ECE 320 Fundamentals of Electrical Engineering

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Course level: Undergraduate students in engineering outside ECE majors

Pre-requisite: PH 106 for basic knowledge of electricity and magnetics
Co-requisite: MATH 238 through differential equations

Lectures: TR 11:00 am – 12:15 pm, Shelby Hall, 1093

Office hours: TR 2:00 pm - 3:00 pm, or per appointment

Course description
This course is designed to teach engineering students who are not ECE majors the fundamental concepts and methods of time-domain and steady-state circuit analysis, electronics, and electromechanics. Topics covered include circuit fundamentals, transient analysis, AC circuit and power, frequency response, operational amplifiers, and electric machines. This course will help engineering students learn the language of ECE colleagues and prepare them to work effectively in multi-disciplinary teams.

Topics to be covered (tentative, subject to change):

Part I: Electric Circuits
1. Fundamentals (KCL, KVL)
2. Resistive network (node voltage and mesh current methods, equivalent circuits) (Midterm exam 1)
3. Capacitor and inductor, DC transients
4. Steady-state AC circuit analysis (phasor, impedance)
5. AC power (Midterm exam 2)
Part II: Electronics and Electromechanics

6. Frequency response
7. Operational amplifiers
8. Principles of electromechanics
9. Introduction to electric machines (Final exam)

Required textbook

Reference book (on reserve in Rodgers Science & Engineering Library):

Homework and exam policy
Homework discussion in small groups is encouraged. However, each student must work through problems individually. Late homework will receive a maximum score of 50%, up to two days late. Homework later than two days will receive the grade of zero. Exams will be completed individually during class time, and will be closed book. If an examination is missed due to a University approved activity or documented emergency/illness, the grade of comprehensive final exam will be used in place of the missing exam score. Missed examinations due to unexcused absences receive the grade of zero. No makeup exams will be provided for any circumstances.

Grading
Homework, weekly ........................................ 20%
Midterm exam 1 ........................................... 25%
Midterm exam 2 ........................................... 25%
Final Exam .................................................. 30%