ESOGÜ Electrical-Electronics Engineering Department

COURSE CODE:151228549 **COURSE TITLE:** ELECTRICAL MACHINERY

Semester	Weekly Hours		COURSE			
	Theoretical	Practical	Credits	ECTS	Type	Language
8	3	2	4	7	Compulsory ( ) Elective (x)	Turkish ( ) English (x)

Write the credit (for non-credit courses weekly hours) below (If necessary distribute the credits.).

Math and Basic Science	Electrical Engineering [mark (√) if there is high design content]	General Education	Humanities
	4 ( )		

Assessment	THEORETICAL-PRACTICAL COURSES			LABORATORY COURSES		
	Type	Number	%	Activity Type	Number	%
Midterm	Midterm	1	25	Quiz		
	Quiz	2	10	Lab performance		
	Homework			Report		
	Project			Oral exam		
	Other (Laboratory)	6	30	Other (……)		
Final		1	35			
Makeup exam (Oral/Written)	Oral					

Prerequisites	
Brief content of the course	Basic concepts of rotating machines. DC generators and motors. Induction motors. Synchronous generators. Special electrical machines. Experiments related with electrical machines will be carried out. Reports including operational characteristics of the generators and motors, and efficiency calculations will be prepared.
Objectives of the course	To learn the constructional features of electrical machines and the operational principles and characteristics of electrical machines used in industrial applications under varying load conditions. To know the solution methods in order to solve problems related with the electrical machines.
Contribution of the course towards professional education	In this course, students will be familiar with electrical generators and motors. They will also have sufficient theoretical information in order to analyze systems including electrical machines and they will learn the mechanisms which work the systems consisting other electrical machines and know practical applications of them.
Outcomes of the course	1- Students will learn the theory of electrical machines. 2- Students will analyze the electrical machines. 3- Students will solve the problems related with the electrical machines 4- Students will learn the structures of the electrical machines by observing them. 5- Students will investigate the operations of electrical machines under varying load conditions on the characteristics. 6- Students will learn the properties of the systems which work the electrical machines and they will be familiar with them.
Textbook of the course	A.E. Fitzgerald, C. Kingsley and A. Kusko, Electric Machinery, McGraw-Hill.
Other reference books	M. Kostenko and L. Piotrovsky, Electrical Machines. O.I. Elgerd, Basic Electric Power Engineering. Hindmarsh, Electrical Machines and Their Applications.
Required material for the course	

WEEKLY PLAN OF THE COURSE	
Week	**Topics**
1	Basic concepts of dc, induction and synchronous machines
2	Expression of voltages generated on dc and ac generators
3	DC generators(Lab:Investigation of the load characteristics of a dc shunt generator)
4	DC motors(Lab:Investigation of the load characteristics of a dc compound generator)
5	Speed control of dc motors
6	Constructional features and operational principles of induction machines(Lab:Investigation of the load characteristics of a dc shunt motor)
7	Derivation of equivalent circuit of induction machines(Lab:Investigation of the load characteristics of a dc compound motor)
8	Midterm
9	Midterm
10	Analysis of induction motors(Lab:Investigation of the load characteristics of squirrel cage induction motor)
11	Starting and speed control methods of induction motors(Lab:Investigation of the load characteristics of wound rotor induction motor)
12	Calculation of parameters in the equivalent circuit of synchronous machines
13	Regulation and efficiency in the synchronous machines
14	Special electrical machines
15,16	Final

Scale for assessing the contribution of the course to the program outcomes:

NO	OUTCOMES OF THE PROGRAMME	4	3	2	1
1	Adequate knowledge of mathematics, science and Electrical and Electronic Engineering; ability to practice theoretical and practical knowledge of these areas into modeling and solving complex problems of Electrical and Electronic Engineering		**x**		
2	Ability to identify complex engineering problems in Electrical and Electronic Engineering and related fields, for this purpose having skills to formulate, select and apply appropriate methods.		**x**		
3	Having skills to apply modern design methods to design a complex system, process, equipment or product that should work under realistic conditions and constraints and satisfy specific requirements concerning the Electrical and Electronic Engineering.				
4	Having skills to develop, select and apply modern techniques and tools needed to analyze and solve complex applications in Electrical and Electronic Engineering, skills to use information technology effectively.				
5	Skills to design and conduct tests, collect data, analyze results, and interpret data for the experimental investigation of complex problems in Electrical and Electronic Engineering		**x**		
6	Ability to function effectively as an individual and as a member of teams within the discipline and in multidiscipline areas.		**x**		
7	Communicating effectively in oral and written form both in Turkish and English. Effective report writing and understanding written reports, preparing design and manufacturing reports, making effective presentations, skills to give and receive clear and concise instructions.				
8	Awareness of the necessity of lifelong learning, access to information, monitoring developments in science and technology and the ability to self-renewing				
9	Understanding of professional and ethical responsibility				
10	Information on project management, change management and risk management practices, awareness on entrepreneurship and innovation, knowledge on sustainable development.				
11	Information about universal and societal effects of engineering applications on health, safety and environment; awareness of the legal consequences of engineering solutions.				

4: High **3: Medium** **2: Low** **1:None**

Name of Instructor(s): Prof. Dr. M. Bilginer Gülmezoğlu

Signature(s): **Date:**