	Course name: EE320 Electromechanical Energy Conversion II		**Department:** Electrical and Electronics Engineering			Semester
						5
	Methods of Education					Credit (ECTS)
	Lecture	Study Time	Homework	Exam (incl. Preparation)	Total	5
	42	38	30	30	140	

Language	English
Compulsory/Elective	Restricted Elective
Prerequisites	EE319
Course Contents	Electromagnetic fields created by AC electric machine windings: pulsating and rotating magnetic fields, EMF induced in a winding. Three-phase induction machines: equivalent circuit, steady-state analysis. DC machines (Generators and Motors): equivalent circuit, steady-state analysis.
Course Objective	- Students will be able to comprehend the methods for the generation of sinusoidal voltages in AC machines. - Students will be able to analyze, control and operate three phase induction machines. - Students will be able to analyze, control and operate DC motors - Students will be able to analyze, control and operate DC generators
Learning Outcomes and Competences	**Students who pass the course will be able to:** - Use of AC power in power systems in three phase form with sinusoidal voltages changing at 50/60 Hz - Understand sinusoidal voltage generation methods in AC machines with uniform and non-uniform forms. - Know per phase equivalent circuit in the steady state of Induction and DC machines. - Sketch power flow diagram and efficiency of AC and DC machines. - Learn steady state analysis by the use of equivalent circuit: current, electromechanical torque, gross mechanical output power. - Understand equivalent circuit and electromechanical torque of AC and DC machines.
Textbook and /or References	1- ELECTRIC MACHINERY FUNDAMENTALS, 5th EDITION, Stephen J. Chapman 2- E. Fitzgerald, Charles Kingsley, Jr., and Stephen D. Umans, Electric Machinery, Sixth Edition, McGraw-Hill, 2003.

Assessment Criteria		If any, mark as (X)	Percentage (%)
	Midterm Exams	X	30
	Quizzes		
	Homework	X	10
	Projects		
	Term Paper		
	Laboratory work		
	Other		
	Final Exam	X	60
Instructors	Prof. Dr. Ahmet KARAARSLAN		

Weekly Schedule

Week	Subject
1	Introduction – Fundamentals of AC Machines
2	Fundamental of Three Phase Induction Generators
3	Equivalent Circuit Analysis of Three Phase Induction Generators
4	Phasor diagram of Three Phase Induction Generators
5	Fundamental of Three Phase Induction Motors
6	Equivalent Circuit Analysis of Three Phase Induction Motors
7	Phasor diagram of Three Phase Induction Motors
8	Phasor diagram of Three Phase Induction Motors
9	**Mid-term Exam**

10	DC Machinery Fundamentals
11	Equivalent Circuit Analysis of DC Motors
12	Series/Shunt/Compound DC Motors
13	Equivalent Circuit Analysis of DC Generators
14	Series/Shunt/Compound DC Generators
15	Control Methods of AC and DC Machines