



ESOGU ELECTRICAL-ELECTRONICS ENGINEERING DEPARTMENT COURSE INFORMATION FORM

Course Title	Course Code
ENGINEERING DESIGN WITH FUZZY LOGIC	151228XXX

Semester in Program	Number of Course Hours per Week		ECTS Credit
	Theory	Practice	
8	2	4	9

Course ECTS Credit Distribution				
Basic Sciences	Engineering Sciences	Design	General Education	Social
0	4	5	0	0

Language of Instruction	Course Level	Course Type
English	Undergraduate	Elective

Prerequisite	No formal prerequisite; however, prior knowledge of engineering design principles and fuzzy logic is recommended.
Objectives of the Course	This course aims to provide students with hands-on experience in designing an engineering project using fuzzy logic principles. Through teamwork, students will gain practical design experience by applying the knowledge acquired throughout their education. The course also focuses on project management, problem redefinition, and communication skills.
Brief Course Content	Students will form teams to design a complex engineering project. Teams will go through the entire process of engineering design, from understanding the problem to developing and presenting their solutions. Topics include fuzzy logic fundamentals, project management principles, and effective teamwork.

Learning Outcomes of the Course	Contributed POs	Teaching Methods *	Assessment Methods **
1 Gain hands-on design experience through teamwork.	6b	12	J
2 Learn and apply project management techniques.	3,6b	14	J
3 Develop the ability to understand and redefine engineering problems.	3,6b	10	J
4 Acquire skills to design engineering solutions using fuzzy logic.	3,6b	14	J
5 To prepare a final project report, present a demo, and make an oral presentation.	7c	15	E,G
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	Timothy J. Ross, Fuzzy Logic with Engineering Applications, Wiley, 2010.
Supplementary Resources	John Harris, An Introduction to Fuzzy Logic Applications, Springer, 2021.
Necessary Course Material	Students will require access to MATLAB or other programming tools for fuzzy logic implementations. Additional lab materials for design and testing will be provided during class.

Course Weekly Schedule	
1	Introduction to the course and team assignments
2	Fundamentals of fuzzy logic
3	Fuzzy inference systems
4	Project planning and management tools
5	Problem definition and analysis
6	Project design and development
7	Project design and development
8	Mid-Term Exams
9	Project design and development
10	Report writing and documentation techniques
11	Prototype testing and debugging
12	Presentation and communication skills for engineers
13	Final project development
14	Review and feedback
15	Final presentations and project report
16,17	Final Exams

Calculation of Course Workload			
Activities	Count	Time (Hour)	Total Workload (Hour)
Weekly classroom time	14	6	84
Weekly study time (review, reinforcing, preparation)	14	8	112
Homework			
Taking a quiz			
Studying for a quiz			
Oral exam			
Studying for an oral exam			
Report writing (Preparation and presentation time included)	1	35	35
Project (Preparation and presentation time included)	1	39	39
Presentation (Preparation time included)			
Mid-Term Exam	1		
Studying for Mid-Term Exam	1		
Final Exam	1		
Studying for Final Exam	1		
Total workload			270
Total workload / 30			9
Course ECTS Credit			9

Assessment	
Activity Type	%
Presentation	30
Jury Exam	70
Final Exam	Jury
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	
	b. Sufficient knowledge of basic sciences	
	c. Sufficient basic engineering and Electrical-Electronics engineering knowledge	
	d. Skill of applying all these knowledge and experience to complicated Electrical-Electronics engineering problems	
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.	
3	Skill of designing a complicated process, system, equipment or product by applying modern design methods under realistic constraints and conditions.	5
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:	
	a. skill of experimental design	
	b. skill of performing the experiments, collecting the data and analyzing and interpreting the results	
6	a. Skill of performing individual studies	
	b. Skill of performing intra and interdisciplinary and multidisciplinary teamwork and studies	5
7	a. Skill of effective oral and written communication in Turkish and English	
	b. Skill of improving and using foreign language knowledge	
	c. Skill of effective reporting, understanding the reports and preparing the design and production reports	5
	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 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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