EECS 215: Introduction to Electronic Circuits
Winter Semester 2010

Instructors:

Section 1: 9:30-10:30 AM, MWF and 1:30-2:30 PM, F,
Prof. Fred Terry
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(Please include "EECS215" in the subject line)
763-9764

Section 2: 1:30-2:30 PM, MWF and 9:30-10:30 PM, F,
Prof. L. Jay Guo
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Chief Lab Instructor:

Dr. Alexander Ganago
3120 EECS Bldg.
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Text Books:

1 **Circuits**, Ulaby and Maharbiz, NTS Press (ISBN 978-1-934891-00-1). REQUIRED TEXT.

2 **Circuits Make Sense: A New Lab Book for Introductory Courses in Electric Circuits,** Alexander Gango, 6th Edition (ISBN 9780470896204). **REQUIRED LAB TEXT.**

Computing Resources and Skills:
You must have access to a computer running MATLAB (CAEN workstations or any PC running the Student Edition of MATLAB or better). Only very basic MATLAB knowledge will be necessary. Specific examples will be given in the lab materials. MATLAB 7 is preferred.

Multisim software, which is available on the DVD-ROM accompanying the text, will be used in lectures to check problem solutions. However, it will not be allowed on exams and it cannot be used as the primary method for problem solutions on homeworks unless explicitly indicated.

Office Hours: Office hours for all instructional staff will be announced during the second week of classes, and may be adjusted several times during the semester. This schedule will be posted on the course website.

E-mail Questions: Include "EECS215" in the subject line for faster responses (otherwise you risk the message getting buried in the daily e-mail flood).

Course Description Catalog: Prerequisite: Math 116 preceded or accompanied by PHYS 240 or (260). Cannot receive credit for both EECS 314 and EECS 215. I, II (4 credits)

Introduction to electronic circuits. Basic Concepts of voltage and current; Kirchhoff's voltage and current laws; Ohm's law; voltage and current sources; Thevenin and Norton equivalent circuits; DC and low frequency active circuits using operational amplifiers, diodes, and transistors; small signal analysis; energy and power. Time- and frequency-domain analysis of RLC circuits. Basic passive and active electronic filters. Laboratory experience with electrical signals and circuits.

Additional Comments: In this class you will acquire the basic tools for analyzing electronic circuits (and many other physical systems). These tools alone will not make you a great circuit designer, but without them; you cannot become a great designer. It is analogous to becoming fluent in a language. Here, you will learn the basic syntax and some vocabulary, but will not become a great French poet by taking French 101(but try it without it!). Additional classes are needed (such as 311 & 312) to really become a good designer, but the key concepts in EECS 215 will help provide a basis for the more advanced electronic circuits classes and will give some level of appreciation for the circuit design discipline for those who choose different areas of concentration in EE and CE.

The labs will help you develop practical skills and to connect classroom "theory" with the "real world." They are designed to be both educational and often fun, but are aimed first at educating future engineers, not aimed at training future technicians; therefore, some lab exercises may be basic in nature.

Grading:

Labs	**20%**
Homework	**15%**
Quizzes/In class events	**10%**
Midterm Exams	**30%**
Final Exam	**25%**

Homework assignments may be done with partners, but you are warned that failure to work enough significant problems on your own will almost certainly result in poor exam scores. Overt, mindless duplication (including photocopying) will result in no credit for the assignment.

Midterm and final exams will be given under the CoE Honor Code and will require individual efforts. The exams will be closed book. Basic scientific/engineering calculators will be required for the exams, but no use of laptop or higher level computers will be allowed on the exam. Calculators capable of performing complex matrix math are recommended (TI-89 or similar class). Use of any form of communication (wireless or otherwise) during exams will constitute an Honor Code violation. The class will ***NOT*** be graded "on-the-curve." You will be competing against your potential, not against other students.

Late policy, exam absence: No late homeworks will be accepted!!! Your lowest homework score will be dropped in determining your average homework score. If you miss a homework assignment due to a medical or approved excuse, this homework will be dropped from your score. If you have an exam conflict, you need to speak with an instructor at least one week in advance. If you miss an exam, real documentation is required stating why you could not attend (medical or close family member crisis). Documentation must clearly indicate why you were unable to attend the exam (a general doctor or UHS visit note is ***NOT*** sufficient; documentation must clearly state the reason(s) you were unable to take the exam).

