

Bioengineering 3202, Human Physiology II

Spring Semester, 2004

Cardiovascular Physiology

Rob MacLeod

April 24, 2004

Description

This is the revised syllabus from the section of BE 3202, Physiology II, which deals with the cardiovascular system. This material provides an overview of systems physiology with special emphasis on engineering aspects of the mechanisms involved.

This version is based on discussion in the first lecture to determine topics of common interest in the class and it will evolve as we go through the material.

Class time and venue

Class times: Monday, Wednesday, Friday: 9:40–10:30 am
Classroom: MEB 2325
Lab times: Monday and Wednesday: 2:00–5:30
Lab room: MEB 1480

Instructors

Name	Phone	Email	Office	Office Hours
Rob MacLeod	587-9511	macleod@cvrti.utah.edu	3476 MEB	After Friday classes and by appointment
Lucas Lorenzo (TA)	587-9536	lucas@cvrti.utah.edu	CVRTI	By appointment

Text and resource materials

Human Physiology: an Integrated Approach, Second Edition by D.U. Silverthorn, Prentice Hall.

See the class CV web site (www.cvrti.utah.edu/~macleod/be3202) for the most up to date information.

Learning objectives

To produce students and future engineers who:

- Have fundamental knowledge of physiological system function and dysfunction

- Can analyze physiological systems from an engineering perspective
- Have the ability to formulate practical engineering solutions to ameliorate biological disorders
- Understand how solutions manifested in biological systems may potentially be applied to the solution of traditional engineering problems through a bio-based approach
- Appreciate the ability of bioengineering to improve the quality of life
- Recognize the ethical issues associated with testing and implementation of biomedical devices and treatments
- Understand the need for life-long learning to maintain and enhance their technical skills, and to stay abreast of advances in understanding

Grading

Grading for the whole course will be based on a combination of exams and homework assignments as follows:

Exams: 2 midterms and a final exam, worth a total of 75% of the total grade. All the material from this, the cardiovascular section of the course, will be in the final exam.

Quizzes and homework assignments: assigned throughout the semester and worth a total of (25)% of the final grade

Lectures and Reading Material

#	Date	Topic	Read
CV-0	March 31	Overview and topic selection	
CV-1	April 2	Cellular electrophysiology and EC coupling basics	14:420–422
CV-2	April 5	Contraction of the heart and frog anatomy	14:415–419
Lab-1	April 5/7	Frog heart lab 1: structure and Frank Starling	
CV-3	April 7	Heart cycle	14:423–434
CV-4	April 9	Tissue electrophysiology and arrhythmias	14:428–429
CV-5	April 12	Control of heart rate/contraction	14:434–437
Lab-2	April 12/14	Frog heart lab 2: function and regulation	
CV-6	April 14	Treating arrhythmias	notes
CV-7	April 16	(Lucas) MATLAB tutorial	www.cvr.ti.utah.edu/~macleo
CV-8	April 19	Design of a Defibrillator	notes
CV-9	April 21	(Lucas) The Electrocardiogram	14:426–429
CV-10	April 23	The ECG, part II and Blood pressure, part I, regulation of cardiac output, and exercise	14:426–429, 15:443–444
CV-11	April 26	Blood pressure, part II, regulation of cardiac output, and exercise	15:448–456
Lab-3	April 26/28	ECG, Blood Pressure, and Exercise	
CV-12	April 28	Ethics in biomedical engineering	

* Chapter:page numbers from Silverthorn.