ESOGÜ Electrical-Electronics Engineering Department

COURSE CODE: 151225393-151245393 **COURSE TITLE:** Introduction to Microcomputers

Semester	Weekly Hours		COURSE			
	Theoretical	**Practical**	**Credits**	**ECTS**	**Type**	**Language**
5	3	0	3	6	Compulsory (x) Elective ( )	Turkish ( ) English (x)

Write the credit (for non-credit courses weekly hours) below (If necessary distribute the credits.).

Math and Basic Science	Electrical Engineering [mark (√) if there is high design content]		General Education	Humanities
	3 (3)			

Assessment	THEORETICAL-PRACTICAL COURSES			LABORATORY COURSES		
	Type	**Number**	**%**	**Activity Type**	**Number**	**%**
Midterm	Midterm	1	30	Quiz		
	Quiz	4	20	Lab performance		
	Homework	5	10	Report		
	Project			Oral exam		
	Other (………)			Other (………)		
Final		1	40			
Makeup exam (Oral/Written)	Oral					
Prerequisites	Digital Systems II					
Brief content of the course	Introduction to microcomputer architecture, Structure of 8085 MPU, Type of memory chips, Memory decoder circuits, I/O decoder circuits, Software and Intel 8085 MPU instruction set, Usage of stack memory, Interrupt structure, Some programmable ICs that are used in serial and parallel communication and their interfacing with 8085 MPU, Some frequently used other peripheral devices.					
Objectives of the course	In this class, some fundamental structures about the 8-bit microcomputers are given. Student, who learn the subjects given in the class, will get any difficulty in learning higher level microprocessors.					
Contribution of the course towards professional education	A student, who I successful in this class, can analyze and design small scale 8-bit microprocessor system with 8085 MPU. The student can also write the necessary firm-ware for the designed microprocessor system.					
Outcomes of the course	An EE student who learnt the subjects given in this course can study the courses, where higher level microprocessor is thought, very easily.					
Textbook of the course	Microprocessor Architecture, Programming, and Application with 8085 Ramesh S. Goankar, Prentice Hall Publishing Company, 2002					
Other reference books	Microprocessor/Hardware Interfacing and Applications Barry B. Brey, Charles E. Merrill Publishing Company, 1884					
Required material for the course	8085 simulator					

WEEKLY PLAN OF THE COURSE

Week	Topics
1	Introduction to microcomputers, Fundamental parts in a microprocessor, Memory, MPU, I/O
2	Memory types, Memory IC pin outs, 8085 MPU architecture, 8085 MPU pin out
3	Design of memory decoder circuitry, which contains various type and capacity memory ICs, ,via decoder ICs, Some detailed memory decoder circuit with decoder ICs examples.
4	Design of memory decoder circuitry by means of PROM memory chips, Some detailed memory decoder circuit with PROM ICs examples
5	Design of incompletely specified memory decoder circuits, comparison of incompletely specified decoder circuits with the completely specified ones in terms of cost and firm-ware writing, I/O decoders, Memory mapped I/O decoders, I/O mapped (isolated I/O) I/O decoders, Comparion of these two I/O decoder circuits, Solutions to detailed examples.
6	Preparation of a firm-ware, Tasks of an assembler compiler, Assembler compiler directives, 8085 instruction set, Some explanatory examples.
7	Subroutines, Usage of a subroutine, Stack memory and subroutines, Writing delay subroutines, Calculation of execution time for a delay subroutine, Some explanatory examples.
8	Midterm
9	Midterm
10	8085 interrupt structure, Pins of 8085 related with its interrupt structure, Detailed explanation of 8085 interrupt structure by means of a diagram.
11	Explanation of 8085 interrupt structure via a detailed system program, Realization of RST0, RST1,…..RST7 via a simple hardware (obtaining extra seven hardware interrupt pin)
12	Parallel communication between microcomputers, 8255 PIA IC and its operation modes, 8155 PIA and its operation modes, Necessary detailed examples
13	Serial communication between microcomputers, 8251 USART IC and its operation modes, Necessary detailed examples
14	Some widely used VDUs, Interfacing of (seven segment display) SSDs, 2x16 character based LCD, Their interfacings with 8085, Necessary detailed examples
15,16	Final

NO	OUTCOMES OF THE PROGRAMME	4	3	2	1
1	Adequate knowledge of mathematics, science and Electrical and Electronic Engineering; ability to practice theoretical and practical knowledge of these areas into modeling and solving complex problems of Electrical and Electronic Engineering	X			
2	Ability to identify complex engineering problems in Electrical and Electronic Engineering and related fields, for this purpose having skills to formulate, select and apply appropriate methods.				
3	Having skills to apply modern design methods to design a complex system, process, equipment or product that should work under realistic conditions and constraints and satisfy specific requirements concerning the Electrical and Electronic Engineering.		X		
4	Having skills to develop, select and apply modern techniques and tools needed to analyze and solve complex applications in Electrical and Electronic Engineering, skills to use information technology effectively.		X		
5	Skills to design and conduct tests, collect data, analyze results, and interpret data for the experimental investigation of complex problems in Electrical and Electronic Engineering		X		
6	Ability to function effectively as an individual and as a member of teams within the discipline and in multidiscipline areas.				
7	Communicating effectively in oral and written form both in Turkish and English. Effective report writing and understanding written reports, preparing design and manufacturing reports, making effective presentations, skills to give and receive clear and concise instructions.				
8	Awareness of the necessity of lifelong learning, access to information, monitoring developments in science and technology and the ability to self-renewing				
9	Understanding of professional and ethical responsibility				
10	Information on project management, change management and risk management practices, awareness on entrepreneurship and innovation, knowledge on sustainable development.				
11	Information about universal and societal effects of engineering applications on health, safety and environment; awareness of the legal consequences of engineering solutions.				

Scale for assessing the contribution of the course to the program outcomes:

4: High   **3: Medium**   **2: Low**   **1:None**

Name of Instructor(s): Salih FADIL

Signature(s): Prof. Dr. Salih FADIL   **Date:**