

Prof Incharge: Bhuvaneshwari, IITD

Topic Name: Transformer

Relevant Course: Electrical Machines

Relevant Department: Electrical Engineering

Relevant Semester:

Topic Description and Outline:

Session 1: Basic configuration, construction - types, principle of operation, Amp-Turn balance, Ideal transformer, Accounting for core losses - Eddy current and hysteresis losses, revisiting construction - reduction of eddy current losses with laminations; magnetizing current and magnetizing reactance; some worked examples

Session 2: Copper losses, leakage reactances - reducing leakage in a transformer; Equivalent circuit of a transformer, transferring values from primary to secondary side and vice-versa. Efficiency and voltage regulation in a transformer; OC and SC tests ; some worked examples

Session 3: Phasor diagrams of transformers; Auto-transformer and its applications; audio frequency transformers, current transformers and voltage transformers. Power and Distribution transformers; all-day efficiency.

Pre- requisites: Basics of Electric and magnetic circuits. MMF, Flux, Reluctance and Faraday's law of electro-magnetic induction. (These can be read from "Electrical Technology" by Edward Hughes, Pearson education)