

EE 340 COURSE SYLLABUS

Spring 2008

Instructor: Dr. Y. Baghzouz

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Office Hours: 2:30-4:00 T&TR, 9:30-12:30 W

Book Title: S.J. Chapman, *Electric Machinery and Power System Fundamentals*, McGraw-Hill, ISBN 0-07-229135-4

References:

1. Electric Machines and Power Systems, Del Toro, Prentice Hall, 1985.
2. Electric Machinery, A.E. Fitzgerald, C. Kingsley, Jr., and S.D. Umans, McGraw-Hill, 1990.
3. Electromechanical Energy Devices and Power Systems, Z.A. Yamayee and L.L. Bala, John Wiley & Sons, 1994.
4. Electric Energy Conversion and Transmission, S.A. Nasar, Macmillan Publishing Co., 1985
5. Power System Analysis, C.A. Gross, John Wiley, 1990
6. Power System Analysis and Design, J.D. Glover and M.S. Sarma, Thomson Learning, 2002.

Pre- and Co-requisites:

Corequisite: EE 330 (Formerly EEG 430).

Prerequisites: EE 320 (Formerly EEG 308).

Course Objectives:

- Calculate various powers and correct the power factor in 1-phase and 3-phase power circuits,
- Derive the efficiency, voltage regulation, electrical parameters, and loading on power transformers,
- Synchronous generator electrical characteristics including synchronization and control of power,
- The electromechanical characteristics of 3-phase induction motors, synchronous motors and DC motors,
- Types of power lines and how to determine their electrical parameters, and voltage regulation and efficiency under load,
- Learn basic techniques for power flow studies
- Calculate symmetrical and unsymmetrical fault currents.

- Utilize software to conduct power flow and fault calculations in complex power systems.

Course Outcomes:

Students should be able to

- Calculate real, reactive and apparent power, and power factor of given electrical loads, and determine appropriate capacitor size for desired power factor correction,
- Analyze three-phase circuits, and derive balancing and compensator elements for unbalanced loads.
- Determine the circuit parameters of power transformers, calculate their efficiency and voltage drop under various loads
- Determine the circuit parameters of transmission lines, and means of controlling real and reactive power flow as well as line compensation and limitations.
- Determine the equivalent circuit parameters of synchronous machines, synchronize these machines to a power system, and control the active and reactive power generation.
- Have an understanding of the workings of three-phase AC motors, synchronous motors and DC motors, in terms of equivalent circuit parameters, and torque-speed curves.
- Derive the Y-bus matrix and power flow equations of a given network and perform such a study using a software package.
- Derive the short-circuit equations of a given network and perform such a study using a software package.

Computer Usage:

PSpice, EasyPower, Matlab

Tests & Homework:

	Subject	Value
Test 1	Fundamentals, Transformers, synchronous machines	20 Points
Test 2	Induction motors, DC motors, Transmission lines	20 Points
Test 3	Power system representation., power flow, fault calculations	20 Points
Project	Transformer Design	20 Points
Final	(covers all course material)	30 Points
Homework		30 Points
Total		140 Points

Grading:

A ≥ 110 > B ≥ 90 > C ≥ 70 > D ≥ 60 > F

Notes:

- Late homework will not be accepted.
- There will be no make-up tests.
- Class attendance and participation is highly encouraged.

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Missed Class(es) / Student –

As a general rule, a student missing a class or laboratory assignment because of observance of a religious holiday shall have the opportunity to make up missed work. Students must notify the instructor of anticipated absences by the last day of late registration, January 28, 2008, to be assured of this opportunity. Faculty may give students an additional week, but are encouraged to set a clear deadline. NOTE: Students who represent UNLV at any official extracurricular activity shall also have the opportunity to make up assignments, but the student must provide official written notification to the instructor no less than one week prior to the missed class(es).

Rebelmail –

By policy, faculty and staff should only e-mail students’ Rebelmail accounts. Rebelmail is UNLV’s official e-mail system for students. It is one of the primary ways students receive official university communication. All UNLV students receive a Rebelmail account after admission to the university. Non-admitted students should contact the Student Help Desk at (702) 895-0761, in the Student Union Room 231, or by e-mail: studenthelp@unlv.edu. See <http://rebelmail.unlv.edu/> for information.

UNLV Writing Center –:

One-on-one or small group assistance with writing is available free of charge to UNLV students at the Writing Center, located in CDC-301. Although walk-in consultations are sometimes available, students with appointments will receive priority assistance. Appointments may be made in person or by calling 895-3908.

The student's Rebel ID Card, a copy of the assignment (if possible), and two copies of any writing to be reviewed are requested for the consultation. <http://writingcenter.unlv.edu/>