EECS 215 – Electronic Circuits Winter 2010 Syllabus

Date		Reading	Lecture Topic	Homework Set Due	Lab
Wed.	Jan. 6	Chapter 1	Intro, Mechanics, Circuit Terminology		
Fri. AM	Jan. 8	Chapter 1	Circuit Terminology		
Fri. PM	Jan. 8	Sec. 2-1 & 2-3	Ohm's and Kirchhoff's Laws		
Mon.	Jan. 11	Sec. 2-4 & 2-5	Equivalent Circuits		
Wed.	Jan. 13	Sec. 2-6 & 2-7	Wheatstone, non-linear devices		
Fri. AM	Jan. 15	Sec. 2-8	Multisim	1	
Fri. PM	Jan. 15	Sec. 3-1	Nodal Analysis I		
Mon.	Jan. 18		MLK Day No Class Monday, Labs start Tuesday		Lab 1
Wed.	Jan. 20	Sec. 3-1	Nodal Analysis II		Lab 1
Fri. AM	Jan. 22	Sec. 3-2	Mesh Analysis I	2	Lab 1
Fri. PM	Jan. 22	Sec. 3-3	Mesh Analysis II		
Mon.	Jan. 25	Sec. 3-4 & 3-5	"By Inspection" and Examples		
Wed.	Jan. 27	Sec. 3-6 & 3-7	Superposition and Thevenin I		
Fri. AM	Jan. 29	Sec. 3-6 & 3-7	Thevenin II, Special Topics	3	
Fri. PM	Jan. 29		Examples, Multisim		
Mon.	Feb. 1	Sec. 3-8	Max. Power, BJT		Lab 2
Wed.	Feb. 3	Sec. 4-1 & 4-2	Op-amps		Lab 2
Fri. AM	Feb. 5	Sec. 4-3 & 4-4	Inverting amps	4	Lab 2
Fri. PM	Feb. 5	Sec. 4-5 to 4-7	Sum, difference amps		
Mon.	Feb. 8	Sec. 4-8 to 4-10	Instrumentation amp, DAC		
Wed.	Feb. 10	Sec. 4-11	MOSFETs		
Fri. AM	Feb. 12	Sec. 4-12 & 4-13	Multisim	5	
Fri. PM	Feb. 12		Linear Ordinary Differential Equations: Basic Concepts		
Mon.	Feb. 15	Sec. 5-1	Nonperiodic Waveforms		
Wed.	Feb. 17	Sec. 5-2 & 5-3	C and L		
Fri. AM	Feb. 19		**MIDTERM I 9-10:30 AM**		
Fri. PM	Feb. 19	Sec. 5-4 & 5-5	First Order Circuits RC, RL		
Mon.	Feb. 22	Sec. 5-6 to 5-8	RC Op-amp, Multisim		Lab 3
Wed.	Feb. 24	Sec. 6-1 & 6-2	Initial/Final Conditions		Lab 3
Fri. AM	Feb. 26	Sec. 6-3 & 6-4	Second Order Circuits: RLC Circuits I	6	Lab 3
Fri. PM	Feb. 26	Sec. 6-3 & 6-4	Examples, Op-Amp Stability		
Mar 1 – 5 Spring Break Stay Safe / Recharge for the rest of semester!					

Date	Reading	Lecture Topic	Homework Set Due	Lab	Date
Mon.	Mar. 8	Sec. 6-5 & 6-6	Second Order Circuits: RLC Circuits II, General Second-order Circuits I		
Wed.	Mar. 10	Sec. 6-5 & 6-6	General Second-order Circuits II		
Fri. AM	Mar. 12	Sec. 6-7	Laplace/S-Domain Methods	7	
Fri. PM	Mar. 12	Sec. 6-8	SOC Examples, Multisim		
Mon.	Mar. 15	Sec. 7-1 & 7-2	Sinusoids		
Wed.	Mar. 17	Sec. 7-3 & 7-4	Phasor Analysis		
Fri. AM	Mar. 19	Sec. 7-5 & 7-6	Impedance	8	
Fri. PM	Mar. 19		Examples, Midterm Review		
Mon.	Mar. 22	Sec. 7-7 to 7-9	Phasor Techniques		Lab 4
Wed.	Mar. 24	Sec. 7-10 to 7-11	Multisim		Lab 4
Fri. AM	Mar. 26		**Midterm II I 9-10:30 AM SHARP**		Lab 4
Fri. PM	Mar. 26		Exercises and Special Topics		
Mon.	Mar. 29	Sec. 8-1	Periodic Waveforms		
Wed.	Mar. 31	Sec. 8-2 to 8-4	AC Power		
Fri. AM	Apr. 2	Sec. 8-5 & 8-6	Max Power, Three Phase	9	
Fri. PM	Apr. 2.		Exercises and Special Topics		
Mon.	Apr. 5	Sec. 8-7	Power examples, Multisim		Lab 5
Wed.	Apr. 7	Sec. 9-1	Transfer functions		Lab 5
Fri. AM	Apr. 9	Sec. 9-2 & 9-3	Bode Plots	10	Lab 5
Fri. PM	Apr. 9	Sec. 9-4 & 9-5	Passive Filters		
Mon.	Apr. 12	Sec. 9-6	Active Filters		Lab 6
Wed.	Apr. 14	Sec. 9-7 & 9-8	Superhet receiver		Lab 6
Fri. AM	Apr. 16	Sec. 9-9	Filter Examples, Multisim	11	Lab 6
Fri. PM	Apr. 16		Exercises and Special Topics		
Mon.	Arp. 19		Review for Final Exam		

Exam Schedule:

Exam	Date	Time	Location
Midterm 1	Friday Feb. 19	9:00-10:30AM (not 9:10!)	TBA
Midterm 2	Friday Mar. 26	9:00-10:30AM (not 9:10!)	TBA
Final Exam	Monday, April 26	7:00-9:00pm (not 7:10!)	TBA