BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, PILANI, HYDERABAD CAMPUS

SECOND SEMESTER 2021-22

COURSE HANDOUT (PART II)

Date: 15.01.2022

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, Karumbaiah Chappanda**
(ii) For Tutorial : **Syed Ershad Ahmed , Karumbaiah Chappanda 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	Chapter in the Text Book
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	3	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	3	Text Ch 5--5.5, 5.6, 5.7, 5.8, 5.9

5.	Differential amplifiers	Design of differential amplifiers	6	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	9	Text Ch.8.1-8.7
8.	Operational Amplifiers	Design and characterization of an integrated circuit OP-AMP	6	Text Ch. 9
9.	Stability & frequency compensation in OP AMP, Noise	Techniques for stability of opamp in feedback mode.	5	Text ch-8.8-8.11
10	Illustrative examples of integrated electronic systems—an overview	Building of electronic systems	2	To be announced
Total (42)				

6. Evaluation Scheme:

#	Component	Duration	Weightage	Full marks	Date & time	Remarks
1	Quizzes/Assignments	To be announced	25 %	50	To be announced later	Open Book
2	Midterm	90 min	35 %	70	15/03 11.00am to12.30pm	Closed Book
3	Comprehensive	120 min	40 %	80	17/05 AN	Closed Book

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 surgeon.

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.

mts : minutes
CB: Closed Book
OB: Open Book

Instructor-in-charge
ECEF244 / EEE F244/ INSTR F244