



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

Course Title	Course Code
PRINCIPLES OF ENERGY CONVERSION	151226375

Semester in Program	Number of Course Hours per Week		ECTS Credit
	Theory	Practice	
6	3	0	5

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

Language of Instruction	Course Level	Course Type
English	Undergraduate	Compulsory

Prerequisite	Electromagnetic Fields
Objectives of the Course	Some fundamental knowledge that is used in Electric Machinery, Electric Power System Analysis I, II classes is given to the students.
Brief Course Content	Electromechanical energy conversion, Transformers, Pu systems, Solutions to three phase symmetrical circuits, Power in three phase system.

Learning Outcomes of the Course	Contributed POs	Teaching Methods *	Assessment Methods **
1 They will learn the subjects about the electric machines.	1c, 2	1	A
2 They will learn the subjects about the electric power systems.	1c, 2	1	A
3			
4			
5			
6			

*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	Energy Conversion, Electric Motors and Generators, Raymond Ramshaw, R. G. Heeswijk, Saunders College Publishing , 1990
Supplementary Resources	Electric Machinery, E. Fitzgerald, Charles Kingsley Jr., Stephen D. Umans,
Necessary Course Material	None

Course Weekly Schedule	
1	Introduction to electromechanical energy conversion, Faraday's law and emf, Solutions to some related examples.
2	Lorenz's force, Fundamental generator operation, Fundamental motor operation, Solutions to some related examples.
3	Continuous electromechanical energy conversion, Electromechanical energy conversion and dynamic circuits, Solutions to some related examples.
4	Singly-excited rotational systems, Multiply-excited rotating systems, Solutions to some related examples.

5	Translational systems, Solutions to some related examples.
6	Moment and stored magnetic energy, coenergy, Solutions to some related examples.
7	Electrostatic devices, Dynamic circuit analysis, Solutions to some related examples
8	Mid-Term Exams
9	Transformers and Equivalent circuit of a two-winding single phase transformer, Solutions to some related examples
10	Pu systems, Solutions to some related examples
11	Solutions to symmetric three-phase circuits including transformers, Solutions to some related examples
12	Power definitions in three-phase power systems, Solutions to some related examples
13	Power-flow analysis,
14	Solutions to some related examples
15	Solutions to some related examples
16,17	Final Exams

Calculation of Course Workload			
Activities	Count	Time (Hour)	Total Workload (Hour)
Weekly classroom time	14	3	42
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)			
Project (Preparation and presentation time included)			
Presentation (Preparation time included)			
Mid-Term Exam	1	2	2
Studying for Mid-Term Exam	1	25	25
Final Exam	1	2	2
Studying for Final Exam	1	25	25
Total workload			138
Total workload / 30			4.6
Course ECTS Credit			5

Assessment	
Activity Type	%
Mid-term	40
Quiz	
Homework	
Bir öge seçin.	
Bir öge seçin.	
Final Exam	60
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	5
	d. Skill of applying all these knowledge and experience to complicated Electrical-Electronics engineering problems	
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.	5
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:	
	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	
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	
	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	

INSTRUCTORS

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Date:22.07.2024