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

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## MECHE 102B - MECHATRONICS DESIGN (4 UNITS)

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

## COURSE OVERVIEW

#### SUMMARY

Introduction to design and realization of mechatronics systems. Micro computer architectures. Basic computer IO devices. Embedded microprocessor systems and control, IO programming such as analogue to digital converters, PWM, serial and parallel outputs. Electrical components such as power supplies, operational amplifiers, transformers and filters. Shielding and grounding. Design of electric, hydraulic and pneumatic actuators. Design of sensors. Design of power transmission systems. Kinematics and dynamics of robotics devices. Basic feedback design to create robustness and performance.

#### PREREQUISITES

E 25, E 26 (junior transfers students are exempt from this requirement), E 27, as well as EE 16A or EE 40

#### TOPICS COVERED

Introduce students to design and design techniques of mechatronics systems; provide guidelines to and experience with design of variety of sensors and actuators; design experience in programming microcomputers and various IO devices; exposure to and design experience in synthesis of mechanical power transfer components; understanding the role of dynamics and kinematics of robotic devices in design of mechatronics systems; exposure to and design experience in synthesis of feedback systems; provide experience in working in a team to design a prototype mechatronics device.

By the end of this course, students should: Know how to set up micro computers and interface them with various devices; know how to understand the microcomputers architectures, IO devices and be able to program them effectively; understand the design of actuators and sensors; know how to do shielding and grounding for various mechatronics projects, know how to create feedback systems, know the role of dynamics and kinematics of robotic devices in design and control of mechatronics systems; know how to design mechanical components such as transmissions, bearings, shafts, and fasteners.

### WORKLOAD

#### TIME COMMITMENT

2 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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