

Course Syllabi: UEE402 Transmission and Distribution of Power (L : T : P :: 2 : 1 : 0)

1. **Course number and name:** UEE402; Transmission and Distribution of Power

2. **Credits and contact hours:** Credits: 2.5; Hours: 3

3. **Text book, title, author, and year**

- *Chakrabarti, A., Soni, M.L., Gupta, P.V. and Bhatnagar, U.S., a Text Book on Power System Engineering, DhanpatRai (2008).*
- *Wadhwa, C.L., Electrical Power Systems, New Age International (P) Limited, Publishers (2008) 4thed.*
- *Gupta, B.R., Power System Analysis and Design, S. Chand (2009).*
- *Nagrath, I.J. and Kothari, D.P., Power System Engineering, Tata McGraw–Hill (2007).*
- *Pabla, A.S., Electric Power Distribution, McGraw Hill (2008).*
- *Stevenson, W.D., Power System Analysis, McGraw–Hill (2007) 4thed.*

a. Other supplemental materials

- Nil

4. **Specific course information**

a. Brief description of the content of the course (catalog description)

Introduction: Structure of power systems, Growth of power systems–Indian overview, Interconnections and their advantages, Transmission system planning.

Transmission Lines: Choice of voltage and frequency, Types of conductor, Size of conductor, Electrical parameters of transmission lines, Resistance, Inductance and capacitance, GMR and GMD.

Mechanical design of overhead transmission lines: Tension and sag calculations, Effect of weather conditions, Sag template, Stringing charts, Vibrations and vibration damper.

Insulators: Insulator types, String efficiency, Grading rings, Arcing horns, Armored rods.

Transmission Line Performance: Characteristics and performance of power transmission lines: Short, Medium, Long lines, Generalized constants, Power flow, regulation, Power circle diagrams, Series and shunt compensation, Corona visual and disruptive, Critical voltage, Corona loss, Electrostatic and electromagnetic interference with communication lines.

Insulated Cables: Constructional features, Parameters, Cable laying procedures, Fault location Methods, High voltage cables, Thermal characteristics, Comparison of rating of single core and multi core cables, Introduction to XLPE cables.

Distribution Systems: Primary and secondary distribution, Ring main and radial systems, Systematic design of distribution systems.

EHV transmission and HVDC transmission: An introduction, Configurations and comparison Indian electricity rules: Introduction and familiarization.

5. **Specific goals for the course**

After the completion of the course, the students will be able to:

- Understand the structure of power system.
- Analyse the transmission line models and evaluate its performance parameters.
- Design the transmission lines under various working conditions.
- Describe and select the configurations of different line insulators and evaluate their performance.

- Supervise the laying of cables and fault detection in cables.
- Design the distribution system network.

6. Brief list of topics to be covered

- Transmission Lines
- Insulators
- Distributed systems
- EHV transmission and HVDC transmission