C.U.SHAH UNIVERSITY

FACULTY OF: - Technology & Engineering
DEPARTMENT OF: -Electrical Engineering
BRANCH: Electrical & Electronics Engineering
SEMESTER: - VII
COURSE:- B.Tech
CODE: - 4TE07ICP1
NAME –Inter Connected Power System

Teaching & Evaluation Scheme

Subject Code	Name of the Subject	Teaching Scheme (Hours)				Credits	Evaluation Scheme							
							Theory				Practical (Marks)			Total
		Th	Tu	Pr	Total		Sessional Exam		University Exam		Internal		University	
							Marks	Hrs	Marks	Hrs	Pr/Viva	TW	Pr	
4TE07 ICP1	Inter Connected Power System	3	0	2	5	4	30	1.5	70	3	--	20	30	**150**

Objectives

- To study various Electrical advance Electrical Power systems, economical, frequency control machines power plant economic analysis.
- To study design and implementation of modelling of Turbine Speed-Governor Controller
- To study design and simulation of Advance machines

Prerequisites

- Basics and fundamental electrical advance and modern machine power system and analysis.

Course Outlines

Sr. No.	Course Contents	Hours
1	**Introduction:** Concept of Interconnection, Hierarchical Grid arrangements, Cascade Tripping, Islanding, Load dispatch centre	08
2	**Economic Operation of Power System:** Introduction, Characteristics of Thermal Units, Objective Function and Constrains for the Economic Dispatch Problem, Lagrange Multiplier Method – An Overview, Economic Dispatch Problem- Neglecting Transmission Line Losses **Economic Operation of Power System**: Introduction, Economic Scheduling Problem Considering Losses, Derivation of the Transmission Loss Formula, Solution of the Economic Scheduling Problem – Considering Transmission Line	14

	Losses, Economic Dispatch Considering Losses- The Classical Method **Hydro Thermal Scheduling**: Introduction, Long Range Hydro Thermal Scheduling.	
3	**Modeling of Turbine, Generators and Automatic Controllers:** Introduction, Modelling of Turbine Speed-Governor Controller, Modelling of Steam Turbine, Generator Load Model, Representation of Loads, Turbine Model, Synchronous Machines, The Swing Equation, Excitation, Excitation Controller Modelling.	10
4	**Frequency and Voltage Control Methods:** Mathematical Modeling, Adjustment of Governor characteristics, Single area control, Flat frequency control, Selective frequency control, Tie line load bias control, Methods of voltage control, Numerical **Single Area Load Frequency Control**: Introduction, Control Area Concept, Isolated Block Diagram Representation of Single Area Frequency Control, Steady State Response, State Space Model for Single Area, Matrix Representation of all State Equations. **Two-Area Load Frequency Control:** Load frequency Control of Two-Area System, Two Area State Space Model Representation, Steady State Analysis. **Load Frequency Controllers:** Introduction, Proportional Plus Integral Controller, Load Frequency control and Economic Dispatch Control.	14

Learning Outcomes

The students would be able to design and implement various Introductions to mathematical computational and simulation software in electrical power system analysis. Solved frequency and voltage control analysis for power plant and system analysis.

Books Recommended

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, Tata- McGraw-Hill
3. "Power System Analysis: by Hadi Saadat, Tata-McGraw-Hill
4. "Electrical Power Systems" by C. L. Wadhwa, New Age International
5. "Power System Analysis" by T. K. Nagsarkar & M. S. Sukhija, Oxford University Press