EEL 5321 – CMOS Amplifiers (Spring 2009)

Course Calendar (Version 12.0 3/17/2009)

Wk	Date	Lect.	Topic	Razavi's Text	Comments
1	T 1/6	1	**Guest Speaker: Mr. Wilfredo Rivas-Torres (Agilent Technologies)** ADS Tutorial – basics; ADS Optimizer		
1	Th 1/8	2	**Guest Speaker: Mr. Wilfredo Rivas-Torres (Agilent Technologies)** Current Mirror Architectures; BSIM3 model acquisition for MOSFET in ADS	Ch. 5	
2	T 1/13	3	**Guest Speaker: Mr. Wilfredo Rivas-Torres (Agilent Technologies)** Basic MOSFET Device Physics: Level 1 model - V_{TH}, λ and Body Effect ; small-signal parameters; ADS DC Simulation of simple MOSFET circuits	Ch. 2	HW1 (DC Analysis of MOSFET circuits) given
2	Th 1/15	4	**Guest Speaker: Mr. Wilfredo Rivas-Torres (Agilent Technologies)** CS Amplifier with R_D load – design and ADS verification; Using ADS Optimizer for design of CS amplifier with R_D load	Ch.3	
3	T 1/20	5	CS Amplifier with Diode-Connected and Current-Source Loads	Ch. 3	HW2 (CS amplifier design with RD) given
3	Th 1/22	6	Systematic and Computer-Aided CS Amplifier Design using ADS Optimizer	Ch. 3	W. Rivas & Z. Roth
4	T 1/27	7	Source Follower Amplifier Analysis and Design	Ch.3	HW3 given (CS amplifier – optimizer) HW1 due Project options given
4	Th 1/29	8	ADS examples: CS amplifier with RL load, CS amplifier with source follower and RL load, Introduction to Harmonic Balance Analysis; Introduction to Sensitivity Analysis; Effects of HB and SA on Design with the Optimizer.	Ch. 3	W. Rivas & Z. Roth
5	T 2/3	9	General theoretical relationships derived for CS Amplifier with Source Degeneration; Common-Gate Amplifiers – Analysis and Design; Cascode Amplifiers - basics	Ch. 3	HW4 given (CS+CD)
5	Th 2/5	10	ADS: CG amplifier design, CS amplifier connected to load via transmission line, CS + transmission line + CG; Design of Cascode amplifier	Ch. 3	W. Rivas & Z. Roth
6	T 2/10	11	Differential Amplifiers – basics; Differential Amplifier – Differential and Common-Mode operation	Ch. 3	HW5 given (CG, Cascode) HW2 due
6	Th 2/12	12	ADS: Basic differential amplifiers	Ch. 4	W. Rivas &

			performance; Monte Carlo analysis		Z. Roth
7	T 2/17	13	Differential Pair with MOS and current mirror loads; Systematic Design of Differential amplifiers; Gilbert Cell – basic ideas	Ch. 4	HW6 given (Cascode, Differential Amplifiers) HW3 due
7	Th 2/19	14	ADS: Differential Amplifiers with MOS and current mirror loads	Ch.5	W. Rivas & Z. Roth
8	T 2/24	15	High Frequency Response of Amplifiers – basic concepts, Miller Effect; CS Amplifiers	Ch. 6	HW7 given (Design with BW specs) HW4 due
8	Th 2/26	16	Frequency Response of Source Follower, CG, Cascode and Differential Amplifiers and ADS demonstrations and comparisons	Ch. 6	W. Rivas & Z. Roth
9	3/2-3/8		**Spring Break**		
10	T 3/10	17	**Guest Speaker: Dr. Marty Gazourian** Introduction to OTA Active Filters		HW5 due
10	Th 3/12	18	ADS: OTA applications		W. Rivas & Z. Roth
11	T 3/17	19	OTA Applications		HW8 given HW6 due
11	Th 3/19	20	ADS: More OTA applications; ADS: Introduction to noise in amplifiers – thermal and flicker noise.	Ch. 7	W. Rivas & Z. Roth
12	T 3/24	21	Noise effects in amplifiers – Background, Noise Types, Noise Representation in Circuits	Ch. 7	HW9 given HW7 due
12	Th 3/26	22	Noise in Single Stage Amplifiers ADS: Noise in amplifiers – comparative analysis	Ch. 7	W. Rivas & Z. Roth
13	T 3/31	23	Feedback in CMOS amplifiers - basic concepts; Feedback Amplifier Types; Feedback Amplifier Analysis	Ch. 8	HW10 given HW8 due
13	Th 4/2	24	Multi-stage operational amplifiers; Compensation design for stabilizing a feedback multi-stage op-amp	Ch. 8, 9, 10	
14	T 4/7	25	CMOS Operational Amplifiers: Single and two stage structures	Ch. 9	HW11 given HW9 due
14	Th 4/9	26	ADS: Compensation of multi-stage operational Amplifiers	Ch. 10	W. Rivas
15	T 4/14	27	Operational Amplifiers: Common-Mode Feedback, Gain Boosting, Slew Rate	Ch. 9	HW10 due
15	Th 4/16	28	Switched-Capacitor circuits demonstration	Ch. 12	W. Rivas
16	T 4/21	29	Overview of CMOS process technology	Ch. 17	HW11 due
17	T 4/28		**(Final Exam cancelled)**		Project due