ECE U400 Linear Circuits, Spring 2005
School of Electrical and Computer Engineering
Northeastern University

Instructor:

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Office Hours: Tu 2-3pm, W 3:20pm-4:20pm, Fri 10:30am-11:30am

Interactive Learning Session (ILS) – ECE U401:

Day & Time: Tuesdays 8am-9am
Location: 9 Hayden Hall

Class Hours and Location:

4:35pm-5:40pm MWTh, 429 Ryder Hall

Course Description:

Introduces the basic laws and basic signal & device models used in the study of linear circuits. Topics include basic circuit analysis with resistive networks including nodal & mesh analysis, and the Thevenin & Norton theorems. Introduces three-terminal and dependent source models including the ideal operational amplifier model. Discusses common signal models including step functions, and the analysis of first- and second-order circuits and the solution of related differential equations. Considers circuits in the sinusoidal steady state using phasor representation. Presents the unilateral Laplace transform as a technique for solving differential equations with initial conditions that model linear circuits behavior, and introduces Laplace transform equivalent circuit models. Introduces frequency-domain circuit analysis and s-domain analysis including pole/zero plots and transfer functions.

Prerequisites and/or Corequisites:

Courses: Math U343, Physics U155

Topical: Complex numbers (rectangular and polar notation), solve system of n linear equations in n unknowns via Cramer's rule, and the ability to manipulate/solve both using a scientific calculator**. Strong knowledge of elementary differential and integral calculus. General knowledge of 1st and 2nd order differential equations.

**A good scientific calculator (ex: TI-89) that can perform complex arithmetic and manipulate matrices (and/or solve a set of linear equations) containing complex numbers is *highly* recommended. This will save you a great deal of time on both homeworks and examinations. Please note that *only* a calculator and pencil will be permitted on exams: no PDA's, cell phones, MP3 players, etc. are allowed.

Textbooks:

[1] "Introductory Circuits for Electrical & Computer Engineering," by James Nilsson & Susan Riedel, Prentice Hall, 2002. On reserve at Snell Library. (Required)

[2] "Introduction to PSpice Manual v9.2," by Nilsson & Riedel, Prentice Hall, 2002. (Optional)

[3] "Schaum's Outline of Electric Circuits, 4th edition," by Mahmood Nahvi & Joseph A. Edminister, McGraw-Hill, 2002. (Optional)

Reference Books (on reserve at Snell Library):

[1] "Electric Circuits, 7th edition," by James Nilsson & Susan Riedel, Prentice Hall, 2005.

[2] "The Analysis and Design of Linear Circuits, 4th edition" by Roland E. Thomas & Albert J. Rosa, John Wiley & Sons, 2003.

Grading Policy:

Homework:	10%, due at the beginning of class on due date
Exams:	55%, extended-time given: **see schedule below**
Final Exam:	35%, comprehensive

- 6 lowest homework problems will be dropped. Lowest exam will be dropped.
- No late homeworks will be accepted after solutions have been handed out and/or posted on the class website. No make-up examinations will be given.
- Calculators will be allowed (and encouraged) on all exams and final.
- Pop quizzes may be given in class at any time, thus regular class attendance is strongly recommended. Quiz scores will be combined with the homework scores.

Examination dates:

Exam #1:	February 10, 2005,	2:50pm-4:30pm,	220 Shillman Hall
Exam #2:	March 17, 2005,	2:50pm-4:30pm,	220 Shillman Hall
Exam #3:	April 7, 2005,	2:50pm-4:30pm,	220 Shillman Hall
Final Exam:	April 14, 2005,	1pm-3:30pm,	Room: TBD

Email and Course Web Page:

- **You are required to send me an email with your legal name (and preferred name, if applicable), email address, and course title (ECE U400) no later than 1/07/2005 so that I can construct an email list for this class.**
- All students are required to check their email everyday for any class updates or notices.
- Any changes or updates to the class syllabus or schedule will also be posted on the class website. Copies of homeworks, exams, and solutions will be posted there as well.

Special Needs:

Any student requiring any special accommodations because of a disability, please see me during office hours or send me an email immediately so that appropriate arrangements can be made. If special testing arrangements are required, you must bring your DRC letter to me immediately so that examination rooms can be reserved on your behalf.

Honors Adjuncts:

If you are in the University Honors Program and would like to enroll in the Honors Adjunct for this course, please send me an email immediately. The requirements for the honors credit will either be emailed to you, or I will set up a time to meet with you individually to discuss the requirements.