

Syllabus

Spring 2012

EE60542 Analog Integrated Circuit Design

Instructor: Alan Seabaugh

Time TH 9:30-10:45

Class: Room 356A Fitzpatrick Hall

Website: Concourse

Prerequisite: Graduate standing or by permission

Textbook: Analog Integrated Circuit Design, T. C. Carusone, D. A. Johns, K. W. Martin
2012 Wiley, ISBN 978-0-470-77010-8

Description: This course teaches the design and analysis of transistor integrated circuits including amplifiers, current mirrors, frequency response, noise, feedback, stability, bandgap references, etc., with application to linear amplifiers and operational amplifiers. Students will use SPICE (simulation program with integrated circuit emphasis) for circuit design.

Homework: Homework will be due on Tuesdays at the beginning of class. Late homework will be accepted only under extraordinary circumstances. Open discussion of homework is fine, but turn in your own work. Assigned readings are to be completed prior to class on the date listed. Each student will grade or assist with the grading of one homework in the semester.

Class Participation: In class questions will be used to gauge mastery of readings and circuit concepts. To be exempt from questions in a given class, send an email message with PASS in the subject line prior to class. Each student can use up to two passes in the semester.

Grading: Homework (15%), class participation (5%), midterm (25%), design (25%),
final (30%).

Office hours: 4 – 5 pm Mondays, Fitzpatrick 230A, or stop in, or contact Heidi Deethardt to
arrange a time, hdeethar@nd.edu .

SPICE: AIM-SPICE will be used for circuit simulation; download at
www.aimspice.com.

EE60542 Schedule

Class	Date	Plan	Chapter	HW due
1	17-Jan	Introduction to Analog Design	1	
2	19-Jan	MOS device physics and models	2	
3	24-Jan	Current mirrors	3	HW1
4	26-Jan	Single stage amplifiers	3	
5	31-Jan	Cascode stage	3	HW2
6	2-Feb	Differential amplifiers	3	
7	7-Feb	Frequency resp. - class to be rescheduled	4	HW3
8	9-Feb	Frequency response of circuits	4	
9	14-Feb	Cascode gain stage - source follower	4	HW4
10	16-Feb	Differential pair	4	
11	21-Feb	Negative feedback	5	HW5
12	23-Feb	First and second order feedback	5	
13	28-Feb	Feedback amplifiers	5	HW6
14	1-Mar	Special topics	5	
15	6-Mar	Exam 1	1-5	
16	8-Mar	Op amps - class to be rescheduled	6	
	13-Mar	MIDSEMESTER BREAK		
	15-Mar	MIDSEMESTER BREAK		
17	20-Mar	no class - time to be used for design		HW7
18	22-Mar	reviews in the week 4/23-27		
19	27-Mar	Two-stage op amp and compensation	6	HW8
20	29-Mar	Advanced current mirrors	6	
21	3-Apr	Folded cascode	6	HW9
22	5-Apr	Fully differential op amps	6	
23	10-Apr	Biasing and references	7	HW10
24	12-Apr	Constant voltages and currents	7	
25	17-Apr	Voltage regulation	7	HW11
26	19-Apr	Noise and linearity analysis	9	
27	24-Apr	Noise analysis examples	9	Design
28	26-Apr	Dynamic range	9	Reviews
29	1-May	Wrap-up and review		HW12
	TBD	FINAL EXAM - comprehensive		