C.U.SHAH UNIVERSITY – Wadhwan City

FACULTY OF: -Technology and Engineering
DEPARTMENT OF: -Electrical Engineering
SEMESTER: - IV **CODE**: - 2TE04TDE1
NAME – Transmission and Distribution of Electrical Power (TDE)

Teaching & Evaluation Scheme:-

Subject Code	Subject Name	Teaching Scheme (Hours)				Credits	Evalution Scheme							
							Theory				Practical (Marks)			Total Marks
							Sessional Exam		University Exam		Internal		University	
		Th	Tu	Pr	Total		Marks	Hours	Marks	Hours	Pr	TW	Pr	
2TE04TDE1	Transmission and Distribution of Electrical Power (TDE)	3	0	2	5	4	30	1.5	70	3	30	20	-----	150

Objectives:-

- To Developed The Basic Knowledge Of Transmission System & Distribution System.
- Identify Various Components of Substation.
- Types and Function of Different Types of Cables.

Prerequisites: - Basic knowledge of generation system.

Course Outlines:-

Sr. No.	Course Contents	No Of Hours
1	**Transmission Line Components:-** Introduction To Transmission, Necessity of Transmission of Electricity, Classification & Comparison of Different Types of Transmission Systems Introduction To Line Components, Types of Conductors-Copper, Aluminum & State Their Trade Names, Solid, Stranded & Bundled Conductors Line Supports – Requirements, Types, And Field of Applications, Failure of Insulator & Reasons Of Failure, Distribution of Potential Over A String of Suspension Insulators, Concept of String Efficiency, Methods of Improving String Efficiency, Corona – Corona Formation, Advantages & Disadvantages, Factors Affecting Corona, Important Terms Related To Corona, Spacing Between Conductors.	6
2	**Transmission System:-** Layout & Introduction of Power System, Systems of Transmission, Overhead Line Supports and Insulators, Design of Overhead Transmission Line With Equal Supports, Effect of Voltage On Transmission Efficiency, Line Regulation and Volume of Conductor Materials and Selection of Economical Transmission Voltage, Sag Calculations, Performance of Short and Medium Transmission Lines (T And Π Method), Layout of Control Room and Its Equipment At Power Station, Layout And Equipment of Switchyard At Power Station, Sharing of Load Through Load Dispatch Centre, Importance of PLCC In Power Transmission, Comparison of Transmission System, Operational Aspects of H.V.D.C. Transmission, Schematic Arrangement With Converting and Inverting Equipment.	6

3	**Performance of Transmission Line:-** Skin Effect, Proximity Effect & Ferranti Effect, Concept of Transposition of Conductors & Its Necessity, Classification of Transmission Lines, Losses, Efficiency & Regulation of Line, Performance of Single Phase Short Transmission Line, Effect of Load Power Factor On Performance, Medium Transmission Lines-End Condenser, Nominal T & Nominal Pi Network With Vector Diagram, Compensation of Transmission Lines- (Introduction Shunt-Series).	6
4	**Distribution System:-** Position of Distributor In Supply System, Primary & Secondary Distribution System, Feeder, Distributor, Service Mains, Methods of Feeding Distributor, Three Phase Three Wire And Three Phase Four Wire System, A.C. Distribution Calculations—Methods of Solving A.C. Distribution Problems, Simple Calculations of Feeders Fed At One End And Two Ends and For Closed Loop Simple Network, I.E Rules for Releasing New Service Connections, Types of D.C. Distributors, D.C. Distributor Fed At One End – Concentrated Loading, Uniformly Loaded Distributor Fed At One End, Distributor Fed At Both Ends –Concentrated Loading, Uniformly Loaded Distributor Fed At Both Ends, Distributor With Both Concentrated and Uniform Loading, Ring Distributor	8
5	**EHV Transmission:-** Introduction & Requirement of EHV Transmission, EHV AC Transmission, Reasons For Adoption & Limitations, HVDC Transmission – Advantages, Limitations, Introduction, Requirements of FACTS Devices, Classification Of FACTS Devices.	8
6	**Cables:-** Compression of Overhead Line & Underground Cable, Classification of Cables Normally Used In Distribution System, Construction of Cables, Types of Cable, Heat Produced In Cable, Conduction of Heat, Methods of Laying Cable, Selection of Cables As Per IS /Data Sheet / Catalogue.	6
7	**Substation:-** Functions of Substations, Types of Substation, Equipment And Layout of Substation, Control Equipment In Substation, Points To Be Considered for Location of Substation, Lay Out of Substation, Bus bar Arrangement, Key Diagram of Different Substation, Pole Mounted Substation	8

List of Experiments:-

- Solve The Problem To Find Out Constants of Transmission Line for Given Data
- Solve Problems On String Efficiency.
- Solve Problems On Sag
- Calculate The Voltage To Be Maintained At The Feeding End of A Distributor Loaded At Two Points Along Its Length
- Prepare Technical Report After Visiting A Substation
- Visit to Nearby Cable Industries And Classify Cables Normally Used In Power System
- Classify The Different Types of Distribution System.
- Solve The Numerical Based On Single Phase Distribution System
- Solve The Numerical Based On Performance of Short Transmission Line.
- Solve The Numerical Based On Performance of Medium Transmission Line.
- Solve The Numerical Based On Single Phase Distribution System

Learning Outcomes:-

- Differentiate various types of transmission & distribution systems.
- Identify various components of substation & know their functions.
- Calculation of voltage regulation & efficiency of transmission system.
- Calculations of voltage drop of distribution system.

Books Recommended:

- A Course in Electrical Power **Soni-Gupta-Bhatnagar** Dhanpat Rai
- Principals of Power System **V. K. Mehta** S. Chand & Company
- A Course in Electrical Power **S. L. Uppal**. S. K. Khanna
- Transmission & Distribution of Electrical Energy **J. B. Gupta** S. K. Khanna