**262 Schedule**

**1/24-Fri Lec1/2:** Intro, Syllabus, Adds/Roll, Microcontroller vs General-Purpose Microprocessor., Number Systems, Positional Weighting, Inside a Computing System (8051 MCU Slides)
**Lab1/2:** What is an Embedded System, Lab Supplies w/ Soldering Video, uVision IDE
**All Lab Supplies are needed by Lec/Lab5/6. We will have a soldering workshop during Lec-Lab5/6. You are welcomed to bring your own soldering iron if you have one, otherwise I have soldering supplies. Always Bring Laptop to Every Lab, uVision IDE should be installed by Lec-Lab3/4**

**1/31-Fri Lec3/4:** Anatomy of a C Program, 8051 Program Execution with 1st Example Simulation, Data Types, Comments, Intro to FOR-Loops, Hard-Coded Delays and Busy-Wait, Quiz34 (What is an embedded System, MCU vs CPU?), Quiz - Define Embedded System & CPU vs MCU

**Lab:** 8051 Ports and Port Output, Voltages and Logic Levels, Special Function Registers, 8-bit Registers, Start Lab 1 - Simulating 8051 Port I/O
**Lab 1 is due by beginning of next class in Canvas.**

**2/07-Fri Lec5/6:**
**Activity: Soldering Workshop (Have All Supplies),** Soldering Safety & Safety Quiz **Lecture:** Programming Test Code and Verifying Development Board. **Lab:** Transition to Development Board. Run Test Code and attempt changes to see effect.

**2/14-Fri Lec7/8:
Activity:** Breadboarding 8 LEDs, Quiz – Number Systems
**Lecture:** Internal Port-Output Circuit, LED – Light Emitting Diodes and LED Interfacing, Sourcing/Sinking Current (Sink > Source), Shift Operators (Shift Left/Right)
**Lab: Start Lab 2:** Start Programming, Problem Solving and Development Methodology

**2/21-Fri Lec9/10:** Bit-Wise AND Operator, IF Statements, Bit-Masking, Port-Input, Internal Port-Input Circuit, Pushbutton/Switch Circuit Topology **Lab: Continue Lab 2: Add Pushbutton and decision logic for scroll speed adjustment
Lab 2 is due by beginning of next class in Canvas.**

**2/28-Fri: Lect13/14:** Bit Manipulations, Set/Clr Bit**,** MCU Minimum Connections, Reset Conditions, Clock Sources **Lab13/14: Start Lab 3: Adding External Pattern Change Button and Taking 2 Waveform Captures of the LED On Timing with the Oscilloscope. Note: The speed change and Pattern Change on button press should be able to be recognized and updated during the middle of the shifting.**

**3/07-Fri:** Timer Peripheral **–** 16Bit Mode, Incrementing Sources, Reg: TMOD, TCON**,** Timer Flags**,** TH:TL and calculating load value **Lab: Lab 3 Cont… Lab 3 is due by Due by beginning of next class in Canvas. Note that as well as the lab write-up being completed, including the 2 waveform captures with measurements as discussed during class. You should also upload a short video showing the a full left to right and right to left cycle at both speeds. The speed change and Pattern Change on button press should be able to be recognized and updated during the middle of the shifting.**

**3/14-Fri: Midterm 1
Lab: Start Lab 4**

**4/11-Fri:** Parallel Interfacing, 2x16 LCD, HD44780, ASCII
**Lab:** Activity: Interface LCD to 8051 and Display Name on LCD

**4/18-Fri:** Intro to Interrupts, Edge Triggered Interrupts, ISR Interrupt Service Routines
**Lab:** Lab 5 – Final Lab Servo + LCD

**4/25-Fri:
Lab:** Lab 5 Cont… Return Midterm 1 (sorry its so late) and Review

**5/02-Fri:**
**Lab:** Lab 5 Cont… and Midterm 2 Review

**5/09-Fri:** (Last Day of Instruction) **Midterm 2**
**Lab:** Lab 5 Cont…

Finals Week

**5/16-Fri:** Day of Final – Demo Final Lab 5 Servo + LCD

\*\*\* Special Note on Grading \*\*\*

Lab 5 Final Lab Servo + LCD will be worth 20pts instead of the normal 10pts
Midterm 1 and Midterm 2 weights were adjusted to 25% of overall Grade
Labs are worth 35%, Quizzes/Attendance are worth 15%

\*\*\*\* This was agreed upon with the whole class, but if you have any concerns regarding your particular situation, please don’t hesitate to come by my office or catch me after class to discuss.

**----------------------------------WORK IN PROGRESS BELOW----------------------------------------**

**11/8-Fri:** Timer Peripheral **–** 8Bit Auto-Reload Mode**,** More Timer Examples **Lab: Midterm 2 Review & Midterm 1 Return and Review (sorry I was late in getting these back). All graded items up till now will be updated and reflected in the canvas gradebook
Continue Lab 4:** Add Timer to Delay Function in previous LED Scrolling Lab

**3/01-Fri Lect11/12:**
**Lab11/12:**

**3/15-Fri: Lect11/12:** Timer Introduction **Lab7/8: Lab 2 Demo, Start Lab 3** add External Pushbutton and 2 Different Patterns

**3/22-Fri: Lect13/14:** Midterm1
**Lab13/14:**

**3/08-Fri: Lect11/12:** Quiz 3 (Bit-Masking, Port Input, IF Statements, SetBit/ClrBit), Timer Introduction **Lab7/8: Lab 3** add Timer Delay

**10/13-Fri: Midterm 1** (after Midterm1 we will be working on Lab3)
**Lab:** Lab 3 Cont… This is the last day to get help and work on Lab3 during Lab time. **Lab 3 is Due by beginning of next class on Canvas, a demo of your functioning board will be done during the next lab.**

**10/20-Fri: Lect 13/14: Lab 3 Demo (start of class, if a lab writeup is not complete or a demo is not ready, it will be considered late)
Lab14/15:**

**10/27-Fri: Lect 15/16: Interrupts, External HW Interrupts and Timer Interrupts
Lab14/15: start Lab 4 – Stepper Motor**

**11/03-Fri: Lect 17/18:
Lab: Lab 4 Cont…**

**11/10-Fri: Veteran’s Day (Campus Closed)**

**11/15-Wed: Lab 4 Writeup Due in Canvas, also upload a video for the demo.**

**11/17-Fri: Lect 19/20: Parallel Interfacing
Lab: Start Lab 5 – LCD + Servo**

**11/24-Fri: Fall Break-Thanksgiving Holiday (Campus Closed)**

**12/01-Fri: Lect 19/20: Parallel Interfacing
Lab: Start Lab 5 - LCD + Servo**

**12/08-Fri: Lect 19/20: Parallel Interfacing
Lab: Start Lab 5 – LCD + Servo**

**12/15-Friday: Final Exam - 10:15AM - 12:15PM in ECS-411**