ESOGU ELECTRICAL - ELECTRONICS ENGINEERING DEPARTMENT
COURSE INFORMATION FORM

Course Title	Course Code
AUTOMATION PROCESS DESIGN	151228xxx

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

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

Language of Instruction	Course Level	Course Type
English	Undergraduate	Required

Prerequisite	
Objectives of the Course	To provide students with the fundamental principles and practical methods for designing automated processes, including process modeling, instrumentation, control system design, and system integration, with an emphasis on efficiency, safety, and reliability.
Brief Course Content	The course covers the design of AI-enabled automation systems for industrial processes, including process analysis, sensors and machine vision, data acquisition, image processing, machine learning for quality inspection, control system integration, and real-time decision making. Students complete a hands-on project by developing an AI-based vision system to automatically detect, for instance, defective cookies on a production line and integrate it into an automated inspection process.

Learning Outcomes of the Course	Contributed POs	Teaching Methods *	Assessment Methods **
1 Learning an ai tool for process automation	1,2,5,7	1,2,3,4	E,G,J
2 Evaluating outcomes of an automation process	1,2,5,7	1,2,3,4	E,G,J
3			
4			
5			

***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	F. Lamb, *Industrial Automation: Hands-On*, 1st ed. New York, NY, USA: McGraw-Hill Education, 2013.
Supplementary Resources	
Necessary Course Material	

Course Weekly Schedule	
1	Design issues of the aimed system and expectations
2	Preperation of design requirements. Basic setups for testing specific parts
3	Discussions of the design parts
4	Evaluation of the working components and flaw corrections
5	Combining already working/complete parts
6	Evaluation of the combined components and flaw corrections
7	Start building entire system
8	Mid-Term Exams
9	Evaluation of complete system and flaw corrections
10	Flaw correction and evaluation of alternative approaches
11	Develop a complete test and evaluation flow
12	Completion of entire working design
13	Mechanical designs (if applicable) and enclosures
14	Problems and siscussions on enclosures/user interfaces
15	Full tests, rebuilds, final touches, reports
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	3	42
Homework			
Taking a quiz			
Studying for a quiz			
Oral exam			
Studying for an oral exam			
Report writing (Preparation and presentation time included)	11	4	44
Project (Preparation and presentation time included)	14	10	140
Presentation (Preparation time included)	4	4	16
Mid-Term Exam			
Studying for Mid-Term Exam			
Final Exam			
Studying for Final Exam			
		Toplam iş yükü	**270**
		Toplam iş yükü / 30	9
		Dersin AKTS Kredisi	**9**

Assessment	
Activity Type	**%**
Mid-term	
Experiment Reports	20
Term Project Report & Presentation	80
Final Exam	
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.	5
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	5
	b. skill of using information technologies effectively	5
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 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.	5
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	

LECTURERS				
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