ECE 2006 – Syllabus – Spring 2008

REQUIRED COURSE

Instructor: Scott R. Norr Office: 43 MWAH Phone: 726-8947
Office Hours: 10:00-11:00 Mondays, Wednesdays and Thursdays
Email: snorr@d.umn.edu

OFFICE SCHEDULE

Lecture Place & Time: MWAH 195, 3:00 – 3:50 PM MWF
Lab Place & Time: MWAH 391, M, W from 4:00 to 7:00 pm

Lab Manual: Laboratory exercises will be available on the course website, www.d.umn.edu/~snorr/ece2006s8

Computer Usage: PSpice is required to simulate different types of circuits. PSpice is available for download at http://www.rcgresearch.com/support.php (click on “Downloads”). PSpice is also available on all ECE computers.

Assessment: Labs - 25%; Homework - 10%; Exams I and II - 40%; Final Exam - 25%.
Labs are graded on a 20 point scale. Labs are due in Lab on the following Tuesdays.
Homework is due in class, one week from the date assigned.
Material that you submit for grading is expected to reflect your own ideas and work.

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Dates  Topic        Chapter
1/23,25 Introduction, Mathematic Concepts, Voltage, Current 1
1/28,30 Kirchoff and Ohm’s Laws, Series, and Parallel Circuits 2
2/4,6,8 Mesh and Nodal Analysis, P-SPICE 3
2/11,13,15 Superposition, Thevenin Equivalents 4
2/18,20,22 Norton Equivalents, Maximum Power Transfer, Exam I 4
2/25,27,29 Source Transformation, Operational Amplifiers 5
3/3,5,7 Sum and Difference Amplifiers, Energy Storage Elements 5,6
3/10,12,14 Capacitors and Inductors in Series and Parallel 6
3/17,19,21 SPRING BREAK
3/24,26,28 First Order RL and RC Circuits, source-less and unit-step 7
3/31 Circuits With Two Storage Elements, Forced Response 8
4/7,9,11 Total response, Unit Step Response, Laplace, Exam 2 15, 16
4/14,16,18 Sinusoidal Sources, Phasors, Impedance and Admittance 9
4/21,23,25 AC Steady State Analysis 10
4/28,30 AC Steady State Power, 3-Phase AC 11,12
5/5,7,9 Magnetically Coupled Circuits 13
5/13 FINAL EXAM Tuesday, May 13, 4-6pm

Accreditation Outcomes Addressed By This Class: (Students should demonstrate:....)

a. an ability to apply knowledge of mathematics, science and engineering
b. an ability to design and conduct experiments, as well as to analyze and interpret data
c. an ability to design a system, component, or process to meet desired needs
e. an ability to identify, formulate, and solve engineering problems.
g. an ability to communicate effectively.
i. a recognition of the need for, and an ability to engage in life-long learning
k. an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.
n. an ability to work in a hands-on laboratory in most of the required courses.

Prepared by ___________________________ Date: January 19, 2008
2005-2007 Catalog Course Description:

Pre-requisite: PHYS 2011
Co-requisite: MATH 3280

Course Objectives:
- Master resistive circuits. (a,b,c,e,n)
- Introduce dependent sources and operational amplifiers. (a,b,c,e,n)
- Discuss thoroughly different analysis methods such as nodal and mesh analysis, and source transformation in solving circuits. (a,b,c,e,i,k,n)
- Incorporate energy storage elements such as inductors and capacitors in circuit analysis. (a,b,c,e,i,k,n)
- Master first and second order circuits. (a,b,c,e,i,k,n)
- Analyze sinusoidal sources using phasors. (a,b,c,e,i,k,n)
- Emphasize AC steady state analysis and power. (a,b,c,e,i,k,n)
- Introduce three-phase AC circuits. (a,b,c,e,i,k,n)

Educational Goals:
This first course, circuit theory, is designed to familiarize students with the analysis and design of basic circuits. This course covers resistive circuits, dependent sources operational amplifiers, energy, storage elements, first and second order circuits, AC excitation and phasor, steady state analysis and power, and three-phase circuits: the laboratory component of the course provides students an opportunity to use instruments, such as scopes and meters for measuring voltages and currents in different circuits. In addition, students will have the opportunity to analyze and design circuits using Pspice.

Clear documentation of lab results and a formal report are required. Comparison of lab and theoretical results are required.

Relationship to ECE Program Objectives:
- Introduce students to the first course in circuit analysis.
- Requires students to apply integral and differential calculus in order to study circuit response.
- Prepares students to analyze and design advanced circuits.
- Exposes student to AC analysis and prepares them to take courses in power, control systems and electronics.