

	control, condition monitoring and power distribution instrumentation.	
6.	MONITORING regulation and monitoring: Hydroelectric power generation, automatic regulation and monitoring of voltage and frequency, modelling & Simulation: Computerized modeling & simulation of Electric Machines, data acquisition and logging.	8
7.	CONTROL ASPECTS feedback Systems: Cascaded feedback systems. Feed forward control systems, servomechanisms: Hydraulic servomechanisms, Introduction to oil hydraulics. Valve controlled hydraulic motors. Pump controlled hydraulic motors. Electrohydraulic servo systems. Electrohydraulic position servo.	8
8.	PROTECTION: Principles of power system protection: system Vs apparatus protection, analog Vs digital protection, protection system components: potential and current sensors, relays, fuses, circuit breakers, Computerized status monitoring, zone protection, back up schemes, protective relays: Type and classification of relays, different types of relays: differential and percentage differential relay, impedance, admittance, reactance relays, distance protection concept, Carrier and pilot wire systems, Significance of computerized protection systems. power circuit breakers: Arc characteristics, arc interruption, arc gaps, types of circuit breakers: air, oil, vacuum, SF6, automatic circuit re-closers, Apparatus protection: generator, transformer, transmission lines protection systems.	8

Suggested Readings:

Badri Ram, D.N. Vishwakarma: Power System Protection and Switchgears, TMH
 Varshney R.S. Hydro Power Structures, Nem Chand & Bros.
 Sunil S. Rao *Switch gear and protection*
 Elgerd *Electrical Energy System Theory* McGraw Hill
 Stevenson *Elements of Power System Analysis* McGraw Hill
 Elgerd, *Electrical Energy System Theory*, Mc Graw-Hill
 Deshpande, *Elements of Electrical Power, Station Designs* Pitman & sons.
 Willenbrock and Thomas, *Planning, Engineering and Construction of Electrical power generating facilities* John Wiley and Sons.