PRE-REQUISITES: Basic Electrical Technology: Knowledge of elementary calculus

INTENDED AUDIENCE: UG Electrical Engineering as core subject. UG Mechanical and Mining Engineering as Elective subject.

INDUSTRIES APPLICABLE TO: BHEL, CESC, NTPC, WBPDCL

COURSE OUTLINE:

ABOUT INSTRUCTOR:
Tapas Kumar Bhattacharya has over thirty years of teaching experience at IIT Kharagpur. Taught signals & system core course at IIT Kharagpur several times. Area of research interest is in the field of electrical machines and special electrical machines and circuits.

COURSE PLAN:
Week 1: Single phase Ideal transformer and basic equations. Its equivalent circuit.
Week 2: Core loss: Eddy current and hysteresis loss
Week 3: Taking Leakage flux, winding resistances and core loss in the equivalent circuit of the transformer.
Week 4: Exact and approximate equivalent circuit. Phasor diagram. Regulation & efficiency.
Week 5: Open circuit and short circuit tests. Estimation of equivalent circuit parameters.
Week 6: Three phase transformer and various connections with vector groups.
Week 7: DC machine constructional features and basic idea of its operation. Armature winding, commutator segments and brushes.
Week 8: Lap and wave windings and number of parallel paths in armature circuit. Emf equation.
Week 9: Torque equation. Separately excited and shunt generator characteristics.
Week 10: Armature reaction and its ill effects. How to nullify the effects of armature reaction.
Week 11: Shunt, series and compound motor characteristic.
Week 12: Starting, speed control and braking of DC motor. Testing.