UC Berkeley

Mechanical Engineering Department

ME135/ME235

Design of Microprocessor-Based Mechanical Systems

Lecturer:	George Anwar	
Classroom:	105 Northgate Hall MW 5:00 – 6:30 PM	
Office:	120 Hesse Hall or 5106 Etcheverry Hall	
Office Hrs:	TBD, by appointment, or at any time he is seen	
Lab Space:	120 Hesse Hall	
GSI:	Drew Sabelhaus	apsabelhaus@berkeley.edu

Overview

- Introduction to Real-time Programming
- Task and State design methodology
- Introduction to LabVIEW 2018
- Introduction to PSOC 5LP
- Introduction to C
- Real-time implementation issues
- Multitasking capabilities in software
- Driving Steppers, DC, and RC Servo Motors
- Interfacing to Digital and Analog Sensors
- Feedback control basics
- Human Machine interface
- The World is not all Arduino

Course Objectives

- Assess the relative difficulty of a problem
- Outline a solution to it
- Estimate the resources to solve the problem
- Develop and document a design
- Implement a prototype solution
- Test and evaluate the solution
- Work as part of a team
- Time management

Your Objectives

- Get an A in the class (obviously), maybe A+
- Maybe learn LabVIEW, or at least know what it is
- Understand the concepts of Real-time and Multitasking
- Time management
- Respect what it takes to get a project done
- Work as part of the team, get to know your team
  (at least know your team member's name)
- Be able to jugde what is good enough
- Create a project worthy to talk about on your Resume and interviews
- Make it on the course Hall of Fame or Shame
- Be on either fringe, try to be away from the norm. (Differentiate yourself)
- Pass the CLAD exam

CLAD Exam:

- **Certified LabVIEW Associate Developer**
- **Exam Format: Multiple choice**
  Exam Duration: One-hour duration

Basis for Grading

9 Lab Exercises	30%
Final project proposal	10%
Weekly Progress reports/Journal	5 %
Midterm milestone presentation	10%
CLAD exam	5%*
Final project presentation (RRR week)	40%

* 5% if pass first time, 3% if pass second time

Final Project

- Group Effort (3-4 members optimal)
- Demonstrate the use of real time software
- Design and development of Host GUI software
- Components running on multiple CPU's or Cores
- Interaction with the external world through sensors, actuators, or other computing units
- Must be multitasking and real time