Lab 1: Introduction To Embedded Systems

Onur Kilincceker (MSKU, Computer Engineering)

Contents

1. Course syllabus and project teams
2. Lab 1: C programming
3. Lab 2: Basics of Arduino Programming and Simulation (Toolchain)
4. Lab 3: Example for Arduino Programming and Simulation

1. Course syllabus and project teams

Onur Kilincceker (MSKU, Computer Engineering)

Course syllabus and project teams

Schedule

Date	Topic
Feb 26	General Introduction
Mar 5	Embedded System Basics and C programming
Mar 12	Lab 1: Basics of Arduino Programming
Mar 19	Sensors and Actuators
Mar 26	Lab 2: Modeling and Design of Embedded Systems with Arduino I
Apr 2	Timer, Interrupts and Communication
Apr 9	TBD: Midterm
Apr 16	Lab 3: Modeling and Design of Embedded Systems with Arduino II
Apr 23	Real Time Systems, Scheduling
Apr 30	Lab 4: Modeling and Design of Embedded Systems with Microcontrollers
May 7	IOT and Cyber Physical Systems, Embedded Machine Learning
May 14	Lab 5: IOT, Cyber Physical Systems, Embedded Machine Learning (Jetson Nano)
May 21	Projects Presentations
May 28	TBD: Final Exam

Course syllabus and project teams

Textbooks

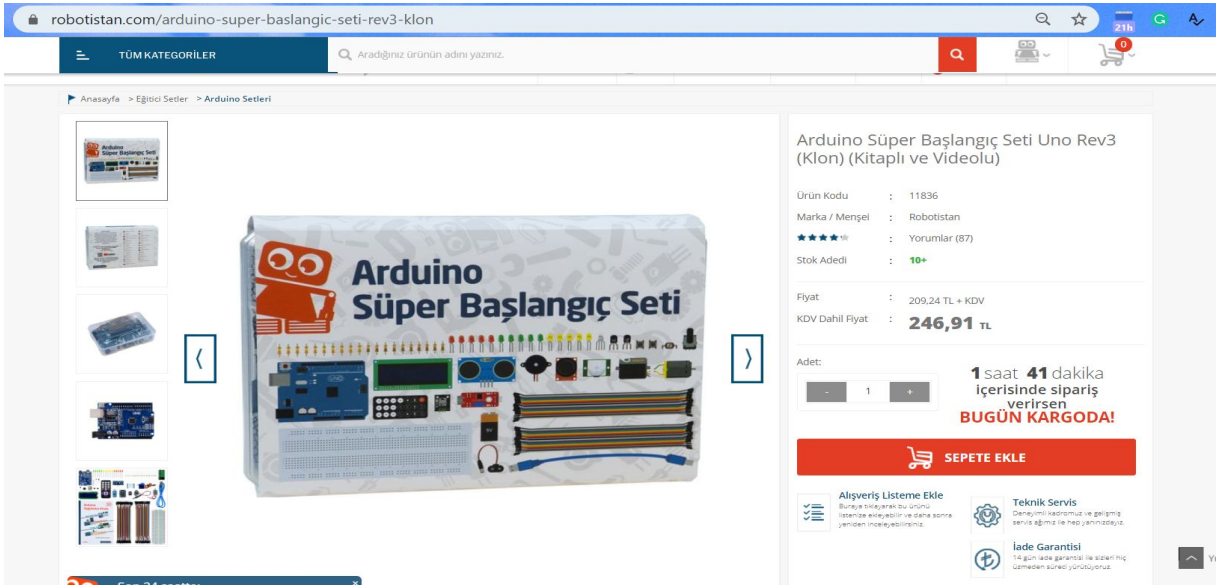
- Monk, S. (2016). Programming Arduino: getting started with sketches. McGraw-Hill Education.
- Monk, S. (2013). 30 Arduino projects for the evil genius. McGraw-Hill Education.
- Lee, E. A., & Seshia, S. A. (2017). Introduction to embedded systems: A cyber-physical systems approach. Mit Press.
- Russell, D. J. (2010). Introduction to embedded systems: using ANSI C and the arduino development environment. Synthesis Lectures on Digital Circuits and Systems, 5(1), 1-275.
- Kernighan, B. W., & Ritchie, D. M. (1988). C Programming Language, 2nd Edition. S.l.: Pearson.

Course syllabus and project teams

Grading

Midterm %20, Labs (Quiz) 30%, Final %50 (Project %30, Final Exam %20)

Lab Kit



Course syllabus and project teams

Simulation Tools

- Proteus: https://www.labcenter.com/simulation/
- MATLAB and Simulink for Embedded Systems: https://www.mathworks.com/solutions/embedded-systems.html
- SimulIDE: https://www.simulide.com/p/home.html
- Tinkercad: https://www.tinkercad.com/

Course syllabus and project teams

Project Proposal

9. Project Proposals: Project groups can consist of min 3 and max 5 people. One of these people will be chosen as the group leader who will be a representative person. Each group need to prepare a project proposal (see template below) for their ideas and then submit the proposal to TA (onurkilincceker@gmail.com) until **26th March 2021 (Deadline)**. Submission of the document will be carried out by group leader prior to project start.

Template

- Abstract
- Introduction (Motivation)
- Proposed Embedded Systems
- Embedded System Kit
- Plan

Course syllabus and project teams

10. Project Liability Statement: Each group members must fill a petition of their liability for project. See template for this petition. You need to submit "Project Liability Petition" for each person of your team with your project proposal until **26th March 2021 (Deadline)**. Submission of the document will be carried out by group leader prior to project start.

---------- Project Liability Petition----------

To: Mugla Sitki Kocman University, Computer Engineering Department, CENG 3006 Course Instructer (Assoc.Prof.Dr.Ufuk Bal)

I confirm that I will take equal responsibility with my other group members throughout the project. I also confirm that the software to be developed within the scope of the project will not be obtained directly from the resources provided on the internet and that in such case, I have full responsibility.

Email Addresses: Date

Name, Surname

Team Name

----------Petition End----------

Course syllabus and project teams

11. Project Deliverables: Submission of the deliverables will be carried out by group leader at the end of the project to TA (onurkilincceker@gmail.com) until **28th May 2021 (Deadline)**. Project deliverables must be zipped to a file that requires to be named as **CENG3006-GroupName-2021.zip**.

- Project Report
- Project Presentation
- Project Demo
- Other Materials (Codes, Graphics, Schematics etc.)