Course Type	Course Code	Name of Course	L	T	P	Credit
DC	EEC207	Power System Engineering	3	0	0	9

Course Objective

This course is mainly for undergraduate third-year Electrical Engineering students. It will introduce and explain the fundamental concepts and components of electrical power system engineering.

Learning Outcomes

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

- understand real-time power system structure and different phenomenon associated with it,
- understand basic concepts of underground cables, overhead line insulators, transient over voltages and insulation coordination,
- understand corona, sag and tension of transmission line.

Unit No.	Topics to be Covered	Lecture Hours	Learning Outcome
1	Fundamental of Power Systems: 3 phase transmission, complex power, the per unit system, Basic concept of various types of Power Generation; Overhead Transmission Line: Choice of voltages	5	Understanding the basic structure of power system.
2	Types of conductors, Inductance and capacitance of single and three phase symmetrical and unsymmetrical configurations, Bundle conductors, Transposition, Concept of GMD and GMR.	8	Understanding the behavior of conductors
3	Overhead Line Construction: Line supports, Towers, Poles, Sag, Tension and clearance, Effect of wind and ice on sag, Dampers. Insulators: Types, String insulator, String efficiency & methods of its improvement. Corona: Principle of corona formation and Methods of reduction of corona	8	Knowledge about detail modelling and characteristic of overhead line and insulator.
4	Underground Cables: Types of cables, Capacitance of single core and 3 core cables, Dielectric stress, Optimum cable thickness, Grading, Dielectric loss and loss angle.	7	Knowledge on underground cable
5.	Performance of Lines: Short, Medium (nominal π, T) and long lines and their representation. A, B, C, D constants, Voltage regulation, Ferranti effect, Power equations and line compensation	8	Understanding the line performance characteristic.
6.	Transients in power system: Transients in simple circuits, Traveling waves in transmission line, over voltage due to arcing ground.	6	Understanding basic behavior of transients in power system.

Text Books

1. Power System Analysis by J.J.Grainger and Wolliam D.Stevenson
2. Electrical Power Systems by C.L.Wadhwa

Reference Books:

1. Electric Energy Systems Theory by O.J.Elgard