EE 322 Advanced Analog Electronics

Course title:
Advanced Analog Electronics

Instructor:
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Workman 227
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Class hours:
Monday, Wednesday 10:00-10:50
Wednesday 13:00-13:50
Occasionally Friday 10:00-10:50

Classroom location:
Speare 113
Workman 117
Speare 113

Laboratory hours:
Monday 14:00-16:45

Laboratory location:
Workman 189

Office hours:
Monday 13-14
Tuesday by appointment

Textbooks:

1. *Adel S. Sedra and Kenneth C. Smith*, Microelectronic Circuits, Fifth edition, Oxford University Press. (This is the textbook for EE 321)
2. *Paul Horowitz and Winfield Hill* , The Art of Electronics, Second edition, Cambridge University Press. (This book is available at the NMT bookstore)
3. *Ron Mancini, ed.*, Op Amps For Everyone, September 2001 edition. (This book is available as a pdf from the course website)

Learning objectives:

1. Apply basic concepts from previous courses to practical analog circuits and techniques.
2. Learn principles and good experimental technique through laboratory exercises.
3. Exposure to a selected variety of practical circuits.
4. Be able to use a new circuit or IC after reading the section in 'Horowitz and Hill' and the spec sheet.

Prerequisites:

EE 231 and EE 231L, EE 321 and 321L, EE 341.
EE 322 and EE 322L are integrated and must be taken together.

Topics covered:

1. Linear voltage regulators
2. Switching voltage regulators
3. Interference and grounding
4. Noise in circuits
5. Oscillators and comparators
6. Timers
7. Active filters
8. Phase-locked loops
9. Feedback op-amps and stability
10. Differential amplifiers

Course work:

1. Reading. You will be required to keep up with the course by reading the assigned sections in the books.
2. Homework. Assigned approximately weekly.
3. Laboratory exercise. Scheduled most weeks.
4. Tests. Three tests in class during the semester.
5. Final exam. During finals week.

Grading policy:

EE 322

1. Homework 40%
2. Total of four tets, three during semester, one during finals week. One of four dropped 60%

EE 322L

Please see specific instructions and grading information on laboratory exercises website.

Approximate Lecture Schedule:

Week of	Lecture	Exam	Laboratory Exercise
Jan 17	Voltage regulators		
Jan 24	Switching regulators		Circuit simulation
Jan 31	Switching regulators, grounding		Linear regulator
Feb 7	Oscillator		Switching regulator
Feb 14	Comparators	1	Sine oscillator
Feb 21	Timers, Oscillators		Comparators
Feb 28	Active filters		555 timer
Mar 7	RLC, VCVS		Matlab filters
Mar 14	**Spring Break**		
Mar 21	Phase-locked loops	2	Active filters
Mar 28	Phase-locked loops, Noise		Phase-locked loops
Apr 4	Voltage/current feedback op-amps		Noise
Apr 11	Differential pairs		Current Feedback
Apr 18	Differential amplifier		Discrete Op-amp - 1
Apr 25	Differential/multi-stage amps	3	Discrete Op-amp - 2
May 2	Review		
May 9		Final Exam	