BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, PILANI, HYDERABAD CAMPUS
INSTRUCTION DIVISION, SECOND SEMESTER 2024
COURSE HANDOUT (PART II)

Date: 09-01-2024

In addition to partI (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**
Instructorincharge : **SYED ERSHAD AHMED**
Team of Instructors
(i) For Lecture : **Syed Ershad Ahmed, Niranjan Raj**
(ii) For Tutorial : **Syed Ershad Ahmed , Parikshit Sahatiya , Surya Shankar Dan and Niranjan Raj**

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 recorded videos)	5	Text Ch 5--5.5, 5.6, 5.7, 5.8, 5.9

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	30 %	60	To be announced later	Closed book
2	Midterm	90 min	30 %	60	12/03 - 11.00 - 12.30PM	Open Book
3	Comprehensive	180 min	40 %	80	09/05 FN	Closed book**

**** Though comprehensive exam is closed book, <u>one A4 handwritten</u> (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:

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

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

c. 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.

10.Academic Honesty and Integrity Policy: Academic honesty and integrity are to be maintained by all the students throughout the semester and no type of academic dishonesty is acceptable.

Instructorincharge
ECEF244 / EEE F244/ INSTR F244