

Syllabus

Spring 2011

EE60542 Analog Integrated Circuit Design

Instructor: Alan Seabaugh

Time TH 9:30-10:45

Class: Room 204 DeBartolo Hall

Website: Concourse

Prerequisite: Graduate standing or by permission

Textbook: Design of Analog CMOS Integrated Circuits, Behzad Razavi
2001 McGraw-Hill, ISBN 0-07-238032-2

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 operational and power amplifiers, oscillators, and phase-locked loops. 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 with other students is accepted, but students must turn in their own work. Assigned readings are to be completed prior to class on the date listed. With the exception of the first reading assignment, a reading discipline of 4 pages per day will enable completion of the readings.

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 (10%), class participation (10%), exams (2 x 25%), final (30%).

Office hours: Mondays, 11a – Noon, or by appointment, Fitzpatrick 230A

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

EE60542 Schedule

Class	Date	Plan	Chapter	HW due	Reading due
1	18-Jan	Introduction to Analog Design	1		pp. 1-8
2	20-Jan	MOS device physics and models	2		9-38
3	25-Jan	Single stage amplifiers	3	HW1	
4	27-Jan	Common source	3		47-75
5	1-Feb	Common drain and common gate	3	HW2	
6	3-Feb	Cascode stage	3		76-93
7	8-Feb	Differential amplifiers	4	HW3	
8	10-Feb	Common mode rejection	4		100-129
9	15-Feb	Passive and active current mirrors	5	HW4	
10	17-Feb	Cascode current mirrors	5		135-158
11	22-Feb	Frequency response of amplifiers	6	HW5	
12	24-Feb	Miller effect, poles and zeros	6		166-195
13	1-Mar	Noise	7	HW6	
14	3-Mar	Representation of noise in circuits	7		
15	8-Mar	Exam 1	1-6		
16	10-Mar	Special topics			201-233
	15-Mar	MIDSEMESTER BREAK			
	17-Mar	MIDSEMESTER BREAK			
17	22-Mar	Feedback	8	HW7	
18	24-Mar	Feedback topologies	8		246-269
19	29-Mar	Case studies	8	HW8	
20	31-Mar	Loading in feedback circuits	8		270-285
21	5-Apr	Operational amplifiers	9	HW9	
22	7-Apr	Two stage op amps	9		291-316
23	12-Apr	Stability and frequency compensation	10	HW10	
24	14-Apr	Phase margin	10		345-373
25	19-Apr	Bandgap references	11	HW11	
26	21-Apr	Temperature independent references	11		377-400
27	26-Apr	Special topics		HW12	
28	28-Apr	Exam 2	7-11		
29	3-May	Wrap-up and review			
	TBD	FINAL EXAM	1-11		