

COLLEGE OF CHEMISTRY COURSE GUIDE (../INDEX.HTML)

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BIOE 101 - INSTRUMENTATION IN BIOLOGY AND MEDICINE (4 UNITS)

(Taken from the UC Berkeley Course Guide (<http://guide.berkeley.edu>))

COURSE OVERVIEW

SUMMARY

This course teaches the fundamental principles underlying modern sensing and control instrumentation used in biology and medicine. The course takes an integrative analytic and hands-on approach to measurement theory and practice by presenting and analyzing example instruments currently used for biology and medical research, including EEG, ECG, pulsed oximeters, Complete Blood Count (CBC), etc.

PREREQUISITES

EE 16A ([ee16a.html](#)), EE 16B ([ee16b.html](#)), MATH 53 ([math53.html](#)), MATH 54 ([math54.html](#)), PHYS 7A ([phys7a.html](#)), PHYS 7B ([phys7b.html](#)), or consent of instructor
Spring only

TOPICS COVERED

Students should understand the architecture and design principles of modern biomedical sensor data-acquisition (sensor-DAQ) systems. They should understand how to choose the appropriate biomedical sensor, instrumentation amplifier, number of bits, sampling rate, anti-aliasing filter, and DAQ system. They will learn how to design a low-noise

instrumentation amplifier circuit. They should understand the crucial importance of suppressing 60 Hz and other interferences to acquire high quality low-level biomedical signals. They should understand the design principles of building, debugging.

Students will achieve knowledge and skills in biomedical signal acquisition. They will be assessed in their success with the Course Objectives through tests, homeworks, and laboratories. In particular, the tests will ensure that the students have absorbed the theoretical concepts. The laboratories will provide assessment of learning practical skills (e.g., building an ECG circuit).

WORKLOAD

COURSEWORK

TIME COMMITMENT

3 hours of lecture and 3 hours of laboratory per week.

UC Berkeley Course Guide (<http://guide.berkeley.edu>)

COLLEGE OF CHEMISTRY PEER SERVICES

Made by Angela Lee, c/o 2019



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