EE225 ELECTRICAL CIRCUITS
Fall 2013

Instructor : Onur Kaya
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Office hours: Monday 3 (13.00-14.00), and by appointment.

Class hours:
Lectures:
- Section 01 - Wednesday 7-8 (15.00-17.00), Thursday 1 (9:00-10.00)
- Section 02 - Monday 1-2 (9.00-11.00), Thursday 2 (10.00-11.00)

Problem Session:
- Section 01 - Friday 4 (12.00-13.00)
- Section 02 - Friday 5 (14.00-14.00)

Teaching Assistant: Doğan Kırcalı

Course Description:
Circuit variables. Circuit components (2-terminal and multi-terminal). Linear graph theory; postulates of circuit theory. Circuit analysis methods. State equations. Natural and particular solutions. Sinusoidal steady-state analysis of electrical circuits. Operational amplifier, mutual inductance, transistors.

Textbook:
Electric Circuits, James W. Nillson-Susan A. Riedel, 9th Edition, Prentice Hall, 2011.
Recommended for additional reading: R.C. Dorf and J.A. Svoboda, "Introduction to Electric Circuits", 7th edition, Wiley 2006

Course Objectives:
The goal of this course is to provide students with the fundamentals of circuit theory and analysis. In particular, the course introduces the concepts of ideal circuit components, resistive circuits, techniques of circuit analysis, power storage elements, RLC circuits, and sinusoidal steady state analysis. We emphasize the relationship between conceptual understanding and problem-solving approaches. The course introduces students to real-life circuit design problems that are solved using the basic tools of circuit analysis. Different concepts of circuit theory are built on top of each other, and much attention is paid to helping students understand how these concepts fit together.

Exams and Grading Policy :
All exams will be closed book and closed notes exams. You are not allowed to bring anything to the exam, except a calculator. Note that, the exams will all be on Monday evenings from 17:00 to 19:00. Please plan accordingly.

Midterm 1 (%30) :Mon, Nov 4th, 2013 (17.00-19.00)
Midterm 2 (%30) :Mon, Dec 16th 2012 (17.00-19.00)
Final (%40) :TBD

Make-up Policy :
There will not be any make-ups for the midterms. If you are able to formally document your excuse, and it is accepted, the percentage of the missing midterm will be added to your remaining exams (only those after the date of the missing midterm) in the semester. Make up policy for the final will follow university regulations.

Topics:

Week	Topics
1	Circuit variables. Ideal circuit elements, voltage and current sources, dependent sources.
2	Kirchhoff's Voltage Law and Kirchhoff's Current Law.

3	Resistors and Ohm's Law. Analysis of Simple Resistive Circuits. • Resistors in Parallel, • Resistors in Series, • The Voltage Divider and The Current Divider Circuits, • Wye-to Delta Transformation.
4	Techniques of Circuit Analysis : Node-Voltage Method, Mesh Current Method.
5	Principles of Superposition, Source Transformations Thevenin and Norton Equivalents. Maximum Power Transfer.
6	Operational Amplifiers
7	Inductors, Capacitors, Series-Parallel Combinations of Inductance and Capacitance
8-9	First Order Circuits, Natural and Forced Responses
10-11	Special Second Order Circuits : Parallel RLC and Series RLC Circuits, Their Natural and Forced Responses.
12-14	Sinusoidal steady state analysis