AAST - EC432 Microelectronics - Dr. Amr Bayoumi

	Topic	
Lec. 1	Review of BJT and MOSFET device physics and operation	
Lec. 2	Introduction to Differential Pairs: Current Biasing, Equilibrium biasing, Differential and common mode gain, CMRR	
Lec. 3	MOS differential pairs: Large signal analysis	
Lec. 4	Differential pairs: Small signal analysis of MOS	
Lec. 5	BJT Differential Pairs: Large & small signal analysis	
Lec. 6	Differential Active Loads: Ideal Current Sources as loads, Transistor Active loads, Differential-to-Single Conversion	
Lec. 7	Week 7 Exam	
Lec. 8	Op-Amp as a Block: Ideal Op-amp, Feedback using op-amp, Opamp-based amplifiers, integrators, differentiators	
Lec. 9	Non-Ideal Opamps: Offset voltage, Offset current, Slew rate	
Lec. 10	Circuits for Opamp Building Blocks: - Cascode configurations: output resistance, gain. - Current Mirrors: non-ideal rout, channel-length modulation effects, combinations of current NMOS (sinks) & PMOS (sources) mirrors	
Lec. 11	Building Blocks II: - Source Follower output stage: impedance matching - Improved current mirrors: Cascode - Miller Theory: use in analysis of parasitic capacitance	
Lec. 12	Week 12 Exam	
Lec. 13	Frequency Analysis I: (with Design Example) Pole-Time Constant Equivalence, Dominant pole analysis, Input and Output stage time constants Cascode as Improvement of Miller capacitance Deterioration of Output Stage time constant with Cascode Stage Small Rout Output Stages	
Lec. 14	Frequency Analysis II: - Stability: Gain and Phase Margin - Frequency Compensation using Miller Capacitance. - Effect of Feedback on Gain and BW	
Lec. 15	- Integration of overall opamp internal circuit	