

BMME 790
Systems Physiology for Biomedical Engineers
Course Syllabus

1. *Department:* Joint Dept. of Biom. Engr. *Number:* BMME 790 *Credit Hours:* 3
Title: Systems Physiology for Biomedical Engineers *Required*

2. *Course Description:*

A graduate-level introduction to systems and organ physiology. The course is the second of a two semester series in which topics covered will include membrane structure and physiology, muscle physiology, central and peripheral nervous systems, cardiac electrophysiology, renal physiology, respiratory physiology, gastrointestinal physiology and endocrinology.

3. *Prerequisite(s):* BMME 181.

4. *Textbook(s) and/or other required material:*

Principles of Neural Science, 4th edition. Kandel, Schwartz and Jessel, eds.
Textbook of Medical Physiology, 11th edition. Guyton and Hall, eds.

5. *Course objectives. By the end of this course, the student should be able to:*

1. Have a basic understanding of the following physiological systems:
 - a) cardiovascular
 - b) respiratory
 - c) renal
 - d) endocrine
2. Design basic experiments that test fundamental hypotheses about the various physiological systems.
3. Be able to critically read contemporary scientific literature on a wide range of topics that investigate certain aspects of the studied systems.

6. *Topics covered (number of lectures per topic, based on 38 50-minute lectures per semester):*

1. Cardiac anatomy and function (2)
2. ECG interpretation (2)
3. Control of blood flow, cardiac output, cardiac failure (4)
4. Functional organization of kidney and body fluids (3)
5. Regulations of fluids, electrolytes and acid-base balance (5)
6. Diseases of the kidney and the heart (3)
7. Respiration, gas exchange, pulmonary circulation (7)
8. Energetics and metabolism (2)
9. Endocrinology and reproduction (8)
10. Disorders of the endocrine system (2)

7. *Class/laboratory schedule (sessions per week and duration of each session):*

Three 50-minute lectures plus one two hour recitation per week

Date of preparation and person(s) who prepared this description:

M. Tommerdahl, October 20, 2005