BME1 INTRODUCTION TO BIOMEDICAL ENGINEERING
(Required for BME and BMEP)

Catalog Data: **BME1 Introduction to Biomedical Engineering (Credit Units: 3)** Introduction to the central topics of biomedical engineering. Offers a perspective on bioengineering as a discipline in a seminar format. Principles of problem definition, team design, engineering inventiveness, information access, communication, ethics, and social responsibility are emphasized. (Design units: 1)

Textbook: *Introduction to Biomedical Engineering*, John Enderle (ed.), Academic Press, 1999. (Recommended not required.)
Charting the Milestones of Biomedical Engineering EMBS History Booklet

References: Research Articles from BME faculty. Class Notes

Course Coordinator: Tibor Juhasz

Relationship to Program Outcomes: This course relates to the Program Outcomes:
BME: d, e, f, g, and j as stated at:
http://undergraduate.eng.uci.edu/degreeprograms/biomedical/mission

Course Outcomes / Performance Criteria: Students will:
Define the discipline of Biomedical Engineering. (BME j)
Describe the scope of research in the Department of Biomedical Engineering. (BME j)
Complete a problem based design project of interest. (BME d, e)
Perform a literature search and present the findings. (BME g, j)
Present sketches or graphics and explain design objectives, principles and expectations. (BME d, g)
Discuss difficulties, feasibility, time required for completion and any possible ethical questions. (BME f)

Prerequisites By Topic:

Lecture Topics: Introduction to Biomedical Engineering.
Biomedical Microsystems and nanotransducers.
Biomedical computation.
Biomedical photonics.
Molecular, cellular, and tissue Engineering.
On ethical issues, government and university regulation.
On quality of products and research; reliability of products.
Discussion of design problems.

Class Schedule: Meets for 3 hours of lecture each week for 10 weeks.

Computer Usage: Basic computer. Design graphics may be necessary.

Laboratory Projects:

Professional Component: Contributes toward the Biomedical Engineering Topics and Major Design experience.

Design Content Description

Approach: The students will describe a biomedical engineering research project that they would like to carry out. This can be an invention of an instrument for scientific inquiries, or a device for clinical application or a gadget for home care, or any other things that would qualify as Biomedical Engineering. Or it can be a study of a scientific or technological problem concerning a phenomenon of interest to biomedical engineering. (50%)
Discussion of the phases of design (need, definition of the problem, synthesis, analysis, optimization, evaluation, presentation). Consideration of design solutions, concepts, concepts selection detailed deign and design validation. Consideration of design tools (software, instrumentation, devices). Design parameters and error analysis under various initial and boundary conditions. (50%)
Lectures: 100%
Laboratory Portion: 0%

Grading Criteria:		%Engr. Sci.	%Engr. Design	%Total
Lectures:	Questions on Noteboard	9		9
	Individual Lecture Report	15		15
	Midterm	8		8
	Final	8		8
Project:	Individual Task Report	5	10	15
	Final Report	20	20	40
		65%	30%	95%
Bonus:	Online Evaluations/ad hoc tasks			5%
				100%

Estimated ABET Category Content:

Mathematics and Basic Science: 0 credit units or 0%
Engineering Science: 2 credit units or 67%
Engineering Design: 1 credit units or 33%

Prepared by: Tibor Juhsaz **Date:** July 2008

CEP Approved: Fall 2006