

SYLLABUS FOR ECE 109 - LINEAR RESISTOR CIRCUITS

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OFFICE HOURS Announced in class

COURSE DESCRIPTION

In order to be able to design, debug and troubleshoot circuits we first have to be able to analyze them - figure out what they do and how they do it. The goal of the circuit classes ECE 109, 207 and 209 is to lay the foundation for this analysis. The main goal of ECE 109 in particular is to give you a thorough understanding of basic linear resistor circuit analysis with constant as well as time-varying inputs. It is also a main goal of this class that you learn to write good clear, easy to follow problem solutions that make it obvious "at a glance" what each problem is, how you're solving it and what your answer is.

CONCURRENT LAB: ECE109L. **PREREQUISITE:** Math 114.

TEXT: Nilsson

COURSE ORGANIZATION

1. **WAKEUP QUESTIONS** - Each class period will begin with a question - a question that is designed to be straightforward if you've done the day's investigation.
2. **TRANSITION LECTURES** - After the Wakeup Question there'll be a "Transition Lecture" summarizing where we've been, where we are and where we're going.
3. **INVESTIGATIONS** - After the Transition Lecture the class will break up into groups of about four to discuss and correct the day's Investigation. Each such Investigation is a series of problems designed to provide a "guided tour" of the day's material. This way of teaching is based on the belief that we learn more from the feedback we get when we're actively participating in solving problems than when simply listening to lectures. An investigation will be due at the beginning of each class period. Each one should take you about two hours. All work done on the Investigations before class is to be done in pencil; all work done in class in blue pen and all corrections done after being returned in red pen.
4. **CHECKLISTS** - Every Investigation must include a checklist verifying that the Investigation is in the correct format with solutions that are clear, legible and easy to follow - solutions that make it obvious "at a glance" what each problem is, how you're solving it and what your result is. The checklist form also has a time log. The idea for a time log comes from the Harvard Assessment Report on Teaching which found that students who consciously budget their time invariably do better.
5. **NUTS AND BOLTS QUESTIONS** - I will periodically interrupt the group discussions to ask a question for you to first work on alone and then discuss with your group before turning in. I will then go over the answer. These questions give both you and me the feedback we need to know how well the material is being understood.

6. **ANSWERS TO INVESTIGATION PROBLEMS** - At the end of each class period I will give answers to the Investigation Problems.
7. **FINAL ESSAY** - Everyone is required to write a one page essay at the end of the quarter in the form of a letter to a friend that summarizes the main results of the class, what prerequisites are really important, what key ideas and concepts should be learned cold and how in general to do well in the class.
8. **CULTURE ASSIGNMENT** - Scientists and engineers should, at the very least, be the best sources of information they can be as society grapples with how to best make use of technology. To help you broaden your outlook on the world - to better see both the pros and cons of technology - I ask you to read at least one essay from *The Medusa and The Snail* by Lewis Thomas. This book is in the reserve book room of the library. You are only being asked to read a few pages in the book - but with the hope that you'll read more.
9. **NOTEBOOKS** - Keep all class handouts and returned worked in an accopress binder (Senior Project Binder). These notebooks will be graded on organization, neatness, completeness and your correcting of returned work in red ink. These notebooks must contain the following items in the following order with dividers as indicated
 - Title Page with your name
 - Syllabus
 - Culture Assignment - divider
 - The results from the Investigations that are supposed to be memorized - divider
 - Your class notes - divider
 - Table of Contents for Investigations
 - Printed copies of Investigations handed out in class - divider
 - Your Investigations - each one followed by that day's Wakeup and Nuts and Bolts Questions. Put dividers between major sections as indicated in the Table of Contents
 - Exams

GRADING

My goal is to make grading as non-invasive as possible but points will be given as follows:

- Wakeup Questions - 3 each points each based on effort
- Homework - 4 points each based on format and effort
- Three Quizzes - 20 points each
- Notebooks - 30 points
- Final Essay - 10 points
- Midterm and Final - 100 points each

DROPPING

Note that Engineering students cannot drop classes after the third week unless there are documented extenuating circumstances. See the College of Engineering policy.