ESOGÜ Electrical-Electronics Engineering Department

COURSE CODE: 151223557 - 151243557   **COURSE TITLE:** Digital Systems I

Semester	Weekly Hours		COURSE			
	Theoretical	**Practical**	**Credits**	**ECTS**	**Type**	**Language**
3	4	0	4	7	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**
0	3	(√)	0	0

Assessment	THEORETICAL-PRACTICAL COURSES			LABORATORY COURSES		
	Type	**Number**	**%**	**Activity Type**	**Number**	**%**
Midterm	Midterm	1	40	Quiz		
	Quiz	3	20	Lab performance		
	Homework			Report		
	Project	1	10	Oral exam		
	Other (………)			Other (………)		
Final		1	30			
Makeup exam (Oral/Written)	Oral and Written					

Prerequisites	
Brief content of the course	Digital systems, Combinational Circuit Analysis and Design, Combinational Circuits (Decoder, Encoder, Multiplexer, Arithmetic), Hardware Description Language (HDL), Sequential Circuits Analysis and Design
Objectives of the course	The aim of the course is to introduce combinational and sequential circuit components and to teach analysis and design techniques for combinational and sequential circuits.
Contribution of the course towards professional education	Students recognize basic elements of digital systems and learn system design using combinational and sequential circuits. And also they know the use of HDL for digital circuit analysis and design.
Outcomes of the course	Students: 1. recognize elements of digital systems 2. define combinational circuits (logic gates, decoders, encoders, etc.) and can explain their functions. 3. analyze and design combinational circuits 4. defines storage elements (latches and flip-flops) and their functions 5. analyze and design sequential circuits. 6. defines programmable logic devices. 7. use HDL in simulation and design of the digital systems.
Textbook of the course	Logic and Computer Design Fundamentals, M.Mano and R.Kime, Prentice Hall, 2004, 4th edition.
Other reference books	Digital Design Principles and Practice, J.F. Wakerly, Prentice Hall 2001. Digital Design, M. Mano, Prentice Hall 2002.
Required material for the course	

WEEKLY PLAN OF THE COURSE

Week	Topics
1	Digital Computers and Information
2	Boolean Algebra and Karnough Maps
3	Logic IC Circuits and Combinational Logic Design
4	Programmable Implementation Technologies
5	Combinational Logic Functions and Circuits
6	Combinational Logic Implementations
7	Arithmetic Functions and Circuits
8	Midterm
9	Midterm
10	Combinational Circuits and HDL
11	Sequential Circuits, Latches and Flip-Flops
12	Sequential Circuit Analysis
13	Sequential Circuit Design
14	Sequential Circuits and HDL
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.		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.				
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				
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.		X		
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: