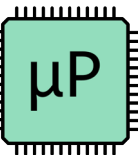


Final Project Kickoff

Lecture 13

Microprocessor-based Systems (E155)

Prof. Josh Brake



Tentative Schedule

Week	Monday Lecture	Wednesday Lecture	Due
8/24	Intro and Overview	C Programming	(Lab Demos)
8/31	Toolchains	ARM Assembly Programming	Lab 1 - GPIO Blink and GNU Toolchain
9/7	STM32 Datasheet	Clock Configuration and Timers	Lab 2 - ARM Assembly Sort
9/14	Common Digital Structures	Serial Interfaces - Pt. 1	Lab 3 - Digital Audio
9/21	Serial Interfaces - Pt. 2	Analog to Digital and Back Again	Lab 4 - Serial Peripheral Interface (SPI)
9/28	ARM CMSIS	Interrupts	Lab 5 - Pulse-width Modulation (PWM)
10/5	Project Kickoff	Internet of Things	Lab 6 - Serial Temperature Sensor
10/12	How To Pick a MCU	How To Pick a MCU and Custom Board Bringup	Lab 7 - The Internet of Things
10/19	PCB Design	Motors and Speakers	Project Proposal
10/26	Graphics and Displays	Bootloaders	Proposal Debriefs
11/2	Digital Business	Advanced MCU Topics	
11/9	Presentations	Presentations	Project Status Report & Demo
11/16	TBD	TBD	
11/23	Interview Questions	Happy Thanksgiving! No class	
11/30	Virtual Demo Day	No class	Project Checkoffs & Final Demos Due

Outline

- Final Project
 - Overview
 - Scope
 - Budget
 - Deliverables
 - Proposal
 - Status Report
 - Problem Presentations
 - Project Demonstration
 - Final Report and Demo Video
 - Grading
- Brainstorming time
- Report back

Overview

Overview

The E155 Final Project is a chance for you to apply your new skills in digital design to a moderate sized problem as part of a two-person team. You should begin thinking about a project and teammate right away. Your project has the following milestones:

Due Date	Deliverable
10/19	Project Proposal Due (via Sakai)
10/28-10/29	Proposal Debriefs (During checkoffs as team)
11/11-11/12	Project Status Report & Demo Due (During checkoffs as team)
11/23-12/2	Project Presentations (In class)
12/11-12/12	Project Checkoffs (During checkoffs as team)
12/13	Final Report Due (via Sakai)

Scope

- Be creative!
- Should be larger than a 1-week lab but small enough to be doable
- Your project should
 - Use new functionality of the STM32 MCU
 - Do something useful or interesting (maybe both?)
 - Lots of past examples on the course webpage and across the web.

Budget

- \$50 budget to purchase additional supplies not in your kit
- Order through Sydney whenever possible using the engineering department order form. List me as the approver.

Engineering Department Forms

Complete and Submit to Engineering Office

- [New Purchase Order Request Form](#) (Onbase)
- [Travel Request Form](#) (Formstack)
- [New Online Engineering Reimbursement Form](#) (Formstack)
- [Engineering Reimbursement form](#) (PDF)
- [Student Petition Form](#) (Formstack)
- [Engineering Student Stockroom Access Agreement](#) (Google Form)

Deliverables

- Project proposal
 - 2-page proposal
 - What are you going to build?
 - Be clear about deliverables, no stretch goals or wiggle room.
 - Include a budget for supplies
- Status report
 - 4-page report (plus appendices)
 - Joint team checkoff over Zoom
- Problem Presentations
- Project Demonstration

Deliverables continued

- Problem Presentations
 - 12-minute presentations in class
 - In-depth focus on particular technical problem that you are working on but have not yet solved.
- Project Demonstration
 - Demonstrate a working project to me over Zoom in a checkoffs slot.
 - You must show that your project meets spec.
 - Will be asked technical questions about the operation of your design.
 - Each day late a letter grade is deducted. Fail final project if no functional system is demoed by Friday.

Deliverables continued

- Final Report and Demo Video
 - Max 12-page report (plus appendices)
 - Clearly explain how your design works
 - Detail any specific techniques that would be useful for students in the future
- Demo Day
 - Show-and-tell style demonstration of final projects using demo videos
 - Will try to send some of the best projects (maybe a class vote) to be highlighted in HMC news or social media

Grading

Item	Weight
Proposal	10%
Status Report	20%
Presentation	10%
Demonstration	40%
Final Report	20%

Brainstorming

- Fill out spreadsheet with your team
- Breakout into rooms to brainstorm final project ideas
- Will report back after a few minutes in breakout rooms
- Follow up on #final-project channel on Slack after lecture

[Final Project Team Spreadsheet](#)

[Final Project Brainstorming Slides](#)

Up Next

- Wednesday: Internet of Things
- Lab 7: The Internet of Things
- Reminders
 - Make sure current times on the checkoff schedule are correct

Questions?

