

CASE WESTERN RESERVE UNIVERSITY
Case School of Engineering
Department of Electrical Engineering and Computer Science
PRELIMINARY
ENGR 210. Introduction to Circuits and Instruments (4)
Spring 2004 Course Information

Summary Description:

Modeling and circuit analysis of analog and digital circuits. Fundamental concepts in circuit analysis: voltage and current sources, Kirchhoff's Laws, Thevenin and Norton equivalent circuits, inductors capacitors, and transformers. Modeling sensors and amplifiers and measuring DC device characteristics. Characterization and measurement of time dependent waveforms. Transient behavior of circuits. Frequency dependent behavior of devices and amplifiers, frequency measurements. AC power and power measurements. Noise in real electronic systems. Electronic devices as switches. Digital logic circuits. Introduction to computer interfaces. Analog/digital systems for measurement and control.

Prerequisite: MATH 122. *Co-requisite:* PHYS 122.

Required Textbook: The Analysis and Design of Linear Circuits, 4th Ed., R. Thomas and A. Rosa, Wiley, 2004, ISBN 0-471-27213-2.

Lecture Schedule: MWF from 9:30 - 10:20 am in Rockefeller 301.

Instructor: Prof. Frank Merat, Glennan 518, x4572 ([flm](#))

Instructor Office Hours: see <http://eecs.cwru.edu/courses/engr210/profhours.htm>

Lab Instructors: Mark Zurcher ([maz4](#)), Craig Birkhimer ([ceb](#)), David Young ([dly](#))

Lab Hours: see <http://eecs.cwru.edu/courses/engr210/labhours.htm>

Teaching Assistants: Bryan Inderhees ([bpi](#)), Run Wang ([rxw54](#)), Chad Simpson ([cxs101](#))

TA Office Hours: see <http://eecs.cwru.edu/courses/engr210/tahours.htm>.

Handouts: handouts will be posted at <http://eecs.cwru.edu/courses/engr210/> under "Class Info".

Basis of Grades

Homework (25 %): Homework assignments will be posted on Wednesday mornings and collected on the following Wednesday during lecture. Students may work together on homework assignments, but each student is required to turn in his/her own work.

Quizzes (25 %): Quizzes will be given in lectures on Friday mornings, and are based on the homework collected on Wednesday. Quizzes are closed book, and students must work alone. Calculators are generally not required. If used, they must be cleared of all programs and/or data before the quiz.

Laboratory (25 %): The laboratory for ENGR 210 is located in Glennan 308. Labs will be done in groups of two. *Students must attend regular lab sessions*, but labs may be completed during open lab hours. Lab reports, one per group, must be completed in a one-week period and turned in to the lab instructor during the regularly schedule lab period. The laboratory requires key card access and workstation accounts, which will be provided based on the class roster.

Final Exam (25 %): The final exam will be given on May 4th, from 8:30-11:30 am. The exam is closed book, students must work alone, and calculators must be cleared of all programs and/or data before the exam.

Late Policy and Missed Assignments

Assignments are due in lecture/laboratory on the specified date. No late assignments are accepted, but the lowest 2 HW/Quiz/Lab scores will be ignored, one from each half of the semester. As per University policy, the Final Exam is absolutely required.

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Spring 2004 Agenda and Assignment Dates

Notes:

1. Labs are posted on MON mornings and reports are collected the following week, at scheduled lab times.
2. HW is posted and collected on WED mornings (in lecture), and solutions are posted on WED afternoons.
3. Quizzes are given on FRI mornings (in lecture), and solutions are posted on FRI afternoons.
4. Reading is from The Analysis and Design of Linear Circuits, 4th Ed., Thomas and Rosa, Wiley, 2004.

Date	Class	Due	Agenda	Reading	Lab
1/12	1		Course Overview	1.1	
1/14	2		Introduction	1.2-3	intro
1/16	3		Basic Circuit Analysis	2.1-2	
1/19			Martin Luther King Day		
1/21	4	HW1	"	2.3	L1
1/23	5	Q1	"	2.4	Ohm's Law
1/26	6		"	2.5	L2
1/28	7	HW2	"	2.6	Computer-based
1/30	8	Q2	Circuit Analysis Techniques	3.1	Instruments
2/2			"	3.2	L3
2/4	10	HW3	"	3.3	DC Instruments
2/6	11	Q3	"	3.4	
2/9	12		"	3.5	L4
2/11	13	HW4	Active Circuits	4.1	AC Instruments
2/13	14	Q4	"	4.2	
2/16	15		"	4.4	L5
2/18	16	HW5	"	4.5	Operational
2/20	17	Q5	"		Amplifiers
2/23	18		"	4.6	L6
2/25	19	HW6	"		Digital Logic
2/27	20	Q6	"	4.7	
3/1	21		Signal Waveforms	5.1	L7
3/3	22	HW7	"	5.2	Exponential
3/5	23	Q7	"	5.3	Waveforms
3/8			Spring Break		
3/10	24		"	5.4	none
3/12	25		"	5.5-6	
3/15	26		Capacitance and Inductance	6.1	L8
3/17	27	HW8	"	6.2	RC Oscillators
3/19	28	Q8	"	6.3	
3/22	29		"	6.4	L9
3/24	30	HW9	1st and 2nd-order Circuits	7.1	Data Converters
3/26	31	Q9	"	7.2	
3/29	32		"	7.3	L10
3/31	33	HW10	"	7.4	Sampling and
4/2	34	Q10	Sinusoidal Steady State	8.1	Aliasing
4/5	35		"	8.2	L11
4/7	36	HW11	"	8.3	Passive RC
4/9	37	Q11	Frequency Response	12.1	Filters
4/12	38		"	12.2	L12
4/14	39		"		Active RC Filters
4/16			2nd-order Circuits (Revisited)	7.5	
4/19	40	HW12		12.3	
4/21	41		"		wrap-up
4/23	42	Q12	"		
4/26			Review and Course Evaluations		
4/27,28			Reading Days		
5/4			Final	8:30 - 11:30 am	

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Recitation Schedule: Thursday from 6:30 - 8:00 pm (Location TBD)

Lab Schedule	Lab Assistants
M 0330-0530	Dave Young & Craig Birkheimer
M 0700-0900	Mark Zurcher & Craig Birkheimer
T 0245-0445	Mark Zurcher & Craig Birkheimer
T 0700-0900	Dave Young & Craig Birkheimer
W 0330-0530	Dave Young & Mark Zurcher
W 0700-0900	Mark Zurcher & Dave Young

Course Web Page: <http://www.eecs.cwru.edu/courses/engr210/>

Instructor: Prof. Frank L. Merat (responsible for lecture and overall course)

Office: Glennan 518

Voice: 216-368-4572

e-mail: flm@case.edu (Please use ENGR 210 in your subject)

Web: <http://vorlon.cwru.edu/~flm/flm/home.html>

Instructor Office Hours: see <http://eecs.cwru.edu/courses/engr210/profhours.htm>

Instructor: Prof. Warren L. Grill (responsible for labs)

Office: Wickenden 114

Voice: 216-368-8625

e-mail: wmg@case.edu

Web: <http://www.cwru.edu/groups/ANCL/grill.html>

Instructor Office Hours: see <http://eecs.cwru.edu/courses/engr210/profhours.htm>

Lab Instructors:

Mark Zurcher maz4@case.edu

Craig Birkheimer ceb@case.edu

David Young dly@case.edu

Lab Hours: see <http://eecs.cwru.edu/courses/engr210/labhours.htm>

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