ESOGU ELECTRICAL-ELECTRONICS ENGINEERING DEPARTMENT
COURSE INFORMATION FORM

Course Title	Course Code
Digital Systems Lab.	**151224298**

Semester in Program	Number of Course Hours per Week		ECTS Credit
	Theory	Practice	
4	0	2	2

Course ECTS Credit Distribution				
Basic Sciences	**Engineering Sciences**	**Design**	**General Education**	**Social**
	2			

Language of Instruction	Course Level	Course Type
English	Undergraduate	Required

Prerequisite	None
Objectives of the Course	Learning the introduced tools and techniques used in digital circuit analysis and design. Learning how to use of combinational and sequential circuits in some applications. Having introductory level knowledge on HDL CAD tools.
Brief Course Content	Introduction to laboratory equipments, IC gates, digital system analysis using LogicWorks/Proteus ISIS , binary and decimal system, combinational circuits, counters, sequential circuits, digital system design using HDL and CAD tools..

	Learning Outcomes of the Course	Contributed POs	Teaching Methods *	Assessment Methods **
1	Recognition and employment of the tools and techniques used in digital system design.	1b,1c,1d,2	1,2	A,B,C,D,E,G,I,K
2	Having basic skills to build logic functions with discrete components.	1,2,3,4,5,6,7	1,2,3	A,B,C,D,E,G,I,K
3	Having knowledge on IC gate implementation technologies	1,2,3,4,5,6,7	1,2,3	A,B,C,D,E,G,I,K
4	Being able to describe digital system in HDL and can do simulations in Xilinx ISE	1,2,3,4,5,6,7	1,2,3,4	A,B,C,D,E,G,I,K
5	Having basic skills to build logic functions with microcontrollers.	1,2,3,4,5,6,7	1,2,3,4	A,B,C,D,E,G,I,K
6				
7				
8				

***Teaching Methods** **1:**Lecture, **2:**Discussion, **3:**Experiment, **4:**Simulation, **5:**Question-Answer, **6:**Tutorial, **7**:Observation, **8**:Case Study, **9:**Technical Visit, **10:**Problem Solving, **11:**Induvidual Work, **12**:Team/Group Work, **13**:Brain Storm, **14:**Project Design / Management, **15:**Report Preparation and/or Presentation

****Assessment Methods** **A:**Exam, **B:**Quiz, **C:**Oral Exam, **D:**Homework, **E:**Report, **F:**Article Examination, **G:**Presentation, **I:**Experimental Skill, **J:**Project Observation, **K**:Class Attendance; **L**:Jury Exam

Main Textbook	Logic and Computer Design Fundamentals, M.Mano and R.Kime, Prentice Hall, 2004, 4th edition.
Supplementary Resources	Digital Design Principles and Practice, J.F. Wakerly, Prentice Hall 2001.
Necessary Course Material	Equipment and all or the most of the parts are supplied in digital systems laboratory. Some student contributions for electronic parts may be required for some of the experimental work.

Course Weekly Schedule	
1	Digital Systems Laboratory Equipments
2	IC Logic Gates
3	Digital Circuit Analysis with LogicWorks
4	Binary and Decimal Numbers
5	Combinational Circuit Design for Conversion
6	Arithmetic Circuits: Adders and Subtractors
7	Combinational Circuit Design with Multiplexers
8	Mid-Term Exams
9	Flip-Flops, Counters
10	Sequential Circuits
11	Combinational Circuits and HDL
12	Sequential Circuits and HDL
13	Logical Function Implementation via Microcontroller Software
14	Experiment Design in Selected Topic - Introduction
15	Experiment Design in Selected Topic - Presentation
16,17	Final Exams

Calculation of Course Workload			
Activities	**Count**	**Time (Hour)**	**Total Workload (Hour)**
Weekly classroom time	14	2	28
Weekly study time (review, reinforcing, preparation)	14	1	14
Homework			
Taking a quiz	10	0.5	5
Studying for a quiz			
Oral exam			
Studying for an oral exam			
Report writing (Preparation and presentation time included)	10	1	10
Project (Preparation and presentation time included)			
Presentation (Preparation time included)			
Mid-Term Exam			
Studying for Mid-Term Exam			
Final Exam			
Studying for Final Exam			
		Total workload	**57**
		Total workload / 30	**1.9**
		Course ECTS Credit	**2**

Assessment	
Activity Type	**%**
Mid-term	0
Quiz, Oral Exam, Homework, Presentation, Class Attendance etc.- one or more may apply for each experimental work	100
Final Exam	0
Total	100

COURSE CONTRIBUTION TO THE PROGRAM OUTCOMES (5: Very high, 4: High, 3: Middle, 2: Low, 1: Very low)		
NO	**PROGRAM OUTCOMES**	**Contribution**
1	a. Sufficient knowledge of mathematics	1
	b. Sufficient knowledge of basic sciences	3
	c. Sufficient basic engineering and Electrical-Electronics engineering knowledge	5
	d. Skill of applying all these knowledge and experience to complicated Electrical-Electronics engineering problems	5
2	Skill of identifying, defining, formulating, and solving complex problems in Electrical-Electronics engineering and related areas by selecting and applying appropriate analysis and modeling methods, while considering the relevant UN Sustainable Development Goals.	4
3	Skill of designing a complicated process, system, equipment or product by applying modern design methods under realistic constraints and conditions.	4
4	To analyze and solve the complicated engineering problems: a. skill of developing, selecting and applying the required techniques and devices	4
	b. skill of using information technologies effectively	1
5	To study the complicated Electrical-Electronics engineering problems and research subjects: a. skill of experimental design	3
	b. skill of performing the experiments, collecting the data and analyzing and interpreting the results	4
6	a. Skill of performing individual studies	3
	b. Skill of performing intra and interdisciplinary and multidisciplinary teamwork and studies	3
7	a. Skill of effective oral and writing communication in Turkish	3
	b. Skill of improving and using foreign language knowledge	3
	c. Skill of effective reporting, understanding the reports and preparing the design and production reports	3
	d. Skill of effective presentation and giving and getting clear and understandable instructions.	3
8	Awareness of the necessity of life-long learning and skill of accessing to information and following the improvements in contemporary science and technology	
9	a. Awareness of necessity of behaving in accordance with the ethical principles and awareness of the importance of having professional ethical responsibilities	
	b. Knowledge about legal regulations and standards of engineering	
10	a. Knowledge about project management, risk management and change management	
	b. Awareness of the significance of entrepreneurship and innovation	
	c. Knowledge about sustainable development	
11	Knowledge of the effects of engineering applications on health, environment, economy, sustainability, and safety on global and societal dimensions within the scope of the UN Sustainable Development Goals; awareness of national and international legal regulations and standards, as well as the legal consequences of engineering solutions.	
12	Knowledge about modern problems in local and universal scale	

INSTRUCTORS				
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Date:08.07.2026