

**BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE PILANI, HYDERABAD CAMPUS**  
**INSTRUCTION DIVISION, SECOND SEMESTER 2019 – 2020**  
**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 incharge** : Mr. Syed Ershad Ahmed

**Team of instructors:** (i) Lecture: Syed Ershad Ahmed and Karumbaiah Chappanda Nanaiah  
(ii) Tutorials : Syed Ershad Ahmed and Karumbaiah Chappanda Nanaiah

**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, 6<sup>th</sup>ed.

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

**Course Roadmap:**

#	Topics to be covered	Learning Objective	# of lec	References
1	Introduction to amplifiers, review of basic network theory, and feedback	Characteristic of amplifiers and feedback concepts	6	T1: 1.4 – 1.6 T1: 7.1 – 7.6
2	Ideal Operational Amplifiers	Design and characterization of ideal OP-AMP circuits	3	T1: 5.1 – 5.10
3	Models and physics of MOSFET	MOS device physics	2	T1: 4.1 – 4.6
4	MOSFET Amplifier and Frequency response	Discrete MOSFET Amplifier design	5	T1: 4.7 – 4.11
5	Models and physics of BJT	BJT device physics	2	T1: 3.1 – 3.6
6	BJT Amplifiers and frequency response	Discrete BJT Amplifier design	4	T1: 3.7 – 3.10
7	Feedback in BJT and MOSFET circuits	Study of feedback	3	T1: 7.1 – 7.11
8	Passive and active current mirrors	Design of IC bias circuits	4	T1: 6.3 – 6.14
9	Differential amplifiers	Design of differential amplifiers	5	T1: 8.1 – 8.7
10	Introduction to basic filters	Butterworth & Chebyshev filters	2	T1: 11.1 – 11.3
11	Introduction to basic oscillators	Wien-Bridge, Hartley & Colpitt oscillator	2	T1: 12.1 – 12.3

**Evaluation scheme:**

#	Component	Duration	Weightage	Full marks	Date & time	Remarks
1	Quizzes	40 min each	35 %	105	To be announced later	Open book
2	Midterm	90 min	30 %	90		Closed book
3	Comprehensive	180 min	35 %	105		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**