MTPS – 401 Restructed Power Systems

Fundamentals of restructured system, Market Architecture, Load Elasticity, Social welfare maximization, OPF: Role in vertically integrated systems and in restructured markets, Congestion Management, Optimal Bidding, Risk assessment and Hedging, Transmission Pricing and Tracing of power, Ancillary Services, Standard Market Design, Distributed Generation in restructured markets, Developments in India, IT applications in restructured markets, Working of restructured power systems : PJM.

Reference Books:

1. Understanding electric utilities and de-regulation, Lorrin Philipson, H. Lee Willis, Marcel Dekker Pub., 1998.
2. Power system economics: designing markets for electricity Steven Stoft, John Wiley & Sons, 2002.
3. Operation of restructured power systems. Kankar Bhattacharya, Jaap E. Daadler, Math H.J. Boolen, Kluwer Academic Pub., 2001.
4. Restructured electrical power systems: operation, trading and volatility Mohammad Shahidehpour, Muwaffaq Alomoush, Marcel Dekker Pub., 2001

w.e.f. 2014-15

MTPS – 402 Power System Transients

UNIT 1

Origin and nature of transients and surges. Equivalent circuit representations. Lumped and distributed circuit transients. Line energisation and de-energisation transients. Earth and earthwire effects.

UNIT 2

Current chopping in circuit breakers. Short line fault condition and its relation to circuit breaker duty. Trapped charge effects. Effect of source and source representation in short line fault studies. Control of transients.

UNIT 3

Lightning phenomena. Influence of tower footing resistance and earth resistance. Traveling waves in distributed parameter multi-conductor lines, parameters as a function of frequency.

UNIT 4

Simulation of surge diverters in transient analysis. Influence of pole opening and pole closing. Fourier integral and Z transform methods in power system transients. Bergeron methods of analysis and use of EMTP and EMTDC/PSCAD package.

UNIT 5

Insulation Coordination : overvoltage limiting devices, dielectric properties, breakdown of gaseous insulation, tracking and erosion of insulation, high current arcs.

Reference Books :

1. Power System Transients by Vanikov
2. Power System Transients by C. S. Indulkar and D.P. Kothari
3. Power Circuit breaker theory and design by Flurscheim C.H.
4. EMTP Rulebook
5. EMTDC/PSCAD Rulebook

w.e.f. 2014-15