ELECTRICAL MACHINES

1	Course Title:	ELECTRICAL MACHINES	
2	Course Code:	EEM4105	
3	Type of Course:	Optional	
4	Level of Course:	First Cycle	
5	Year of Study:	4	
6	Semester:	7	
7	ECTS Credits Allocated:	4.00	
8	Theoretical (hour/week):	2.00	
9	Practice (hour/week):	0.00	
10	Laboratory (hour/week):	2	
11	Prerequisites:	None	
12	Language:	Turkish	
13	Mode of Delivery:	Face to face	
14	Course Coordinator:	Öğr.Gör.Dr. SEVİM KURTULDU	
15	Course Lecturers:	-	
16	Contact information of the Course Coordinator:	E-posta:kurtuldu@uludag.edu.tr Tel: (224) 294 2021 Adres: Elektronik Mühendisliği Bölümü 1. Kat, No:109	
17	Website:		
18	Objective of the Course:	Aims of this course are acknowledgement of basic principles of magnetic fields and characteristics of magnetic materials; comprehension of structures, characteristics and applications of transformers, direct current machines, induction motors, synchronous machines and special electrical machines.	
19	Contribution of the Course to Professional Development:		
20	Learning Outcomes:		
		1	Ability to modeling basic magnetic structures.
		2	Ability to analyze magnetic circuit.
		3	Explain structure, working principle, characteristics and excitation types of direct current machines.
		4	Ability to modeling and analyze direct current machines.
		5	Recognize structure, working principle, characteristics and applications of synchronous machine.
		6	Recognize structure, working principle, characteristics and applications of induction motor.
		7	Recognize structure, working principle, characteristics and applications of step, servo and brushless DC motors.
		8	
		9	
		10	
21	Course Content:		

Course Content:

Week	Theoretical	Practice

1	Magnetic properties of matter: Bohr's atomic model. Magnetic dipole moment. Vector. Magnetic hysteresis. Magnetic energy and Coenergy.	
2	Magnetic Circuit Model: magnetic circuit axioms. Magnetomotive force, magnetic resistance, analysis.	
3	Single and three phase transformers: construction, equivalent circuit and steady state analysis.	Application examples in MATLAB.
4	Electromechanical conversion principles: Linear and Non-Linear systems. Actuators.	
5	Direct current machines: structure, working principle and the equivalent circuit.	
6	Direct current machines: the excitation types - Independent, Series, Shunt, and Kompund Machines.	
7	Direct current machines: Characteristics and performance analysis.	Application examples in MATLAB.
8	Direct current machines: speed control	Application examples in MATLAB.
9	Midterm Exam + Review of Past Lecturers	
10	The concept of induction. Rotating the magnetic field. Alternating current machines. Synchronous machines: structure, working principle and the equivalent circuit model.	
11	Synchronous machines: steady-state	Application examples in MATLAB.
13	Induction machines: steady-state analysis, and speed control.	
22	Textbooks, References and/or Other	1. "Electric Machinery", A. E. Fitzgerald, Jr. Charles

Activites	Number	Duration (hour)	Total Work Load (hour)
Theoretical	14	2.00	28.00
Practicals/Labs	14	2.00	28.00
Self study and preparation	14	3.00	42.00
Homeworks	1	14.00	14.00
Projects	0	0.00	0.00
Field Studies	0	0.00	0.00
Midterm exams	1	23.00	23.00
Others	0	0.00	0.00
Final Exams	1	30.00	30.00
Total Work Load			165.00
Total work load/ 30 hr			5.50
ECTS Credit of the Course			4.00

NY: McGraw-Hill, 1992. ISBN: 0070707708 3.

Güzelbeyoğlu, , Birsen Yayınevi, 2005.

Ongun.

MATLAB/SIMULINK", Chee Mun-Ong,2006.

TERM LEARNING ACTIVITIES	NUMBER	WEIGHT
Midterm Exam	1	20.00
Quiz	0	0.00
Home work-project	1	30.00
Final Exam	1	50.00
Total	3	100.00
Contribution of Term (Year) Learning Activities to Success Grade		50.00
Contribution of Final Exam to Success Grade		50.00
Total		100.00
Measurement and Evaluation Techniques Used in the Course		

24	ECTS / WORK LOAD TABLE

25	CONTRIBUTION OF LEARNING OUTCOMES TO PROGRAMME QUALIFICATIONS															
	PQ1	**PQ2**	**PQ3**	**PQ4**	**PQ5**	**PQ6**	**PQ7**	**PQ8**	**PQ9**	**PQ10**	**PQ11**	**PQ12**	**PQ13**	**PQ14**	**PQ15**	**PQ16**
ÖK1	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ÖK2	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ÖK3	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ÖK4	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ÖK5	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ÖK6	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ÖK7	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LO: Learning Objectives PQ: Program Qualifications																
Contribution Level:	**1 very low**		**2 low**			**3 Medium**			**4 High**			**5 Very High**				