EES-701:Advanced Power Systems

Credit	L	T	P
4	**3**	**1**	**-**

UNIT-I

System constraints, Economic dispatch neglecting losses, Optimal load dispatch including transmission losses, Exact transmission loss formula, Coordination equation, Automatic load dispatching

UNIT-II

Methods of voltage control, VAR compensation, Reactive power injection and Control by transformers, Power flow through transmission line, Receiving-end and Sending-end power circle diagrams, Universal power circle diagram.

UNIT-III

Introduction to automatic generation and voltage control, Speed governor, Turbine and Power system modeling, Load Frequency Control (LFC), Single area case, Automatic voltage control.

UNIT-IV

Introduction, Rotor dynamics, Swing equation, Power angle curve, Steady state stability, Transient stability, Equal area criterion (Sudden change in mechanical input, sudden loss of one of the parallel lines, sudden short-circuit on one of the parallel lines), Point-by-point solution of the swing equation, Multi-machine stability studies, Factors affecting transient stability, Effect of grounding on stability, Prevention of steady-state pullout.

UNIT-V

Flexible AC transmission, Series and Shunt Compensation schemes, HVDC transmission, Limitation and advantages, Classification of DC links, Back – to – back and bulk power supply systems.

TEXT/REFFERENCE BOOKS

1. William D. Stevenson Jr, ‘Elements of Power System Analysis’, Tata McGraw Hill Publishing Co., New Delhi.
2. C. L. Wadhwa, ’Electrical Power System’, New Age International, New Delhi.
3. J. Nagrath and D. P. Kothari, ‘Modern Power System Analysis’, Tata McGraw Hill Publishing Co., New Delhi.
4. N. G. Hingorani and L. Gyugyi, ‘Understanding FACTS’, IEEE Press, USA.