EE-403: Fundamentals of Power Systems

Credit	L	T	P
3	**2**	**1**	**-**

UNIT-I

Line parameters, Resistance, calculation of inductance of single phase and three phase line with equilateral and un- symmetrical spacing, transposition, GMD, GMR, Capacitance calculation of two wire three phase line with symmetrical and un- symmetrical spacing, skin effect and proximity effect.

UNIT-II

Representation of short and medium lines, nominal T and Pie method, solution for long line, ABCD parameters, receiving and sending end voltage, regulation and efficiency.

UNIT-III

Ferranti effect, corona, disruptive critical voltage, visual corona, corona power loss, interference between power and communication circuits, types of insulators and their constructional features, potential distribution in string of suspension insulator, method of equalizing the potential, string efficiency, single and bundle conductors.

UNIT-IV

Types and construction of cables, insulation resistance of a cable, capacitance and grading in cables, current rating of power cable, dielectric stress, overhead lines versus underground cables, types of towers and poles used, standard clearance, sag calculation in conductor suspended on level supports and support at different levels, effect of wind, ice, tension and sag at erection.

UNIT-V

Substation classification, layout, scheme of bus-bar arrangement, single line diagram of typical sub- station showing location of different components and their functions, grounding and testing of installation.

TEXT/REFERENCE BOOKS.

1. William D. Stevensen, Jr., “Elements of Power System Analysis”, Mc Graw Hill Co., Singapore.
2. H. Cotton and Barber, “The Transmission and Distribution of Electrical Energy”, B. I. Publications Pvt. Ltd., New Delhi.
3. I. J. Narath and D. P. Kothari, “Modern Power System Analysis”, Tata Mc Graw Hill Publishing Co., New Delhi.
4. C. L. Wadhwa, “Electrical Power System”, Wiley Eastern Ltd., New Delhi.
5. Hadi Sadat, “Power System Analysis”, Tata Mc Graw Hill Publishing Co., New Delhi.