



Tentative Lecture Plan for EEE 205 (EEE L2/T2 Section C) (Energy Conversion II)

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Classroom: ECE 627

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Course Materials:

Lecture Notes	To be supplied
Textbook(s)	Electric Machinery Fundamentals, Stephen Chapman, ISBN-13: 978-0073529547
Reference Book(s)	Electric Machines: Theory, Operation, Applications, Adjustment, and Control – Charles I. Hubert

Contents

Synchronous generator: construction, armature (stator) and rotating field (exciter), excitation system with brushes and brushless excitation system, cooling, generated voltage equation of distributed short pitched armature winding, armature winding connections and harmonic cancellation in distributed short pitched winding, equivalent circuit, synchronous impedance, generated voltage and terminal voltage, phasor diagram, voltage regulation with different power factor type loads, determination of synchronous impedance by tests, phasor diagram, salient pole generator d-q axes parameters, equivalent circuit, generator equations, determination of d-q axes parameters by tests, equation of developed power and torque of synchronous machines (salient and non-salient pole motor and generator). Parallel operation of generators: requirement of parallel operation, conditions, synchronizing, effect of synchronizing current, hunting and oscillation, synchroscope, phase sequence indicator, load distribution of alternators in parallel, droop setting, frequency control, voltage control, house diagrams.

Synchronous Motors: construction, operation, starting, effect of variation of load at normal excitation, effect of variation of excitations, V curves, inverted V curves and compounding curves, power factor adjustment, synchronous capacitor, and power factor correction. DC motors: principle of operation, constructional features, back emf and torque equations, armature reaction and its effect on motor performance, compensating winding, problems of commutation and their mitigations, types of dc motors and their torque speed characteristics, starting and speed control of dc motors, applications of different types of dc motor.

Single Phase Induction Motor: operation, quadrature field theory, double revolving field theory, split phasing, starting methods, equivalent circuit, torque-speed characteristic, and performance calculation.

Introduction to photovoltaic systems

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%