



# ESOGÜ Electrical-Electronics Engineering Department

**COURSE CODE:** 151227638 - 151247638

**COURSE TITLE:** Microcontrollers

Semester	Weekly Hours		COURSE				
	Theoretical	Practical	Credits	ECTS	Type	Language	
7	3	2	4	7	Compulsory ( ) Elective ( x )	Turkish ( ) English ( x )	
Write the credit (for non-credit courses weekly hours) below (If necessary distribute the credits.).							
<b>Math and Basic Science</b>		<b>Electrical Engineering</b> [mark (√) if there is high design content]		<b>General Education</b>	<b>Humanities</b>		
		3	( )				
<b>Assessment</b>		<b>THEORETICAL-PRACTICAL COURSES</b>			<b>LABORATORY COURSES</b>		
		<b>Type</b>	<b>Number</b>	<b>%</b>	<b>Activity Type</b>	<b>Number</b>	<b>%</b>
<b>Midterm</b>		Midterm	1	20	Quiz		
		Quiz			Lab performance		
		Homework			Report		
		Project			Oral exam		
		Other (.....)		50	Other (.....)		
<b>Final</b>			1	30			
<b>Makeup exam (Oral/Written)</b>		Oral					
<b>Prerequisites</b>		Digital Systems I, Digital Systems II, Introduction to Microcomputers					
<b>Brief content of the course</b>		Fundamental structures in PIC16F877, Modules in PIC16F877, Programming of PIC16F877 by PIC assembly, MPASM					
<b>Objectives of the course</b>		In this class, structure, programming and application of midrange PIC microcontrollers (typically PIC16F877) are given.					
<b>Contribution of the course towards professional education</b>		%50 of general average grade comes from the lab in this class. The students, taking this class gains some theoretical and hands on experience about PIC midrange microcontrollers.					
<b>Outcomes of the course</b>		A student, who digests the knowledge given in this class and successful in his term project, can analyze and design microcontroller system for specific purposes. Also this student can study and understand higher level microcontrollers (for instance 18 series) by himself					
<b>Textbook of the course</b>		PICmicro Mid-Range MCU Family Reference Manual, Microchip Technology Inc. 1997					
<b>Other reference books</b>		Auxiliary tools such as example program and projects, data books, manuals can be found in <a href="http://www.microchip.com">www.microchip.com</a> web site.					
<b>Required material for the course</b>		Necessary hardware components for each project are bought by the student in that group.					

WEEKLY PLAN OF THE COURSE	
Week	Topics
1	Introduction to mid-range PIC microcontrollers, Oscillators, Reset circuit, Necessary examples related with the subjects
2	Architecture, CPU and ALU, Memory organizations, Necessary examples related with the subjects
3	Data EEPROM, Interrupts, I/O ports, Necessary examples related with the subjects
4	PSP (parallel slave port), Timer0, Timer1, PSP (parallel slave port), Timer0, Timer1, Necessary examples related with the subjects
5	Timer2, CCP module, Timer2, CCP module, Necessary examples related with the subjects
6	MSSP module, USART, Necessary examples related with the subjects
7	10-bit ADC module, In circuit serial programming, Necessary examples related with the subjects
8	Midterm
9	Midterm
10	Instruction set, Necessary examples related with the subjects
11	Summary of MPASM, Necessary examples related with the subjects
12	PIC assembler compiler directives, Necessary examples related with the subjects
13	The general structure of MPLAB IDE, Necessary examples related with the subjects
14	Introduction of a sample project (hardware and software)
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				
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.		X		
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):**

**Signature(s):**

**Date:**