PHYS 245 – Introduction to Electricity and Electronics  
2007 Spring Course Syllabus

Instructor  
Edmund Nowak / nowak@udel.edu / 228 Sharp Lab / 831-2676  
Office hours: T: 10:30 – 11:30am, F: 2:30 – 3:30pm, and by appointment.  
Department office: 223 SHL / x2661

Lecture  
M W F / 10:10am – 11:00am / Room 130 Sharp Lab / Sections 010

Discussion & Laboratory  
See registration booklet for days and times your section meets.

Teaching Assistants  
Discussion: Sections 20 - 22 / Room 105 (020), 109 SHL (021, 022) // Dansha Jiang / dsjiang@udel.edu / 012B SHL / x3254  
Labs: Sections 20 – 22, 23 - 25 / 101B SHL // Xing Chen / cx@udel.edu / 128 SHL / x4264  
Lab Coordinator: David Johnson / 020A SHL / x1240

Course Description  
This course offers a calculus-based introduction to electricity, electromagnetic induction, and electronics. The concepts of electric and magnetic fields are introduced and applied to AC, DC, and digital-logic circuits. Course concludes with electromechanics. The course integrates conceptual understanding with extensive problem solving and laboratory experience.

Credit hours  
4 hrs

Course Prereq.  
PHYS 207, MATH 243 is a co-requisite.

Course Objectives  
➢ To develop a basic understanding of electric phenomena in terms of charges, forces, and fields. Application of these concepts to the analysis and design of AC and DC circuits.  
➢ Develop an understanding of the principles of digital-logic circuitry and to design simple digital circuits.  
➢ To understand and apply electromagnetic induction for electric machines  
➢ Build an awareness of physical sensors and interfacing sensors to electronics for monitoring  
➢ Develop problem solving skills and improve mathematical competence.  
➢ Build a general awareness of how the principles of electricity and magnetism apply to electronics and real-world events.  
➢ To actively explore these principles through laboratory experiments.

Course Topics  
• Electric force and field  
• Circuits: resistive networks, ac network analysis, transient & frequency response, safety  
• Sensors: temperature, strain, pressure  
• Electronics: operational amplifiers, digital logic circuits  
• Magnetic field and electromagnetic induction, electromechanics  
• Introduction to motors

Text Books  
➢ Phys 245 Laboratory Manual (online, see www.physics.udel.edu/~nowak/phys245/).

revised March 5, 2007
Grading Procedures

Your course grade will be determined by the following components:

- 20% Activities in the lab
- 13% Homework
- 13% Quizzes
- 18% on each of the 3 exams

Exam Dates: Fridays, March 16, April 27, plus a cumulative final TBA

A tentative grading scale is:

A > 90, A- > 87, B+ > 84, B > 80, B- > 77, C+ > 74, C > 70, C- > 67, D+ > 64, D > 60, D- > 57, and F < 57.

Course Policies

- Homework must be submitted at the BEGINNING of lecture on Wednesdays. NO late submissions.
- Homeworks will not be graded. Each homework problem is worth 1 point. You will receive either zero or one point based on whether your work on that problem was satisfactory and represented a genuine attempt at solving the problem.
- All quizzes and exams will be based largely on concepts showing up in homework problems.
- Lab TA will provide requirements and guidelines for laboratory reports
- Quizzes at the end of each Discussion section, no quiz during week FOLLOWING an exam
- All lab scores will be used in calculating your lab grade. No lab scores will be dropped. You must complete a MINIMUM of 8 labs to pass this course.
- Make-up exams, quizzes, and labs will be given only for excused absences consistent with University policies.
- Please give me your attention during lecture.
- I will do my best to start and end lecture on time.

Advice

The payoff for doing homework is a better understanding of the physics, improved problem solving skills and, consequently, higher quiz and examination scores. I HIGHLY recommend that you do all the homework and any supplementary problems.

Student Conduct

All students must be honest and forthright in their academic studies. Please see Rules and Responsibilities at University of Delaware for descriptions of what constitutes plagiarism, cheating, and academic misconduct. Students are also expected to abide by the Policy for Responsible Computing.

Important dates

Feb. 7 - 9: No labs or discussion sections; 1st homework is assigned
Feb. 12 -16: Lab sections begin meeting; also 1st homework due on Monday 10:10am and 1st quiz in DSC
Feb. 16: Last day to register or to add/drop courses without $$$ penalty

March 16: Friday, 1st exam
Mar. 26 – Mar. 30: Spring Break
April 2: Classes Resume
April 9: Last day to change registration or withdraw without academic penalty

April 27: Friday, 2nd exam
May 16: Last class day

revised March 5, 2007