ECE 320 Fundamentals of Electrical Engineering

Instructor: Dr. Dawen Li, Associate Professor
Office: 2005 NERC
Phone: (205) 348-9930
Email: dawenl@eng.ua.edu

Course level: Undergraduate students in engineering outside ECE major

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, Bevill Building, room 0009

Office hours: MW 4:00 pm – 5:00 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)
3. Capacitor and inductor, DC transients (Midterm exam 1)
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*. No late homework will be accepted. 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. Pop quizzes are possible to maintain class attendance and participation. Pop quizzes will count as a homework assignment in the grading process.

Grading
Homework, weekly (including pop quizzes)  ......................10%
Quiz .........................................................................................10%
Midterm exam 1  .................................................................25%
Midterm exam 2 .................................................................25%
Final Exam .................................................................30%