BE511 Class Syllabus and Schedule - Spring, 2015
Biomedical Instrumentation

Instructor: Prof. Darren Roblyer
Office: ERB231
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Office Hours: by appointment

GTF: Hannah Peterson
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Office Hours: by appointment

Lecture: Tues and Thurs 10am-12 pm
Lab: Tues 12-3 pm ERA 209

Course Website: On BU’s blackboard Learn https://lms.bu.edu

Textbook: None, we will use powerpoints and pdf’s posted throughout the semester

References:
2. The Art of Electronics by Horowitz and Hill

Grading:
Lab Reports, Homeworks, Projects 65%
Midterm Exam 15%
Final Exam 15%
Participation 5%

Course Prerequisites:
ENG BE 491 (Engineering Physiology Labs) and ENG BE 402 (Control Systems in Biomedical Engineering)

Course Description:
This course is an introduction to biomedical instrument design. We will introduce physiological signals, biomedical sensors, analog signal amplification and filters, digital acquisition, digital filtering and processing, and an overview of several common medical instrumentation platforms. Hands-on implementation of key principles of instrumentation design will be covered in the laboratory portion of the class culminating with students designing and fabricating their own, stand-alone pulse oximeter.

Course Goals: Students will understand the major design considerations in biomedical instrumentation. Students will understand the range and capabilities of the most common
sensors, conditioning, processing, and analysis methods needed to design and fabricate biomedical instrumentation. Students will achieve proficiency in hands-on analog circuit design and implementation as well as practical methods for signal digitization, digital signal processing, and instrument programming. Students will design, build, and characterize a complete biomedical instrument and justify their design choices.

**Class and Laboratory Policies:** All students must attend lab sessions. Students will be assigned to groups of 2-3 for the laboratory sections of the course. In addition to the lab, there will be several homework-like problems in each lab assignment that will help to prepare for the next lab. Each group will submit one laboratory report, typically due the Tuesday following their laboratory session. **Each student should submit their own homework solutions.** Late assignments will be given a zero. There will be no exceptions. Any special circumstances must be discussed with me prior to the due date. Groups are encouraged to collaborate and discuss problems, but each group will be required to turn in their own original work and each student must submit separate homework. Assignments determined to be copied from other class members will be given a zero and students may be subject to more serious disciplinary action per the discretion of the instructor and TA.

Grades will be available throughout the semester on the Blackboard Learn site. These posted grades do not necessarily reflect your final course grades as adjustments/curving will likely be applied.