POWER SYSTEM OPERATION AND CONTROL (3-1-0)

Module – I (10 hrs)

Fundamental of power System : concepts or real and reactive powers, Complex power per unit representation of power system. Transmission capacity, series and shunt compensation, Load characteristics, Real power balance and its effect on system frequency, Load frequency mechanism, reactive power balance and its effect on system voltage, on load tap changing transformer and regulating of transformer, Introduction to FACT devices.

Module – II (6 hrs)

Load Flow Analysis : System model : The static load flow equation (SLFE), Definition of the load flow problem, Network model formulation, A load flow sample study, Computational aspects of the load flow problem, effect of regulation transformers.

Module – III (10 hrs)

Load frequency Control : Dynamic incremental state variable, PF versus QV control MW frequency of an individual generator, modeling of speed governing system, Turbine, Division of power system into control areas, P-F control of single control area and two are control, Economic dispatch controller.

Module – IV (14 hrs)

Economics Operation of Power System : Distortion of load between units within a plant, Transmission losses as function of plant generation, Calculation of loss coefficients, Distribution of loads between plants with special reference to steam and hydel plants, Automatic load dispatching, Unit commitment, Power System Stability : Steady state stability, transient stability, Swing equation, Equal area criterion for stability, Methods of improvement of transient stability, Stability analysis of multimachine power systems.

1. Power System Analysis, Hadi Saadat, TMH
2. Power System Analysis and Design, B. R. Gupta, S. Chand
3. An introduction to electric Energy System Theory, O.I. Elgerd, TMH
4. Elements of Power System Analysis, W.D. Stevenson, TMH