



Tentative Lecture Plan for EEE 203 (L2/T1 Section A) (Energy Conversion I)

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Classroom: ECE 923

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Books:

1. 'Electric Machinery Fundamentals' – Stephen J. Chapman
2. 'Electric Machines: Theory, Operation, Applications, Adjustment, and Control' – Charles I. Hubert

OUTLINE OF THE LECTURES

Lecture ID		Topics
1-5	Transformers	Principle of operation, construction, no load and excitation current, behavior during loading, effect of leakage flux, ideal transformer, leakage reactance and equivalent circuit of a transformer, equivalent impedance.
6-11		Voltage regulation, per unit quantities, regulation, losses and efficiency, determination of parameters by tests, polarity of transformer windings, vector group, transformer parallel operation.
12-17		Harmonics in excitation current, transformer inrush current, three phase transformer connections, three phase transformers, harmonic suppression in three phase transformer connection. Autotransformer, instrument transformers.
18-22	Three phase induction motors	Rotating magnetic field, reversal of rotating magnetic field, synchronous speed, torque in induction motor, induction motor construction: squirrel cage, wound rotor
23-27		Slip and its effect on rotor frequency and voltage, equivalent circuit of an induction motor, air gap power, mechanical power and developed torque, torque speed characteristic, losses, efficiency and power factor, classification
28-32		Motor performance as a function of machine parameters, shaping torque speed characteristic and classes of induction motor, per unit values of motor parameters, determination of induction motor parameters by tests, methods of braking, speed control.
33-34	Induction generators	Operation, characteristics, voltage build up, applications in wind turbine.



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Assessment Policy (as per University Rule):

There will be 4 (Four) class tests, each about 20 minutes. The best 3 (Three) will be considered for final grades. The weights of the final grading are:

- Class participation – 10%
- Quizzes – 20%
- Final Exam – 70%