

COURSE CODE: <b>1151EE108</b>	COURSE TITLE: <b>TRANSMISSION AND DISTRIBUTION</b>	L	T	P	C
		<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>

**COURSE CATEGORY:**

Program Core

**PREAMBLE :**

To become familiar with the estimation of different line parameters in Transmission lines of power systems, modelling of the transmission lines for computing performance parameters, performance of insulators used in transmission lines and determining the voltage drop in various type of distributor

**PREREQUISITE COURSES:**

Electromagnetic fields, Circuit Analysis

**RELATED COURSES:**

Power System Analysis, Power System Operation & Control

**COURSE EDUCATIONAL OBJECTIVES :**

The objectives of the course are to make the students,

- To understand and estimation of transmission line parameters.
- To obtain the equivalent circuits of the transmission lines for determining voltage regulation and efficiency.
- To gain knowledge on design of insulators & their performance.
- To discuss about different types of cables.
- To impart knowledge on various types of distributor and calculate the voltage drop in distributors

**COURSE OUTCOMES :**

Upon the successful completion of the course, students will be able to:

CO Nos.	Course Outcomes	Knowledge Level (Based on revised Bloom's Taxonomy)
CO1	Discuss Modelling of the transmission line parameters.	K2
CO2	Explain the equivalent circuits for the transmission lines based on distance and determine voltage regulation and efficiency.	K3
CO3	Explain about insulators and their performance	K3
CO4	Explain different types & characteristics of cables.	K3
CO5	Explain about types of distributors & to estimate the voltage drop in distributors	K3

**CORRELATION OF COs AND POs**

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	H				L	L				L	M	
CO2	L					L	H			L	M	
CO3	M									L		
CO4	M		M		H		L				L	
CO5	H		M		H	M					L	

<b>COURSE CONTENT:</b>		
<b>UNIT I</b>	<b>TRANSMISSION LINE PARAMETERS</b>	<b>9</b>
Parameters of single and three phase transmission lines with single and double circuits - Resistance, inductance and capacitance of solid, stranded and bundled conductors, Symmetrical and unsymmetrical spacing and transposition - application of self and mutual GMD; skin and proximity effects - interference with neighbouring communication circuits.		
<b>UNIT II</b>	<b>MODELLING AND PERFORMANCE OF TRANSMISSION LINES</b>	<b>9</b>
Classification of lines - short line, medium line and long line - equivalent circuits, phasor diagram, attenuation constant, phase constant, surge impedance; transmission efficiency and voltage regulation, real and reactive power flow in lines- surge impedance loading- Ferranti effect.		
<b>UNIT III</b>	<b>INSULATORS &amp; MECHANICAL DESIGN OF LINES</b>	<b>9</b>
Mechanical design of Overhead lines – Line supports – Overhead line insulators – Classification. Voltage distribution in suspension insulators - string efficiency – Stress and sag calculation – effects of wind and ice. Formation of Corona- critical voltages - losses - effect on line performance.		
<b>UNIT IV</b>	<b>UNDERGROUND CABLES</b>	<b>9</b>
Comparison between overhead line and underground cable –Constructional features- Types of cables- insulation resistance - potential gradient - capacitance of single core and three core cables- grading of cables-Types of grading of cables.		
<b>UNIT V</b>	<b>DISTRIBUTORS</b>	<b>9</b>
DC Distributors: Concentrated and distributed loads-Two wire distributor- radial distributor-fed at one end- fed at both ends- Ring main feeder- Advantages- Three wire distributor. AC Distributors: Concentrated loads with power factor refers to load point- refer to common load-three phase three wire and three phase four wire distributors.		
<b>TOTAL: 45 PERIODS</b>		
<b>TEXT BOOKS:</b>		
<ol style="list-style-type: none"> <li>1. Wadhwa,C.L.,'Electrical power systems', New age International Pvt Ltd.publishers,1995.</li> <li>2. Gupta B.R.,' Power system Analysis &amp; Design', Wheeler Publishing, 2006.</li> </ol>		
<b>REFERENCE BOOKS:</b>		
<ol style="list-style-type: none"> <li>1. Cotton,H.,'Transmission and distribution of electrical Energy', ELBS,1985</li> <li>2. A. Chakrabarti ,P. V. Gupta , Soni M, Text Book on 'Power System Engineering', Wheeler Publishing .2009</li> <li>3. V.K. Mehta, Rohit Mehta, 'Principles of power system' Chand publications, 4th Edition.</li> </ol>		
<b>ONLINE RESOURCES:</b>		
<ol style="list-style-type: none"> <li>1. <a href="http://www.worldcat.org/title/transmission-and-distribution-of-electrical-energy-revised-edition/oclc/477100844?referer=di&amp;ht=edition">http://www.worldcat.org/title/transmission-and-distribution-of-electrical-energy-revised-edition/oclc/477100844?referer=di&amp;ht=edition</a></li> <li>2. <a href="http://www.home.iitk.ac.in/./Padiyar.pdf">http://www.home.iitk.ac.in/./Padiyar.pdf</a></li> </ol>		