

**BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, PILANI, HYDERABAD CAMPUS**  
**INSTRUCTION DIVISION, SECOND SEMESTER 2023**  
**COURSE HANDOUT (PART II)**

Date:

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 F244 / EEE F244 / INSTR F244

**Course Title** : Microelectronic Circuits

**Instructor in charge** : SYED ERSHAD AHMED

**Team of Instructors**

**(i) For Lecture** : Syed Ershad Ahmed

**(ii) For Tutorial** : Syed Ershad Ahmed , Parikshit Sahatiya and  
Surya Shankar Dan

**1. Scope and objective of the course:**

- a. Analyze and design basic integrated electronic circuits.
- b. Thorough understanding of fundamentals of electronic circuits & building blocks necessary for effective realizations of integrated circuits.
- c. The course also includes the practical component under ECE/EEE/INSTR F246.

**2. Text Book:**

Adel. S. Sedra, Kenneth C Smith, "Microelectronic Circuits", Oxford University Press, Fifth Edition, 2004.

**3. Reference books**

- (i) Richard. C. Jaeger, "Microelectronic Circuit Design", Tata McGraw-Hill Companies Inc., International Edition.
- (ii) R.Jacob.Baker, Harry.W.Li, David.Boyce, "CMOS circuit Design Layout and simulation." IEEE Press series on Microelectronic Systems, PHI.

**5 Course Plan :**

S.No.	Topic	Learning Objective	No. of Lectures	Ref. From the Text Book (Article)
1.	Introduction to Amplifiers	Characteristic of Amplifiers	2	Text chapter-1 1.4, 1.5, 1.6
2	Models of MOSFET, physics of MOSFET	MOS device physics	2	Text ch- 4.1 – 4.3
3.	Integrated circuit MOSFET Amplifier circuits, and Frequency response	IC MOSFET Amplifier design	5	Text Ch 4--4.5, 4.6, 4.7, 4.8, 4.9
4.	Integrated circuit BJT Amplifiers, frequency response and BJT models	Discrete and IC BJT Amplifier Design (To be discussed in Flip mode using	5	Text Ch 5--5.5, 5.6, 5.7, 5.8, 5.9

		recorded videos)		
5.	Differential amplifiers	Design of differential amplifiers	7	Text --Ch.7.1-7.7
6.	Passive and active current mirrors.	Design of IC bias circuits	4	Text Ch.6.12
7.	Feedback	Study of feedback	7	Text Ch.8.1-8.7
8.	Operational Amplifiers	Design and characterization of an integrated circuit OP-AMP	5	Text Ch. 9
9.	Stability & frequency compensation in OP AMP, Noise	Techniques for stability of opamp in feedback mode.	3	Text ch-8.8-8.11
Total (40)				

#### 6. Evaluation Scheme:

#	Component	Duration	Weightage	Full marks	Date & time	Remarks
1	Quizzes	To be announced	35 %	70	To be announced later	Closed book
2	Midterm	90 min	35 %	70	17/03 2.00 - 3.30PM	Open Book
3	Comprehensive	120 min	30 %	60	18/05 FN	Closed book**

**\*\* Though comprehensive exam is closed book, one A4 handwritten (both sides) formula sheet will be allowed for entire duration of comprehensive exam. Only formulas in the sheet are allowed. Circuits, and any form of Figures, images not allowed.**

**7. Chamber Consultation Hour:** To be announced in the class

**8. Make-up Policy:** Requests for makeup examination will be considered ONLY for extremely serious cases where:

- Parents of the concerned student have to request the course IC in a signed document for the makeup of their son/daughter.
- Written & signed documentary evidence needs to be furnished by the Hostel Warden/ID confirming the reason for absence from scheduled examination.
- In case of medical emergencies, students must produce a documentary evidence from the doctor.

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

**Instructorincharge**  
**ECEF244 / EEE F244/ INSTR F244**