**EEE 325: Electrical Machines I**

* Basic principles of relays and actuators. Transformation of Electric energy. Transformer performance; equivalent circuits, efficiency, regulation, per unit values. Types of Transformers: Auto transformer, Instrument Transformer, Elements of Transformer design. Transformer in Polyphase circuits. Parallel operation of transformers. Basic principles of electromechanical energy conversion. Direct current machines: armature windings, internal torque, and methods of excitation. Armature reaction. Characteristics of D.C. generators and Motors. Basic principles of selection of motors and generators for practical application. **Speed control and electric braking. Cross-field machines. Commutator machines.**

**EEE 326: Electrical Machines II**

* Rotating magnetic fields, 2 winding stator, M-phase stator.
* A.C. machines, windings, e.m.f. equations, effects of harmonics.
* Three phase induction motors-equivalent circuits, steady state operation, speed control. Single phase induction motor.
* Synchronous machines: Construction, synchronous reactance, equivalent circuits, regulation and steady state operation. Special generators: Synchronous motor, power factor control and starter. Independent generators. Parallel operation of synchronous machines.