Course Name Electrical Machine Design-I

Course Code EE581

Course Credit 2

Contact Hour 1L-3P

Prerequisite Concept of Resistance, Inductor, Capacitor, Magnetic Circuit

Course Objective

The objectives of this course are

1. Ability to understand the various parts and performance of Machines.
2. Ability to design and estimate for a particular machine.
3. Ability to design magnetic circuit of machines and performance and characteristics study.

Course Outcome

On completion of the course students will be able to

1. Gain the knowledge of various parts of a electrical machine.
2. Develop knowledge helpful for PhD
3. Conduct open circuit/ short circuit test on transformer
4. Conduct experiments on Ac Machines to find the characteristics.
5. Calculate torque and speed of designed Machine.
6. Design circuits as per theoretical problem and test the efficiency.

CO Mapping with departmental POs

H: High, M: Medium, L: Low

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
CO 1	H				M							
CO 2			M		M				L		L	
CO 3		H	H							M		
CO 4		H										
CO 5		M										
CO 6		H	M	H	M			M		L	M	

Course Content

Fundamental Aspects of Electrical Machine Design:

Design factors, limitation in design, modern trends in design of electric machines, modern machine manufacturing techniques. Temperature rise, cooling and thermal grading (classification) of insulations.

Design of Resistances:

Material of resistance elements, design of loading rheostat, design of heating element.

Principles of Magnetic circuit design:

Magnetic leakage, calculation of total mmf in a magnetic circuit, determination of iron losses, pulsation losses, magnetic leakage calculations, specific permeance, leakage reactance, armature leakage, slot leakage, calculation of magnetizing current.

Design of Electromagnets:

Design of Electromagnet core, selection of materials, electromagnet coils.

Design of Power Inductors:

Inductor design calculations choke (small inductors), design procedure

Text Books:

1. Electrical Machine Design by Sawhney and Chakraborty.