CS/ECE 5780/6780: Embedded System Design

John Regehr

Lecture 0: Course Overview
Course web site: http://www.eng.utah.edu/~cs5780/
Send questions to: teach-cs5780@list.eng.utah.edu
Course mailing list: cs5780@list.eng.utah.edu
Lectures: T, H 12:25-1:45pm in WEB 1250.
John’s office: MEB 3470
TA: Rohit Pagariya
Lab: MEB 2265 (ECE Digital Lab)
Introduction to issues in embedded system design using microcontrollers.

Topics include:

- Microcontroller architecture,
- Embedded software design,
- Interrupt synchronization,
- Timing generation and measurement,
- Serial and parallel I/O interfacing, and
- Analog interfacing.
You are expected to have knowledge of the following subjects:

- Programming in C (i.e., CS 1000, CS 2000, or CS 4400)
- Data structures in C (queues, stacks, and linked lists)
- Microcomputer programming (i.e., assembly language programming)
- Digital logic (binary arithmetic, multiplexers, tri-state logic, finite state machines, etc.)
- Test equipment like multi-meters and oscilloscopes
- Discrete analog electrical circuits (resistors, capacitors, inductors, and transistors)
Title: *Embedded Microcomputer Systems: Real Time Interfacing*, 2nd Edition
Author: Jonathan W. Valvano
ISBN-10: 0-534-55162-9
Should be available in the bookstore.
Microcontroller, project board, and code development environment documentation are available via the course website.
CS/ECE 5780:
- Lab reports - 40 percent
- Midterms - 30 percent
- Final - 30 percent

CS/ECE 6780:
- Lab reports - 20 percent
- Midterms - 30 percent
- Final - 30 percent
- Project - 20 percent

More information regarding the 6780 student projects will be given later.
The lab is staffed from 7:30 a.m. to 6:00 p.m
24/7 card key access is also available
Go to MEB 2355 to get access
We’ll work on lab times on Thursday
Labs can be completed in teams of two.
6780 students must work with other 6780 students.
PBMCUSLK: Microcontroller Project Board

- Breadboard
- 60-pin MCU connector
- USB BDM pod
- LCD Module
- COM Port
- 8 DIP Switches
- 5kΩ potentiometer
- 8 green LEDs
- 8 push buttons
- Buzzer
16-Bit HCS12C32 Student Learning Kit

MC9S12C32 MCU
- 32K Byte Flash
- EEPROM
- 2K Bytes RAM
- 31 I/O lines
- 8-Ch 16-bit Timers
- SCI/SPI Ports
- CAN 2.0 Module
- 8-Ch 10-bit ADCs
- 8MHz Internal Bus
- 25MHz Operation

40 pin connector
RS-232 Serial Port
3 push buttons (2 user/reset)
3 LEDs (2 user/VDD)
Microcontroller Kit Checkout Policy

Each partnership receives one Microcontroller Project Board and HCS12C32 module.
Both parties must be present to checkout the kit and sign the loan agreement form.
These kits also include software, cables, wires, docs, etc.
The entire contents of the kit must be returned **CLEAN, COMPLETE, AND IN WORKING CONDITION** before the last day of class.
You are responsible for up to $250 for loss or damage.
Labs and Lab Reports

Labs begin next week or the week after
Prelab checked at the beginning of your lab section.
Working lab should be checked off during your lab section.
Lab reports due to TA at beginning of your next lab section.
Only one prelab and report per team is required.
Put your lab section number on all lab reports.
There is NO provision for turning in late lab reports.
Lab reports will be returned in your next lab section.
If you have a question regarding your grade, please contact
the grader for that assignment to address the issue.
All labs reports and exams are assumed to be correctly graded
one week after they are returned.
After the one week has lapsed, no changes will be considered.
Use of Email

I expect all students to be on the class mailing list
Don’t mail the class mailing list unless you want everyone to get it
Mail about the class should go to the teach-cs5780 address
Include your full name in any email
We prefer to get mail from University accounts
Don’t send big attachments