

GUJARAT TECHNOLOGICAL UNIVERSITY

ELECTRICAL ENGINEERING

B. E. SEMESTER: VII

Subject Name: **Inter Connected Power System**

Subject Code: **170901**

Teaching Scheme				Evaluation Scheme			
Theory	Tutorial	Practical	Total	University Exam (E)		Mid Sem Exam (Theory) (M)	Practical (Internal)
				Theory	Practical		
3	0	2	5	70	30	30	20

Sr. No.	Course Contents	Total Hrs
1.	Introduction: Concept of Interconnection, Hierarchical Grid arrangements, Cascade Tripping, Islanding, Load dispatch centre	04
2.	Power system matrices Brief explanation of Graph theory, Primitive Network, Ybus formation methods, Singular transformation method, Direct method, Algorithm for formation of Zbus, Addition branch and link, Removal of elements, Numerical	08
3.	Load flow studies Introduction, Static Load Flow Equations, Bus Classifications, Approximate method, Gauss-Seidel Method, Newton Raphson Method, Fast Decoupled Load Flow Method, Comparison of different methods, Numerical	10
4.	Economic operation of power systems Generator operating cost, Economic operation of generators within thermal plant, Optimal operation by co-ordination equation, Penalty factor, Derivation of transmission loss formula (Kron's method), Unit commitment problem solution by dynamic programming, Numerical	04
5.	Frequency and voltage control methods Speed governing mechanism, Mathematical modelling, Adjustment of Governor characteristics, Single area control, Flat frequency control, Selective frequency control, Tie line load bias control, Methods of voltage control, Numerical	06

6.	Power system stability Introduction, Classification of stability studies, concept of load angle and infinite bus, Power angle curve, Swing equation, Solution of swing equation, Steady state stability analysis, Methods of improving Steady state stability , Transient stability analysis, step by step method, Methods of improving Transient stability, Equal area criteria, Single Machine infinite bus stability studies, Numerical	10
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Reference Books:

1. Modern Power System Analysis by D. P. Kothari & I. J. Nagrath, Tata- McGraw-Hill
2. Power System Analysis by John J. Grainger & Jr. Stevenson, Mcgraw-Hill
Power System Analysis by Hadi Saadat, Tata-McGraw-Hill
3. Electrical Power Systems by C. L. Wadhwa, New Age International
4. Power System Analysis by T. K. Nagsarkar & M. S. Sukhija, Oxford University Press