



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. : **EEE F 244 / INSTR F 244**

Course Title : **Microelectronic Circuits**

Instructor-in-charge : **ANU GUPTA**

Team of Instructor : Nitin Chaturvedi, Kavindra Kandpal, Mahesh Angira, Abhijit Asati, Babu Ravi Teja

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1. Scope of the Course:

The objective of this course is to develop an ability to analyze and design integrated electronic circuits. The course aims at thorough understanding of electronic circuits & building blocks necessary for effective realizations of integrated circuits. The course also includes the usage of SPICE as a circuit design aid.

2. Objectives of the Course:

- Understand device modelling, two port network models, amplifier characterization parameters
- Understand the necessity of and techniques to set DC bias, Quiescent point location for different types of amplifiers.
- Understand analysis and synthesis of different single/ multi stage amplifiers and their characterization.
- Practice EDA tools in design of amplifiers.

3. Text Book: Adel. S. Sedra, Kenneth C Smith, “Microelectronic Circuits”, Oxford University Press, Fifth Edition.

4. Prime Reference Book/s: Behzad Razavi, “Design of Analog CMOS Integrated Circuits”, TATA McGRAW Hill, 2001.

5. Other reference books :

- a. Richard. C. Jaeger, “Microelectronic Circuit Design”, Tata McGraw-Hill Companies Inc., International Edition.
- b. R.Jacob.Baker, Harry.W.Li, David.Boyce, “CMOS circuit Design Layout and simulation. ”IEEE Press series on Microelectronic Systems, PHI.





6. Course Plan :

S.No.	Topic	No. of Lectures	Ref. From the Text Book (Article)	Learning Objective
1.	Introduction to Amplifiers	2	Text chapter-1 1.4, 1.5,1.6	To learn: Characteristic of Amplifiers
2	Models of MOSFET, Overview-physics of MOSFET, BJT	2	Text ch-1, 4 Prime Ref - chapter 2	To learn: MOS/ BJT device physics
3.	Integrated circuit MOSFET Amplifier circuits, and Frequency response	3	Prime Ref —ch. 3, ch. 7, Text Ch 4--4.5, 4.6, 4.7, 4.8, 4.9, Ch. 6	To learn: IC MOSFET Amplifier design
4.	Integrated circuit BJT Amplifiers, frequency response and BJT models	3	Text Ch 5--5.5, 5.6, 5.7, 5.8, 5.9, Ch. 6	To learn: Discrete and IC BJT Amplifier Design
5.	Differential amplifiers	6	Prime Ref -Ch. 4 Text --Ch.7	To learn: Design of differential amplifiers
6.	Passive and active current mirrors.	4	Prime Ref Ch. 5 Text Ch.6	To learn: Design of IC bias circuits
7.	Feedback	9	Prime Ref ch-8 Text Ch.8	To learn: Concept of feedback, feedback amplifier-design, analysis
8.	Operational Amplifiers	6	Prime Ref ch-9 Text Ch. 9,	To learn: Design and characterization of an integrated circuit OP-AMP
9.	Stability & frequency compensation in OP AMP, Noise	6	Prime Ref ch.-10, 7 Text ch-8	To learn: Techniques for stability of opamp in feedback mode.
10	Illustrative example/s of integrated electronic systems—an overview	1		To learn: Building of electronic systems
		Total (42)		





7. **Evaluation Scheme:**

EC No.	Components	Duration	Marks (weightage)	Date & Time	Remarks
1	Mid semester test	90 mts.	75 (25 %)	7/3 2:00 -3:30 PM	CB
3	Regular Quiz (weekly Tutorial hour)	Regular	60 (20%)	Spread throughout the semester	OB
4	Assignments /online-test		45 (15%)	To be announced and conducted during the semester	OB
5	Comprehensive Exam	3 hrs.	120 (40%)	7/5 FN	CB/ OB
Total			(300) (100%)		

- 8. Online test/ Assignment/s :**SPICE based circuit design and analysis assignments , Practice of SPICE software
- 9. Chamber Consultation Hour:** to be announced in the class . May Contact IC to fix a time. Email--anug@pilani.bits-pilani.ac.in
- 10. Notices:** All notices related to the course will be put on the **EEE** Notice board/ NALANDA (online portal).

Instructor-in-charge

