

GUJARAT TECHNOLOGICAL UNIVERSITY

B. E. SEMESTER: V

Electrical Engineering

Subject Name: **Electrical Machine-II**

Subject Code: **150901**

Teaching Scheme				Evaluation Scheme		
Theory	Tutorial	Practical	Total	University Exam (Theory) (E)	Mid Sem Exam (Theory) (M)	Internal Assessment (I)
3	0	2	5	70	30	50

Sr. No	Course content
1.	Polyphase Transformer: Polarity, Star/star, Star/delta, Delta/delta, delta/zigzag, terminal marking, Nomenclature, Vector diagram, Phase groups, Parallel operation, Scott connection, V-V connections tertiary winding, Testing of transformers, Sumpner's test - efficiency - transients in transformers - voltage regulation - off load and on load tap changers. Concept of Welding transformer, Rectifier transformer & High frequency transformer.
2.	Polyphase Induction Motor: Introduction, No-load & blocked rotor test, equivalent circuit, Phasor diagram, Circle diagram, Efficiency and slip scale with the help of circle diagram, Analogy of an I.M. to a transformer, Effect of rotor resistance on performance of I.M., Double cage squirrel cage IM and its equivalent circuit, Induction machine dynamics. Starters of I.M Principles & Methods of speed control of 3- phase I.M. , Electrical transients in induction machine, Magnetic levitations, Principle, advantages & application of linear induction motor, Effect of harmonics, Harmonic torques, Cogging & Crawling, effect of unbalance voltages & frequency variation on operation of I..M. Testing of induction motor as per IS, Energy efficient motors.
3.	Induction Generator, Principle of operation and application, Its load and p. f. control,
4.	Single phase A. C. motors: Types of single phase motors, Principle and operation of split phase, Resistance start, Capacitor start and capacitor start & run induction motor, Shaded pole induction motor, Fractional horse power motors, Double field revolving theory, Equivalent circuit of 1-phase induction motor, Starting & running performance of 1-phase induction Motor, Losses and efficiency.

5.	Commutator motors: Action of commutator as a frequency converter, Construction and principles of following commutator motors: Repulsion motor, Schrage motor, AC series motor, Universal motor.
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Reference Books:

1. Electrical Machines, by Nagarath & Kothari Tata Macgraw hill Pub.
2. Electrical Machines by J. B. Gupta, (S.K.Kataria & Sons).
3. Electrical Technology Vol II. B. L. Theraja. S chand publication.
4. Electrical Machines by P S Bhimbhra, Khanna Pub.
5. Performance and Design of A.C. machines by M. G. Say,CBS pub.
6. Electrical machine Drives and Power System by Wildi ,6th Edition, Pearson Publications.