

GUJARAT TECHNOLOGICAL UNIVERSITY

B. E. SEMESTER: V

POWER ELECTRONICS ENGINEERING

Subject Name: **Electro Mechanical Energy Conversion-II**

Subject Code: **152404**

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

Sr. No.	Course Content
1	Three phase Transformer: Construction of 3 – Ø transformer-Application-Merits of 3 – Ø transformer- 3 – Ø transformer connections - Scott connection - parallel operation of 3 – Ø transformer-harmonics in transformer.
2	Single Phase Induction motor : Types of single phase motor - revolving field theory-starting and running performance of single phase IM –Split Phase Motors – Capacitor Type Motor – Shaded Pole Induction Motor – Self Starting Synchronous Reluctance Motor- Hysteresis Motor – AC series Motor – Universal Motor – Speed Control of Universal Motors-Equivalent circuit of single phase Induction Motor.
3	Synchronous Motor: Construction – principle of operation – Starting of synchronous motors. – Motor on load with constant excitation and different excitation - Equivalent circuit –Power developed by a synchronous motor – Effect of Excitation on Armature Current and Power Factor-Constant Power Lines – Construction of V curves - Speed Control of Synchronous Motor - Synchronous motor application.
4	Unbalanced Operation of Polyphase Induction Motor: Unbalanced condition-positive negative and zero sequence response-single phasing-operation on non sinusoidal voltage –Equivalent Circuit – Blocked Rotor Test – No load Test - Dynamic Performance.
5	Magnetic Material : Magnetic Material –Types of magnetic material –Properties of Magnetic Material – Permanent magnet materials –Application of Permanent magnet material - magnetic circuits.

6	Advanced Electrical Machine : permanent magnet brushless dc machine : construction operation, performance, control and applications - permanent magnet brushless ac motor- stepper motors- Switched Reluctance Motor: Construction, operating performance, control and applications - Linear Induction Machines and Linear Synchronous Machines: Construction, operation, performance, control and applications
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Reference Books:

1. Electrical Machinery : A.E. Fitzgerald, Charles Kingsley, Stephen D. Umans,
2. Electrical Machine: S Bhattacharya
3. Electric Machines: I.J. Nagrath, D.P. Kothari
4. Electrical Technology II : B.L. Thereja
5. Performance and Design of A.C. Machines: M. G. Say
6. Theory of Alternating Current Machinery: A. S. Langsdorf
7. Electrical Machine: Charles A. Gross