Course Description

EE 4385 Biomedical Instrumentation

2000-2002 Catalog Data: An introduction to basic concepts in biomedical instrumentation, blood flow measurements, bio potential amplifiers as well as electrical safety. Prerequisites: EE 3340 with a grade of “C” or better.

Prerequisite by Topic:
1. Electronics
2. Physics


Course Outcomes: Students Completing EE 4385 will be able to:
1. Design a simple ECG monitor.
2. Understand the principles of operation of medical instrumentation.
3. Understand the principles of operation of ultrasound.
4. Determine the parameters associated with medical instrumentation.

Topics Covered:
1. General instrumentation concept (7 hrs)
2. Concepts of muscle contraction and cell concept (5 hrs)
3. Heart anatomy (3 hrs)
4. ECG instrumentation (3 hrs)
5. Blood pressure measurements (4 hrs)
6. Ultrasound measurements (3 hrs)
7. Brain and EEG (10 hrs)
8. Electrical safety (6 hrs)

Class Schedule: Three hours lecture per week.

Contribution to Professional Component:

EE 4385 is a senior elective course which builds on topics covered primarily in junior required courses. It is one of a group of courses normally taken by students seeking a specialization in Biomedical Instrumentation. It may also be taken as an elective by students seeking additional breadth in their curriculum.

Relationship to Program Outcomes:

1. Have an ability to apply knowledge of mathematics, science and engineering.
Students use concepts from calculus in the analysis and design of instrumentation. (Course Outcomes 2 and 3)

3. Have an ability to design a system or component to meet desired needs.

Students have homework problems that incorporate design issues. (Course Outcomes 1 and 4)

5. Have and ability to identify, formulate and solve engineering problems.

Students are able to hone these skills while working homework problems and performing design calculations. (Course Outcomes 1 and 4)

7. Have and ability to communicate affectivity.

Students write a critique of a technical paper dealing with some aspect of Biomedical Instrumentation. (Course Outcome 2 and 3)

Course Outcomes do not relate to Program Outcomes 2,4,6,8-11. They do not correlate strongly with Educational Objective 2 (30%).

Prepared by: Samir Manoli, Associate Professor of ECE