

**M.TECH SECOND SEMESTER
DISTRIBUTION SYSTEM PLANNING & AUTOMATION**

17EEPC2T4

Lecture: 4 periods/week

Credits: 4

Internal Assessment: 40 marks

End Semester Assessment: 60 marks

Course Objective:

This subject deals with the distribution system planning and distribution automation with the implementation of SCADA, along with the substation/feeder Automation.

Course Learning Outcomes: At the end of the course the student will be able to

1. Know different planning models in the distribution system planning.
2. Understands the need and benefits of Distribution Automation (DA) along with the communication requirements.
3. Know the importance of SCADA system in distribution automation.
4. Understands monitoring of substation, able to reduce the losses and improves the voltage profile.

UNIT-I: DISTRIBUTION SYSTEM PLANNING

Introduction, Distribution system Planning, Factors effecting planning, Present techniques, Planning models, planning in the future, Future nature of distribution planning, Role of computer in Distribution planning, Short-Term Load Forecasting, Long-Term Energy Forecasting, Technological Forecasting

UNIT-II: DISTRIBUTION AUTOMATION

Basic Distribution Systems, Problems of existing Distribution System, Need for Distribution Automation, Characteristics of Distribution System, Distribution Automation (Objectives, Functions, Benefits), Communication Requirements for DA, Remote Terminal Unit (RTU), Communication Technologies for DA.

UNIT-III: SCADA SYSTEM

Introduction, Block Diagram, Components of SCADA, Functions of SCADA, SCADA applied to Distribution Automation, Advantages of DA through SCADA, Requirements and Feasibility, DA Integration Mechanisms, Communication Protocols in SCADA Systems.

UNIT-IV: SUBSTATION AUTOMATION

Introduction, Functions of Substation Automation System, State and Trends of Substation Automation, Intelligent Affordable Substation Monitoring and Control

Feeder Automation: Losses in Distribution Systems, Loss Reduction, Network Reconfiguration, Improvement in Voltage Profile, Capacitor Placement in Distribution System for Reactive Power Compensation, Algorithm for location of capacitor.

TEXT BOOKS:

1. Dr M K Khedkar and Dr G M Dhole, "A Textbook of Electric Power Distribution automation", University Science Press, 2011.
2. Electric Power Distribution system Engineering by Turan Gonen, CRC press, 3rd edition, 2014.

REFERENCE BOOKS:

1. Electric Power Distribution by A.S. Pabla, Tata Mc Graw-hill Publishing Company, 6th edition, 2011.
2. Control and Automation of Electrical Power Distribution systems by James Northcote and Robert Wilson, CRC press, special Indian edition.