Course Number and Name

BEE601 & Transmission and Distribution

Credits and Contact Hours

4 & 60

Course Coordinator's Name

Mr.Uma Mageshwaran

Text Books and References

Text Book:

1. Mehta V.K, Rohit Mehta "Power system" S. Chand & Co ltd, 2005.
2. D. P. Kothari and I J Nagrath, 'Modern Power System Analysis', Tata McGraw – Hill, 2nd Edition, 2008.
3. Singh S N, 'Electric Power Generation Transmission and distribution', PHI India, 2nd Edition, 2008.

References:

1. C.L. Wadhwa: Electrical Power Systems, 3rd Edn, New Age International Publishing Co., 2001.
2. Turan Gonen, 'Electric Power Distribution system engineering', CRC Press INC, 2 nd Edition 2007.
3. http://nptel.ac.in/courses/108102047/

Course Description

To learn the usage of passive elements in various Power Transmission Systems, To design a Transmission and distribution electric power system.

Prerequisites	Co-requisites
Electromagnetic Theory	Nil

required, elective, or selected elective (as per Table 5-1)

Required

Course Outcomes (COs)

CO1: To describe transmission element in power system network

CO2: Summarize the modelling of transmission and distribution components and analyze its Performance.

CO3: Apply the concepts of transmission line into real time transmission networks.

CO4: Identify major components of power transmission and distribution systems.

CO5: Know and appreciate the key factors in equipment specification and network design.

Student Outcomes (SOs) from Criterion 3 covered by this Course

COs/SOs	a	b	c	d	e	f	g	h	i	j	k	l

CO1	M	M	H	H	M	M	M	M	L	M	L	M
CO2	H	M	H	H	H	M	M	M	L	M	L	M
CO3	H	M	H	H	H	H	M	M	L	M	L	M
CO4	M	M	H	H	H	H	M	M	L	M	L	M
CO5	H	M	M	H	H	M	M	M	L	M	L	M

List of Topics Covered

UNIT I STRUCTURE OF ELECTRICAL POWER SYSTEMS 12

Structure of AC power system- single line diagram- EHVAC and HVDC transmission advantages and disadvantages –comparison of AC and DC transmission- Substations- various bus bar arrangement in substations– Economic choice of conductor size- Kelvin's law

UNIT II ELECTRICAL DESIGN OF TRANSMISSION LINES 12

Resistance, inductance and capacitance calculations in single and three phase transmissions lines –stranded and bundled conductors – symmetrical and unsymmetrical spacing, transposition- self and mutual GMD – skin and proximity effect

UNIT III PERFORMANCE OF TRANSMISSION LINES 12

Equivalent circuit for short, medium and long transmission lines – analysis- efficiency and regulation – tuned power lines, attenuation and surge impedance loading – power circle diagram for receiving end and sending end –voltage control of line – shunt and series compensation

UNIT IV CABLES AND INSULATORS

Underground cables – types, construction – capacitance of the ca – insulation resistance – dielectric stresses and grading – dielectric losses – capacitance and inblester sheath grading – thermal characteristics – capacitance of three core cable – Insulators – types - advantages – voltage distribution in suspension insulators – string efficiency – method of improving string efficiency.

UNIT V MECHANICAL DESIGN OF TRANSMISSION LINES 12

Sag and Tension- Sag calculation for equal and unequal level supports – effect of wind and ice – Consideration in mechanical design of lines – stringing chart- corona characteristics.