Alanya Alaaddin Keykubat University | Rafet Kayış Faculty of Engineering
Electrical-Electronics Engineering Department
2023-2024 Spring Semester

Syllabus

Code/Name	SEC 401.10 / Introduction to Microprocessors
Type	Required
Credit/ECTS	6/6
Hour per Week	3(3+0+0)
Level/Year	Undergraduate/4
Semester	Spring
Classroom	WWF	D104
Content	This lesson plan will introduce the students to physical computing: the process of building circuits and programming a microcontroller (an Arduino UNO) to interact with them. The lesson is broken into seven activities that will walk your students through the basics of setting up the Arduino and interacting with circuit parts like LEDs, buttons, and resistors. This introductory material will help prepare your students for more advanced Arduino projects.
Prerequisites	EEE 304 and EEE 306
Textbooks	*Primary* Class Notes T Pan, Y Zhu, Designing Embedded Systems with Arduino, Springer, 1th Ed., 2018. *Supplementary* S Monk, Programming Arduino Next Steps, Mc Graw-Hill, 2nd Ed., 2019.
Objectives	• To learn how to write and upload code to an Arduino. • To learn how to build a circuit on a breadboard. • To learn how to debug (troubleshoot) a circuit. • To learn to use Arduino functions for digital input and output. • To learn to use Arduino functions for analog input and output.
Course Outcomes	In this course you will be able to: CO1 understand the operation of microprocessors and microcontrollers. CO2 understand hardware interfacing techniques. CO3 design the hardware and software of microprocessor based systems. CO4 learn A/D and D/A conversion and how to digitize analog signals at required rates. CO5 learn interfacing memory and I/O to the selected microprocessor.

Weekly Schedule of Topics

W	Topic
1	Programming in the physical world
2	Introduction to the Arduino
3	Microcontroller overview
4	Electronics 101 for CS Majors
5	Actuators
6	Hardware timers, watchdogs and interrupt handling
7	Input / output
8	Serial communication
9	Wireless communication

10	IR line detection and motion control
11	Timers, PWM, analog / digital IO
12	Arduino PWM support versus low-level code for signal generation
13	PWM generator / motor speed controller
14	Basic robot control

Contribution to Program Outcomes*

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	5	5	1	5	1	5	1	3	2	3	1
CO2	4	4	1	5	0	4	4	3	4	3	1
CO3	5	5	3	5	2	4	1	3	1	2	1
CO4	5	4	3	4	0	5	2	3	1	4	1
CO5	4	4	1	4	0	5	4	3	4	1	2

* Contribution Level | 0: None | 1: Very Low | 2: Low | 3: Medium | 4: High | 5: Very High

Course Policy	• Be in the class on time. • English should always be used to communicate with one another. • At least 70% attendance is required, otherwise a grade of **DZ** will be assigned. • You must be present in class and present your term project.
Cheating & Plagiarism	• Copying or letting someone copy your work on exams, assignments, or reports is cheating. • Cutting and pasting text, figures and tables from web sources or any other electronic source is plagiarism. • The consequence of academic dishonesty is to receive a grade of **FF** for the course.
Evaluation	Project 10% Midterm 30% Final Exam 60% Total 100%

Instructor

Name/Surname	Emrah Irmak	Email	emrah.irmak@alanya.edu.tr
Room	228	Office Hours	Tu 10.30-11.30	F 15.30-17.30

Prepared by Emrah Irmak on June 7th, 2024.