TO: The Engineering Faculty
FROM: Department of Biomedical Engineering
RE: New Graduate-Level Course

The Department of Biomedical Engineering has approved the following new course. Approval of the Faculty of the Schools of Engineering is requested.

BME 522 Problems in Measurement of Physiological Events

A. Course Description

Sem. 2. Class 2, Lab 4, cr. 4.

Prerequisites: Consent of instructor

Lectures devoted to the methods used to measure physiological events with demonstrations and laboratory exercises to emphasize the practical aspects of quantitative measurements on living subjects. The systems covered are cardiovascular, respiratory, and central peripheral nervous.

B. Reason: This course has been offered twice with an experimental number within the BME department and has been previously offered from the School of Electrical and Computer Engineering as ECE 522 for more than 10 years.

This is BME's only laboratory course on the fundamentals of measurement principles for physiological events. The contents are applicable to a broad class of biomedical measurements systems, at several levels (molecular, cellular, and systems).

The course was offered in Spring 2001, Spring 2002 and Spring 2003 with 16, 13, and 15 students respectively. Spring 2001 had 15 undergraduate students and 1 graduate student, Spring 2002 has 8 undergraduate students and 5 graduate students and Spring 2003 has 11 undergraduate students and 4 graduate students.

George R. Wodicka
Head and Professor
Department of Biomedical Engineering

Supporting Documentation:

Course Instructor: Ann Rundell

Offered: Spring Semester

Course Objective: A student who successfully fulfills the course requirements will have demonstrated an understanding of the criteria for faithful reproduction of physiological events, an ability to conduct experiments in the laboratory to obtain, observe, and report physiological events, an understanding of the cardiovascular system in terms of the cardiac muscle, electrical signals, cycle and output, an ability to utilize bioelectrodes for stimulation and recording purposes, and an understanding of the mechanism of information communication employed by the nervous system.

Student Population: The course is designed to be dual level for graduate students and advanced undergraduates interested in biomedical engineering.

Course Content:
Syllabus

Topics	Lecture	Lab(4hr)
Criteria for the Faithful Reproduction of Physiological Events (Analog and Digital)	3	1
Bandwidth of Bioinstrumentation systems and Frequency Content of Signals	2	1
Bioelectric Amplifiers	1	1
Properties of Bioelectrodes	1	2
Stimulation of Excitable Tissue	2	1
Nerve Propagation	2	1
Origin of ECG	1	1
Properties of the Cardiac Muscle	2	1
The Cardiac Cycle	2	1/3
Cardiac Output	1	1/3
Pacing, Fibrillation, Defibrillation, ICDs	3	1
Measurement and Regulation of Blood Pressure	2	1
Anesthesia	1	1/3
Pulmonary System	2	1
Electrical Safety	1	
Total	26	13

Remaining hours are used for examinations and record review and analysis

Text(s): L.A. Geddes and L.E. Baker, Principles of Applied Biomedical Instrumentation, John Wiley, 3rd Edition, 1989. ISBN (0-471-60899-8