

BME 302 Human Physiology for Engineers II – Spring 2007

Dept. of Biomedical Engineering, North Carolina State University, Raleigh, NC 27695

Lectures: Tue & Th at 8:30 – 9:20, Room 158 Weaver Labs

Teaching Team: Instructor: Elizabeth Lobo egloboa@ncsu.edu (P) 919.513.4015, (F) 919.513.3814; **Teaching Assistants:** Meghan Hegarty mshegart@ncsu.edu and David Wagner dhwagner@ncsu.edu

Labs: 125A Weaver Labs.

Office hours: Contact for an appointment or drop in any time.

Textbook: Dee Unglaub Silverthorn, *Human Physiology: An Integrated Approach*, 4th edition, Pearson Education publishing as Benjamin Cummings, San Francisco, CA 2004.

Homepage: <http://vista.ncsu.edu>

Prerequisites: BME 301, BME 311, ST 370

Course objectives. In this course, students will learn the physiology of the cardiac, respiratory, renal, and musculoskeletal systems. At the conclusion of the course, students should understand the following:

- Basic Fluid and Solid Mechanics Concepts
- The Cardiovascular System
- Blood and the Vascular System
- Regulation of the Cardiovascular System
- Respiratory Anatomy
- Mechanics of Breathing
- Gas Exchange
- Gas Transport in the Blood
- Regulation of the Respiratory System
- The Kidneys
- Control of Body Fluid, Electrolyte, and Acid-Base Balance
- The Musculoskeletal System

Assessment of material. Students' knowledge of the objectives will be assessed by homework assignments, in-class exams and quizzes, a presentation, and a report.

Homework assignments	45% of final grade
Exams	30% of final grade
In class quizzes	10% of final grade
Final Exam	15% of final grade

Tentative Course Schedule

Lecture	Date	Topic	Lab Experiment
1	Jan 11	Introduction to course	No lab
2	Jan 16	Handout: Fluid Mechanics	
3	Jan 18	Handout: Fluid Mechanics	Tubular Flow
4	Jan 23	Handout: Fluid Mechanics	
5	Jan 25	Chap. 14 Cardiovascular Phys	Vessel Distensibility
6	Jan 30	Chap. 14 Cardiovascular Phys	
7	Feb 1	Chap. 15 Blood Flow	Rheology
8	Feb 6	Chap. 15 Blood Flow	
9	Feb 8	Review	No lab
10	Feb 13	Exam 1	
11	Feb 15	Chap. 16 Blood	Blood pressure
12	Feb 20	Chap. 16 Blood	
13	Feb 22	Chap. 17 Mech Breathing	Spirometer
14	Feb 27	Chap. 17 Mech. Breathing	
15	Mar 1	Chap. 18 Gas Exchange	Hollow fiber
16		<i>Spring break Mar 5-9</i>	
	Mar 13	Chap 18 Gas Exchange	
17	Mar 15	Review	No lab
18	Mar 20	Exam 2	
19	Mar 22	Chap. 19 The Kidneys	Kidney dissection
20	Mar 27	Chap. 19 The Kidneys	
21	Mar 29	Chap. 20 Electrolyte Balance	Dialysis
22	Apr 3	Chap. 20 Electrolyte Balance	
23	Apr 5	Chap. 12 Muscle	
		<i>Spring holiday Apr 6</i>	No lab
24	Apr 10	Chap. 12 Muscle	
25	Apr 12	Review	No lab
26	Apr 17	Exam 3	
27	Apr 19	Handout: Solid Mechanics	Muscle Mechanics Lab
28	Apr 24	Handout: Solid Mechanics	
29	Apr 26	Handout: Solid Mechanics	Cartilage Lab

POLICIES AND PROCEDURES

Grades. Final grades will be based on the following scale:

100–97	A+	90–87	B+	80–77	C+	70–67	D+	<60	F
97–92	A	87–82	B	77–72	C	67–62	D		
92–90	A-	82–80	B-	72–70	C-	62–60	D-		

Academic integrity. Students are expected to adhere to the guidelines for academic integrity outlined in the NCSU Code of Student Conduct:

http://www.ncsu.edu/policies/student_services/student_discipline/POL11.35.1.php

Cases of misconduct will be addressed according to the procedures outlined in the Code. Your signature on any submitted work implies that you have neither given nor received unauthorized aid.

Student disabilities. Reasonable accommodations will be made for students with verifiable disabilities. In order to take advantage of available accommodations, students must register with Disability Services for Students at 1900 Student Health Center, Campus Box 7509, 515-7653 (http://www.ncsu.edu/provost/offices/affirm_action/dss/). For more information on NC State’s policy on working with students with disabilities, please see the Academic Accommodations for Students with Disabilities Regulation:

http://www.ncsu.edu/policies/academic_affairs/courses_undergrad/REG02.20.1.php

Attendance. Students are expected to attend all classes. Read the NCSU attendance policy (http://www.ncsu.edu/policies/academic_affairs/pols_regs/REG205.00.4.php) for definitions of excused absences. If you anticipate an excused absence on a due date, please contact Dr. Loba to make other arrangements.

Homework assignments. Students will have approximately one week to complete each homework assignment. Due dates will be written on the assignment handouts. Homework is to be completed individually. If you have questions regarding the assignments, ask an instructor either via email or during a scheduled appointment.

Homework format: Include your name and homework number on each page. Also include page numbers on each page in the format “X of Y” where X is the current page and Y is the total number of pages.

Late assignments. Late assignments and reports without a valid excuse (see Attendance above) will receive a zero.

Quizzes. Quizzes will be announced at least one class period in advance.