EE 135 - Analog Integrated Circuit Layout and Design

TECHNICAL ELECTIVE

4 units, 3 hours Lecture - 3 hours Laboratory
Prerequisites: EE 100a,b; EE120a,b: EE133, 134

This course covers CMOS integrated circuit design, layout and verification using the CADENCE CAD tools. Topics covered are CMOS fabrication and layout, digital models, inverters, static logic gates, transmission-gates, flip-flops, dynamic logic gates, and memory circuits.

Item	OUTCOME-RELATED LEARNING OBJECTIVES	OUTCOMES													
		1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	Understand basics of noise in resistors and MOSFETs.	3		2		1						3			
2	Ability to simulate MOS devices and CMOS circuits with SPICE: ac, DC, transients.			3		1						3			
3	Design and layout a common source amp.	1		3		1						3			
4	Design and layout a current mirror.	1		3		1						3			
5	Design and layout a differential amplifier.	1		3		1						3			
6	Design and layout an output buffer.	1		3		1						3			
7	Design and layout a CMOS op-amp.	1		3		1						3			
8	Understand and ability to simulate CMRR, PSRR, slew rate, frequency response, and power dissipation of CMOS op-amp.	1		3		1						3			
8															
8															
9															
10															
	SUBTOTALS	**9**	**0**	**23**	**0**	**8**	**0**	**0**	**0**	**0**	**0**	**24**	**0**	**0**	**0**

OBJECTIVE ADDRESSES OUTCOME: SLIGHTLY - 1, MODERATELY - 2, SUBSTANTIALLY - 3

Outcome 1: Ability to apply knowledge of mathematics, science, and engineering.
Outcome 2: Ability to design and conduct experiments, as well as analyze and interpret data.
Outcome 3: Ability to design a system, component, or process to meet desired needs.
Outcome 4: Ability to function on multidisciplinary teams.
Outcome 5: Ability to identify, formulate, and solve engineering problems.
Outcome 6: Understanding of professional and ethical responsibility.
Outcome 7: Ability to communicate effectively.
Outcome 8: Broad education necessary to understand the impact of engineering solutions in a global and societal context.
Outcome 9: Recognition of the need for and an ability to engage in lifelong learning.
Outcome 10: Knowledge of contemporary issues.
Outcome 11: Ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.
Outcome 12: *Optional - as determined by program.*
Outcome 13: *Optional - as determined by program.*
Outcome 14: *Optional - as determined by program.*