

Course Contents:

Unit 1: AC- and Magnetic-Circuits

Representation of sinusoidal waveforms, peak and rms values, phasor representation, real power, reactive power, apparent power, power triangle, power factor.

Three-phase balanced circuits, voltage and current relations in star and delta connections.

Production of Magnetic Field, Magnetic Circuits.

Unit 2: Transformers

Construction and working of ideal and practical transformers, equivalent circuit model, losses in transformers, voltage regulation and efficiency.

Auto-transformer and three-phase transformer connections.

Unit 3: AC Machines (Synchronous & Induction Machines)

Fundamentals of ac-machines: Induced voltage and torque, Rotating magnetic field.

Synchronous Generator: Construction, working principle, speed of rotation, internal generated voltage, equivalent circuit model and phasor diagram.

Single-phase Induction Motor: Construction, working principle, equivalent circuit model, torque-speed characteristics, speed control.

Unit 4: DC Machines

Fundamentals of dc-machines: Induced voltage and torque, Armature winding and Commutator.

DC Motor: Construction and working principle, equivalent circuit model, separately excited and shunt dc-motor.

Text / Reference Books:

1. S. J. Chapman, "Electric Machinery Fundamentals, 4th Edition, McGraw Hill Education.
2. D. P. Kothari and I. J. Nagrath, "Electrical Machines", 4th Edition, Tata McGraw Hill.

Course Evaluation Plan:

S. No.	Exam	Duration	Weightage	Contents
1.	Quiz (weekly)	10 mins.	25%	Topics covered during the week.
2.	Mid-Semester	2 hrs.	30%	Topics covered up to the exam date. (Up to the last lecture before the exam date.)
3.	End-Semester	3 hrs.	45%	Entire topics covered during the semester. (The exam paper consists of 60% questions from the topics covered after In-Semester-II and 40% questions will be from the rest topics.)