ECE-UY-3124, Solid-State Electronic Devices and Circuits-II

Department of Electrical and Computer Engineering
Tandon School of Engineering, New York University

This course is the second part of the undergraduate Solid State Electronics Sequence, ECE-UY 3114-3124, for which ECE-UY-3114 is a pre-requisite. Following the BJT, FET device operation and circuit analysis already covered in ECE-UY-3114, this second part will cover differential amplifiers, current sources and output stages, which constitute the integral parts of the internal circuitry of an Op-Amp (Operational Amplifier). Positive feedback concepts and wave shaping circuits will then be covered, followed by digital circuits using MOS and bipolar technology.

Text: A. Sedra and K. Smith, *Microelectronic Circuits, 8th Edition (Latest)*, Oxford University Press, 2020.

Course Outline

Topics	Description	ESTIMATED LECTURE HOURS
1	Introduction, differential pair. Ch.9	8
2	Current sources, active loading, multistage amplifier. Ch. 8,9	6
3	Amplifier output stages (class A, B and AB output stages) Ch.12	8
4	Op-amp analog integrated circuits (dc and ac analysis of simplified op-amp). 9.6.2	4
7	Feedback amplifiers (Review, positive feedback and stability). Ch. 11	4
8	MOS digital circuits (inverter, noise margin, fan out, propagation delay, CMOS gates) Ch.5,7,16	8
9	Bipolar digital circuits. Ch.6,7	2
10	Wave shaping circuits (Monostable, astable and bistable) Ch.15, 18.4	8
	Examination	4
	TOTAL	52 hours

Fall 2020

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Lecture Hours: 6-7.50pm, Monday and Wednesday Rm 2MTC-845
Office Hour: Wednesday 5-6pm, or by appointment.

Total Course Grading: Theory part: 80%, Laboratory part (graded by lab instructor): 20%:
Grading for the Theory Part: Midterm: 30%, Homework and quiz: 20%, Final examination: 50%