

GUJARAT TECHNOLOGICAL UNIVERSITY

BRANCH NAME: ELECTRICAL ENGINEERING
SUBJECT NAME: ELECTRIC POWER DISTRIBUTION SYSTEM
SUBJECT CODE: 3710720
M.E. 1st SEMESTER

Type of course: Programme Elective II

Prerequisite: Basic courses on Power systems

Rationale: The distribution power has been into focus since long. Due to the advent of computers, communication and other technologies the distribution of power has become much better than earlier years. The deregulation and energy efficiency has driven the new developments into the field of power distribution. The management of power distribution, development of infrastructure of distribution systems, operation of distribution systems and maintenance of automated distribution systems has gained focus in recent years.

Teaching and Examination Scheme:

Teaching Scheme			Credits C	Examination Marks				Total Marks
L	T	P		Theory Marks		Practical Marks		
			ESE(E)	PA (M)	PA (V)	PA (I)		
3	0	2	4	70	30	30	20	150

Content:

Sr. No.	Content	Total Hrs	% Weightage
1	Distribution of Power, Management, Power Loads, Load Forecasting Short-term & Long-term, Power System Loading, Technological Forecasting.	8	
2	Advantages of Distribution Management System (D.M.S.) Distribution Automation: Definition, Restoration / Reconfiguration of Distribution Network, Different Methods and Constraints Power Factor Correction	8	
3	Interconnection of Distribution, Control & Communication Systems, Remote Metering, Automatic Meter Reading and its implementation	7	
4	SCADA: Introduction, Block Diagram, SCADA Applied to Distribution Automation, Common Functions of SCADA, Advantages of Distribution Automation through SCADA	7	
5	Calculation of Optimum Number of Switches, Capacitors, Optimum Switching Device Placement in Radial, Distribution Systems, Sectionalizing Switches – Types, Benefits, Bellman's Optimality Principle, Remote Terminal Units, Energy efficiency in electrical distribution & Monitoring	6	
6	Maintenance of Automated Distribution Systems Difficulties in Implementing Distribution. Automation in Actual Practice, Urban/Rural Distribution, Energy Management, AI techniques applied to Distribution Automation	6	

Reference Books:

1. A.S. Pabla, “ Electric Power Distribution”, Tata McGraw Hill Publishing Co. Ltd., Fourth Edition.
2. M.K. Khedkar, G.M. Dhole, “A Text Book of Electrical power Distribution Automation”, University Science Press, New Delhi
3. Anthony J Panseni, “Electrical Distribution Engineering”, CRC Press
4. James Momoh, “Electric Power Distribution, automation, protection & control”, CRC Press

Course Outcome:

After learning the course the students should be able to:

1. Knowledge of power distribution system
2. Study of Distribution automation and its application in practice
3. To learn SCADA system
4. To learn about maintenance of automated systems

List of Experiments:

Practicals/experiments/simulations shall be based on above topics

Major Equipment: ----**List of Open Source Software/learning website:**

- E-materials available at the website of NPTEL- <http://nptel.ac.in/>
- MATLAB (Trial version): Software is useful for simulation and analysis of electrical systems