LINEAR ELECTRONICS 221

Fall 2009

Text: Horowitz and Hill, The Art of Electronics 2nd ed, Cambridge
LabView , John Essick, Oxford

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Lecture #	Topic	Readings	Exercises
1	Ohm's law Power Potential diff. Kirchhoff's laws	P.1 to 8	1.1,1.2,1.5,1.6
2.	Use of Multisim to solve circuit problems	Multisim D.C. Analysis	handout
3.	Thevenin's Theorem	P.8-19	1.7,1.8,1.9 1.10
4.	cont. above		handout,
5.	Amplifiers and Feedback	P.232-234 P.175-177	
6.	OP-AMP	P.177-184	4.2,4.3
7.	OP-AMP analysis w/ Multisim		4.2,4.3
8.	OP-AMP behavior	P.189-195	handout
9.	INSTRUMENTATION OP-AMPS	P.421-427	handout
10.	**EXAM 1**		
11.	Control of voltage and current	**not in text**	handout, Bad circuits P.258,D,E
12.	CAPACITORS AND INTEGRATION	P.20-24 P.222-224	handout
13.	DIFFERENTIATORS	P.224	handout

14.	ANALOG COMPUTER	**AJP/vol.41 May 1973 P.623-630**	handout
15.	SIMULATION WITH MULTISIM		handout
16.	Semiconductors	**not in text**	
17.	Ideal Diode, Clipping and Clamping circuits	P.44-45 P.48-51	handout
18.	Real diodes, Absolute value Circuits, Peak Detectors	P.51-53 P.217-222	handout
19.	Log, Antilog & 4Q multipliers	P.213	handout
20.	A.C. Circuit Analysis	P.29-35	1.18,1.19,1.20
21.	Cont. above		handout
22.	Analysis w/ Multisim		handout
23.	Passive Filters & Phase Shifts	P.35-42	1.24,handout
24.	Fourier Analysis	**not in text**	handout
25.	FFT with PC:SOLVE	PC:SOLVE(FFT) P.1035-1038	handout
26.	Phase Sensitive Detectors	P.1031-1034	handout
27.	Impedance Bridge, Wein Bridge Oscillator	P.296-298	handout
28.	**EXAM 2**		
29.	Comparators	P.229-232	4.10
30.	Relaxation Oscillator	P.284-286	5.7

31.	The 555	P.286-291	5.8
32.	Active Filters Butterworth	P.263-280	handout
33.	cont. above		handout
34.	Power Supplies	P.44-48 P.326-335	6.5
35.	Regulators	P.341-368	6.6
36.	**EXAM 3**		
37.	Transistor	P.61-64	handout
38.	Hybrid Parameters	**not in text**	handout
39.	Transistor Amplifier (simple design)		Multisim handout
40.	Transistor Amplifier		
41.	cont. above		handout

Grades will be determined by 50% laboratory, 25 % hour exams and 25% final exam.
Attendance of lectures is important since new material, problem solutions, different approaches from that of the text and computer instructions will be presented during this time.
Students will have their own lab stations, work at their own pace and must complete all experiments. Laboratory attendance is required since explanations and procedures will be presented at the beginning of the laboratory period and can not be repeated.

Goals of the course

At the completion of the course, students should be able to:

- Analyze existing circuits as to function.
- Design, using integrated circuits, simple interfacing systems.
- Simulate circuit systems using the Multisim simulation program.
- Understand the choices one makes in designing a circuit.
- How to choose circuit configurations, device types and commercial instruments for experimental systems.
- How to calibrate and determine if commercial instruments are functioning as specified and possibly repair such instruments.
- Know how to program in LabView.