EEE 346 Electromechanical Devices & Machines II

Electric Machine structures and construction: Machine windings concentrated and distributed windings: DC and AC versions, Phase & multiple phase windings. Induction Machines: Review of equivalent circuits and torque-slip characteristics, circle diagram method of performanceprediction; MMF produced by Electric Machine windings. Winding Factor and transients: the coupled circuit view point. Synchronous machines on infinite bus bars, parallel operation of synchronous generators. Poly phase induction machines: Construction performance, equivalent circuit, circuit diagrams, astir / speed control, unbalanced operation, induction motors, generators, transient. Single phase machines induction motors, synchronous motors, repulsion motors, etc. DC machines: Construction features, methods of excitation, generator and motor operation, generators in parallel, starters and speed control, losses, efficiency, testing, armature reaction and communication. Synchronous machines: Theory of cylindrical motor machine, salient pole construction reactance, voltage regulation by different methods, parallel operation and operation on infinite bus. Design of Electrical Machines; transformers, DC & AC machines. Induction Machines (3-phase, Single phase types) DC Machines: Windings, generator and Motor characteristics. AC generators construction and operation; polyphase induction motors; synchronous machines- construction, types and applications. Transformers: types, equivalent circuits, single phase, three phase open circuit and short circuit tests, circle diagrams. Faults on machines, methods of starting and protection of machines.