BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE PILANI, HYDERABAD CAMPUS
INSTRUCTION DIVISION, SECOND SEMESTER 2020 – 2021
COURSE HANDOUT (PART II)

In addition to PART I (General Handout for all courses appended to the time-table), this portion gives further specific details regarding the course.

Course no. : ECE/EEE/INSTR F244

Course title : Microelectronic Circuits

Instructor In-charge : Dr. Parikshit Sahatiya

Team of instructors: (i) Lecture: Parikshit Sahatiya and Karumbaiah Chappanda Nanaiah
(ii) Tutorials : Parikshit Sahatiya, Karumbaiah Chappanda Nanaiah and Surya Shankar Dan

Scope and objective of the course:

(i) Analyze and design basic integrated electronic circuits.
(ii) Thorough understanding of fundamentals of electronic circuits & building blocks necessary for effective realizations of integrated circuits.
(iii) The course also includes the practical component under ECE/EEE/INSTR F246.

Text book: [T1] A. S. Sedra & K. C. Smith, "Microelectronic Circuits", Oxford University Press, 7th ed.

Reference books: [R1] B. Razavi, "Fundamentals of Microelectronics", Wiley.
[R2] D. A. Neamen, "Electronic Circuits – Analysis and Design", McGraw Hill, 3rd ed.
[R3] R. T. Howe & C. G. Sodini, "Microelectronics – An Integrated Approach" Pearson.
[R4] J. Millman & A. Grabel, "Microelectronics", Tata McGraw Hill, 2nd ed.

Course Roadmap:

#	Topics to be covered	Learning Objective	# of lec	References
1	Introduction	Semiconductor basics	2	T1: 1.7 – 1.11
2	Models and physics of BJT + DC analysis	BJT device physics	5	T1: 4.1 – 4.4 T1: 6.2. – 6.5 (6.4 is for biasing and DC Analysis)
3	BJT Amplifiers	Discrete BJT Amplifier design	5	T1: 6.2 – 6.5
4	Models and physics of MOSFET	MOS device physics	3	T1: 5.1 – 5.4
5	MOSFET Amplifier	Discrete MOSFET Amplifier design	5	T1: 6.2. – 6.5
6	Frequency response	Low and High frequency response (BJT and MOSFET)	4	T1: 9.1 – 9.7
6	Passive and active current mirrors	Design of IC bias circuits	3	T1: 7.2
7	Feedback and Stability study in BJT and MOSFET circuits	Study of feedback and Stability	4	T1: 10.1 – 10.10
8	Differential amplifiers	Design of differential amplifiers	4	T1: 8.1 – 8.6
9	Ideal Operational Amplifiers	Design and characterization of ideal OP-AMP circuits	3	T1: 2.1 – 2.9
10	Introduction to basic oscillators	Wien-Bridge, Hartley &Colpitt	3	T1: 14.1 – 14.3

		oscillator		
11	Introduction to basic filters	Butterworth & Chebyshev filters	2	T1: 13.1 – 12.3

Evaluation scheme:

#	Component	Duration	Weightage	Full marks	Date & time	Remarks
1	Quizzes/Assignments (Already conducted)	45 min each	25 %	75	To be announced later	Open book
2	Midterm (Already Conducted)	90 min	30 %	90		Closed book
3	**Comprehensive (Viva-Voce)**	**120 min**	**45 %**	**135**	**To be announced**	**Closed book**

Notices: **All notices for the course will be announced in class and displayed on the CMS simultaneously.

Makeup policy: Requests for makeup examination will be considered ONLY for extremely serious cases where:

(i) Parents of the concerned student have to request the course IC in a signed document for the makeup of their son/daughter.

(ii) Written & signed documentary evidence needs to be furnished by the Hostel Warden/ID confirming the reason for absence from scheduled examination.

(iii) In case of medical emergencies, students must produce a documentary evidence from the surgeon.

Chamber consultation hour: To be announced in class.

Instructor incharge
ECE/EEE/INSTR F244