3; Cardiovascular system circuitry	9
10	Oct 16	R	Advanced modeling with STELLA & Proj Assign	App A
	Oct 21	T	Blood – the working fluid	10
11	Oct 23	R	Blood - the working fluid	
	Oct 28	T	Cardiac cycle	11
12	Oct 30	R	Energetics of the heart	12
	Nov 04	T	Energetics of the heart	
13	Nov 06	R	Electrocardiology	13
	Nov 11	T	Electrocardiology	
14	Nov 13	R	Electrocardiology [LAB III]	
	Nov 18	T	EXAM 4; Circulation and respiration	14
15	Nov 20	R	Circulation and respiration	
	Nov 25	T	THANKSGIVING HOLIDAY	
16	Nov 27	R	THANKSGIVING HOLIDAY	
	Dec 02	T	Regulation [LAB V]	15
17	Dec 04	R	Group project presentation	
	Dec 09	T	Friday Class Schedule in Effect	
	Dec 11	R	3:30-6:30 pm FINAL EXAM	
	Dec 19	F	Grades due by 7 pm	

Academic Honesty

All students are responsible for maintaining the highest standards of honesty and integrity in every phase of their academic careers. The penalties for academic dishonesty are severe and ignorance is not an acceptable defense. The document for academic honesty may be found at the web site for The University of Georgia Office of Senior Vice President for Academic Affairs and Provost.

Attendance Policy

Five absences may result in being withdrawn from the class with a WF grade.

Departmental Grading Policy Regarding Communication

Thirty percent of the grade on all written assignments (lab reports and papers) and oral presentations will be based on quality of communication. Spelling, grammar, punctuation, and clarity of writing are evidence of written communication quality. Enunciation, voice projection, clarity and logical order of the presentation and effective use of visual aids are evidence of oral communication quality.

Engineering Professionalism Policy

Engineers make great contributions to society. Engineering is a very satisfying profession that provides many rewards but is demanding and requires hard work. The engineering profession is governed by a code of ethics. Engineering faculty at UGA expect students to act in a professional manner at all times and develop the work ethics required for a successful engineering career. Engineering students at UGA are responsible for maintaining the highest standards of professionalism and professional practice.