



**ESOGU ELECTRICAL - ELECTRONICS ENGINEERING DEPARTMENT
COURSE INFORMATION FORM**

Course Title	Course Code
CIRCUITS LABORATORY	

Semester in Program	Number of Course Hours per Week		ECTS
	Theory	Practice	
3	0	2	2

Course ECTS Credit Distribution				
Basic Sciences	Engineering Sciences	Design	General Education	Social
0	1	1	0	0

Language of Instruction	Course Level	Course Type
English	Undergraduate	Required

Prerequisite	
Objectives of the Course	Teaching basic circuit connections and their power calculations. Teaching the working principle of voltmeter loading, Thevenin Theorem, Wheatstone bridge circuits. Teaching how to use signal sources and oscilloscope. Teaching working principles of RC and RL circuits. Teaching the working principle of op-amps.
Brief Course Content	Series and Parallel Connections. Power Calculations. Voltmeter Loading, Thevenin's Theorem, The Wheatstone Bridge. Signal Sources and the usage of Oscilloscope. Inductors, Capacitors, RL Circuits, RC circuits, Op-amp Circuits. Voltage and Current Conversion Circuits.

Learning Outcomes of the Course	Contributed POs	Teaching Methods *	Assessment Methods **
1 Learn basic circuit connections and their power calculations	1, 2, 5	3, 4, 12	A, E, I
2 Learn the working principle of voltmeter/ammeter, Thevenin Theorem, Wheatstone bridge circuits	1, 2, 5	3, 4, 12	A, E, I
3 Learn how to use signal sources and oscilloscope	1, 2, 5	3, 4, 12	A, E, I
4 Learn working principles of RL and RC circuits. Learn the working principle of op-amps	1, 2, 5	3, 4, 12	A, E, I
5			
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:Individual 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	Laboratory experiment manuals
Supplementary Resources	
Necessary Course Material	Electronic experiment kit, Oscilloscope, Voltmeter, Signal Generator, and fundamental circuit elements specific to each experiment.

Course Weekly Schedule	
1	Introduction to the Lab
2	Introduction to the course
3	Series and Parallel Connections, Power Calculations,
4	Voltmeter Loading
5	Thevenin's Theorem
6	The Wheatstone Bridge
7	Signal Sources and Using the Oscilloscope
8	Mid-Term Exams
9	Inductors and RL Circuits
10	Capacitors and RC circuits
11	Resonant Circuits
12	Op-amp Circuits
13	Voltage Conversion Circuits
14	Current Conversion Circuits
15	Practical Exam
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			
Studying for a quiz			
Oral exam			
Studying for an oral exam			
Report writing (Preparation and presentation time included)	11	1	11
Project (Preparation and presentation time included)			
Presentation (Preparation time included)			
Mid-Term Exam			
Studying for Mid-Term Exam			
Final Exam	1	2	2
Studying for Final Exam	1	5	5
		Total workload	60
		Total workload / 30	2
		Course ECTS Credit	2

Assessment	
Activity Type	%
Experimental Skill	45
Report	25
Final Exam	30
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	4
	b. Sufficient knowledge of basic sciences	4
	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	4
2	Skill of defining, identifying, formulating and solving the complicated problems in Electrical-Electronics engineering and related areas by applying appropriate analysis and modelling methods.	4
3	Skill of designing a complicated process, system, equipment or product by applying modern design methods under realistic constraints and conditions.	
4	To analyze and solve the complicated engineering problems:	
	a. skill of developing, selecting and applying the required techniques and devices	
	b. skill of using information technologies effectively	
5	To study the complicated on the complicated Electrical-Electronics engineering problems and research subjects:	5
	a. skill of experimental design	
	b. skill of performing the experiments, collecting the data and analyzing and interpreting the results	5
6	a. Skill of performing individual studies	
	b. Skill of performing intra and interdisciplinary and multidisciplinary teamwork and studies	
7	a. Skill of effective oral and writing communication in Turkish	
	b. Skill of improving and using foreign language knowledge	
	c. Skill of effective reporting, understanding the reports and preparing the design and production reports	
	d. Skill of effective presentation and giving and getting clear and understandable instructions.	
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 about the effects of engineering applications and practices on the global and social health, ecology and safety, knowledge about the current problems in relation to the working areas of Electrical-Electronics engineering; and awareness of the legal issues resulting from engineering solutions	
12	Knowledge about modern problems in local and universal scale	

LECTURER(S)				
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Date: 06.07.2024