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Department of Electrical Engineering	
Electrical Machines II (63324)	
Total Credits	**3**
major compulsory	
Prerequisites	P1 : Electrical Machines I (63323) OR Electrical Machines I (63371)

Course Contents

AC machinery fundamentals. Synchronous generators. Synchronous motors. Induction motors. Single phase and special purpose motors.

	Intended Learning Outcomes (ILO's)	Student Outcomes (SO's)	Contribution
1	The student should be able to understand the principle of action of AC machines.	A	30 %
2	The student should be able to learn different characteristics of AC machines to control them.	E	30 %
3	The student should be able to solve practical and design perspective problems related to AC machines.	B	40 %

Textbook and/ or Refrences

Electric machinery fundamentals. Stephen J. Chapman. McGraw-Hill. &Electric machinery. A.E.Fitzgerald, Charles Kigsley, and A. Kusko. McGraw-Hill.

Assessment Criteria	Percent (%)
First Exam	20 %
Second Exam	20 %
Homeworks	10 %
Final Exam	50 %

Course Plan

Week	Topic
1	AC MACHINERY FUNDAMENTALS: The rotating magnetic field. Magnetomotive force and flux distribution in AC machines. Induced voltage in AC machines.
2	CONSTRUCTION OF AC MACHINES: The effect of coil pitch on AC machine stators. Distributed windings. Induced torque. Solving different problems.
3	SYNCHRONOUS GENERATORS: Construction. The concept of synchronous speed. The internal generated voltage. The equivalent circuit. Phasor diagrams. Power and torque in synchronous generators.
4	OPERATION OF SYNCHRONOUS GENERATORS: The synchronous generator operating alone. Parallel operation of synchronous generators. Solving different problems.
5	OPERATION OF SYNCHRONOUS GENERATORS: The synchronous generator operating in parallel with an infinite bus, and in parallel with a generator of the same size. The synchronous generator capability curve and ratings. Solving different problems.
6	MIDTERM EXAM 1
7	SYNCHRONOUS MOTORS: Basic principles of motor operation. Steady- state synchronous motor operation.
8	SYNCHRONOUS MOTORS: Starting synchronous motors. Synchronous motors ratings. Solving different problems.
9	INDUCTION MOTORS: Construction. The equivalent circuit. Power and torque in induction motors.
10	INDUCTION MOTORS OPERATION: Induction motor torque-speed characteristics.

	Starting of induction motors. Speed control. Solving different problems.
11	INDUCTION MOTORS OPERATION: Determining of the circuit model parameters of the induction motor. The induction generator . Induction motor ratings. Solving different problems.
12	MIDTERM EXAM II
13	SINGLE PHASE MOTORS: Single phase induction motors. Speed control. The circuit model.
14	SPECIAL PURPOSE MOTORS. COURSE REVIEW.