

ELEC1412 COURSE CATALOG INFO

Course Code : ELEC1412				Course Name : Logic Design Laboratory			
Semester	Lecture (Le+T+L)	Local Credit	ECTS	Language	Category	Instructional Methods	Prerequisites
1	(0+0+2)	1	2	English	Core	Laboratory	Corequisite: ELEC1411
Course Content	Verification of logic gates. Introduction to combinational circuits. Introduction to VHDL. Binary adder circuit. Binary adder-subtractor circuit. Combinational circuit design. Multiplexers. Flip-flops. Counters.						
Course Outcomes	<p>CO1. Construct and analyze multi-level combinational logic circuits containing AND, OR, NOT, NAND, NOR, and XOR gates.</p> <p>CO2. Apply Boolean algebra and Karnaugh maps to simplify the Boolean expressions and design simplified logic circuits using logic gates.</p> <p>CO3. Design and analyze modular combinational logic circuits containing multiplexers, adders / subtractors, multipliers and 7-segments display decoders.</p> <p>CO4. Design and develop sequential circuits.</p> <p>CO5. Translate real world problems into digital logic formulations, set up them and analyze.</p> <p>CO6. Simulate a logic circuit using VHDL.</p> <p>CO7. Develop basic laboratory skills: record data, write well-organized technical reports.</p> <p>CO8. Acquire the skill of work in team and share responsibilities of circuit construction.</p>						

COURSE PLAN

W1	Introduction
W2	Logic Gates
W3	Introduction to Combinational Circuits
W4	VHDL (Verilog Hardware Description Language)
W5	Binary Adder Circuit
W6	Binary Adder – Subtractor Circuit
W7	Combinational Multiplier
W8	Design of Two-Level Circuits Using NAND and NOR Gates
W9	Karnaugh Maps
W10	Incompletely Specified Functions Design
W11	Combinational Circuit Design

W12	Multiplexers
W13	Flip-Flops
W14	Final Project Presentation / Make-up

COURSE ASSESMENT AND ECTS WORK LOAD			
Type of Work	Count	ECTS WORK LOAD	
		Time (Hour)(Including prep. time)	Work Load
Attendance		0	0
Final Exam	1	4	4
Quizzes			0
Term project	1	4	4
Reports	10	1	10
Final Project			0
Seminar			0
Assignments			0
Presentation			0
Midterms			0
Project			0
Laboratory	14	2	28
Tutorial		0	0
Other(Self study, Paper reviews)	10		4
		Total work load	50
		Total work load/25	2
		ECTS Credit	2

COURSE ASSESMENT AND ECTS WORK LOAD

PO	Program Outcomes	CO
1	1.1. Adequate knowledge in fundamentals of mathematics (algebra, differential equations, integrals, probability etc), science (physics, chemistry, biology etc.) and computer science (programming and simulation);	
	1.2. ability to use theoretical and applied knowledge in these areas in complex engineering problems.	
2	2.1. Ability to identify, formulate, and solve complex engineering problems;	
	2.2. ability to select and apply proper analysis and modeling methods for this purpose.	1,5
3	3.1. Ability to design and integrate components of a complex system or process, as they relate to Electrical and Electronics Engineering discipline, under realistic constraints and conditions, in such a way as to meet desired requirements;	2,3,4
	3.2. ability to apply modern design methods.	
4	4.1. Ability to devise, select, and use techniques and tools needed for analyzing and solving complex problems encountered in engineering practice;	6
	4.2. ability to employ information technologies effectively.	
5	5.1. Ability to design experiments,	
	5.2. ability to conduct experiments, gather, analyze and interpret data.	7
6	6.1. Ability to work in intra-disciplinary teams;	8
	6.2. ability to work in multi-disciplinary teams;	
	6.3. ability to take individual responsibilities.	
7	7.1. Ability to effectively communicate via written and oral means;	
	7.2. knowledge of at least one foreign language;	
	7.3. ability to write effective reports and comprehend written reports;	7
	7.4. ability to write design and manufacturing reports	
	7.5. ability to present effectively,	
	7.6. ability to give and follow clear instructions.	7

8	8.1. Recognition of the need for lifelong learning;	
	8.2. ability to access information, to follow developments in science and technology, and to continue to educate him/herself.	
9	9.1. Consciousness to behave according to ethical principles, and about professional and ethical responsibility;	
	9.2. knowledge on standards used in engineering practice.	
10	10.1. Knowledge about business life practices such as project management, risk management, and change management;	
	10.2. awareness in entrepreneurship, innovation;	
	10.3. knowledge about sustainable development.	
11	11.1. Knowledge about the global and social effects of engineering practices on health, environment, and safety, and contemporary issues of the century reflected into the field of engineering;	
	11.2. awareness of the legal consequences of engineering solutions.	

Revision Date	Prepared by	Approved by
1.9.2019, 1.6.2021	Dr.Ebru Gürsu Çimen	Prof.Dr. Ahmet Aksen