

Department of Electrical Engineering			
Electrical Machines Lab. (63392)			
Total Credits	1		
major compulsory			
Prerequisites	P1 : Electrical Machines (67316) OR Electrical Machines (63391) OR Electrical Machines (65370)		
Course Contents			
1- Phasor diagram and efficiency test of 1-phase transformer 2- DC separately excited & series generator (characteristics, voltage reg. & efficiency) 3- Open circuit test & short circuit test of 1-phase transformer 4- DC shunt and compound generator (characteristics, voltage reg. & efficiency) 5- DC shunt and compound motor (characteristics, speed reg. & efficiency) 6- 3-phase transformer (balance & unbalanced RLC load, characteristics, phase sequence) 7- 3-phase synchronous generator (wye & delta connections) 8- 3-phase squirrel-cage induction motor (wiring, characteristic, operation, efficiency) 9- 3-phase slip-ring induction motor (characteristics) 10- 3-phase synchronous motor (characteristics, under excited & over excited) 11- 1-phase induction motor capacitor run & capacitor start motor 12- 1-phase generator synchronized with the mains supply (conditions of parallel operation)			
Intended Learning Outcomes (ILO's)		Student Outcomes (SO's)	Contribution
1	Ability to implement, verify and operate AC & DC rotational machines. In addition to gain the necessary understanding of their electrical characteristics	A	20 %
2	Ability to relate the theoretical aspects of various electrical machines with their practical characteristics and behaviors	D	15 %
3	To become Familiar with the measurements of voltage, current, power, torque & speed	B	25 %
4	Ability to implement and test various electrical machine circuits	C	15 %
5	Knowing how to author a good technical report taking into consideration that the following elements. Such as, paragraph, calculation, results and conclusion are all available	C	25 %
Textbook and/ or References			
Electrical Machines Lab Authors: O. Tamimi Electric Machinery Fundamentals Fourth Edition Stephen Chapman			
Assessment Criteria		Percent (%)	
Projects		10 %	
Reports		40 %	
Laboratory Work		25 %	
Final Exam		25 %	
Course Plan			
Week	Topic		
1	Phasor diagram and efficiency test of 1-phase transformer		
2	DC separately excited & series generator (characteristics, voltage reg. & efficiency)		
3	Open circuit test & short circuit test of 1-phase transformer		
4	DC shunt and compound generator (characteristics, voltage reg. & efficiency)		
5	DC shunt and compound motor (characteristics, speed reg. & efficiency)		
6	3-phase transformer (balance & unbalanced RLC load, characteristics, phase sequence)		
7	3-phase synchronous generator (wye & delta connections)		

8	3-phase squirrel-cage induction motor (wiring, characteristic, operation, efficiency)
9	3-phase slip-ring induction motor (characteristics)
10	3-phase synchronous motor (characteristics, under excited & over excited)
11	1-phase induction motor capacitor run & capacitor start motor
12	1-phase generator synchronized with the mains supply (conditions of parallel operation)