ELECTRICAL MACHINES II (THEORY) EE-301

Pre-requisite: Electrical Machines - I
Credit Hours 03
Contact Hours 48

RECOMMENDED BOOKS

- U A Bakshi, M. V. Bakshi, Electrical Machines-II, 2009, Technical Publications India,
- B. L. Theraja, A. K. Theraja, A Text Book of Electrical Technology, ISBN-13: 978-8121924412

REFERENCE BOOKS

- Stephen J. Chapman, "Electric Machinery Fundamentals," Fourth Edition, 2005, McGraw-Hill, ISBN: 0072465239

OBJECTIVE OF COURSE

This course includes AC machines fundamentals and production of rotating magnetic field. In this course working principles, construction, characteristics and equivalent circuit of three phase synchronous generators, synchronous motor, induction motors and Three phase transformers are discussed in detail.

S.NO	CLO/PLOs MAPPING	DOMAIN	PLO
01	**Explain** operating principles of fundamental components of AC Machines: motors, generators and three phase transformers.	C2	01
02	**Explain** construction, working principles, characteristics and equivalent circuit of three phase synchronous generators, synchronous motors and induction motors.	C2	02
03	**Analyze** Construction of Three phase transformers and different connections in which they can be connected along with their application.	C4	02

COURSE CONTENTS

Synchronous Generators (Alternators)

- Working principle

- Stationary armature
- Salient-pole type and smooth cylindrical type alternators
- EMF equation
- Voltage regulation
- Excitation system
- Synchronous reactance
- Synchronization and Parallel operation

Three-phase Induction motors
- Rotating magnetic field (R.M.F)
- Construction
- Working principle
- Slip and its effects
- Torque equation
- Induction motor as transformer
- Torque-slip and speed-torque characteristics
- Speed Control and Starters

Three-phase Transformers
- Connection Types
    - Star-Star
    - Star- Delta
    - Delta-Star
    - Delta-Delta
    - V-V
- Voltages and Current relationships for different connections

Synchronous motors
- Construction and Operation

- Starting and Methods of starting
- Induced Emf
- Power flow
- Comparison of Synchronous and Induction motors
- Hunting