

ELECTRONIC DEVICES AND AMPLIFIER CIRCUITS

Course Code	20EC3301	Year	II	Semester	I
Course Category	Program Core	Branch	ECE	Course Type	Theory
Credits	3	L-T-P	3-0-0	Prerequisites	BEEE
Continuous Internal Evaluation	30	Semester End Evaluation	70	Total Marks	100

Course Outcomes

Upon successful completion of the course, the student will be able to

CO1	Describe the basic concepts of BJT, MOSFET Circuits and IC design Philosophy. (L2)
CO2	Analyze the BJT and MOSFET Characteristics. (L4)
CO3	Analyze the Amplifiers using MOSFET (L4)
CO4	Apply the different biasing techniques of BJT, MOSFET and IC Design (L3)

Contribution of Course Outcomes towards achievement of Program Outcomes & Strength of correlations (3:High, 2: Medium, 1:Low)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2									1			2	
CO2		3								2			3	
CO3		3								2			3	
CO4	3									2			3	
Average* (Rounded to nearest integer)	3	3								2			3	

Syllabus

Unit No.	Contents	Mapped CO
I	Bipolar Junction Transistors: Device structure and physical operation, current-voltage characteristics, the BJT as an amplifier and as a switch, biasing in BJT amplifier circuits, small signal operation and models.	CO1,CO2, CO4
II	MOS Field-Effect Transistors: Device structure and physical operation, current-voltage characteristics, the MOSFET as an amplifier and as a switch, biasing in MOS amplifier circuits, small signal operation and models.	CO1,CO2, CO4
III	Single Stage MOSFET Amplifiers: Estimating 3dB frequency of amplifiers, Basic MOSFET amplifier configurations, MOSFET internal capacitances and high frequency model. Low Frequency and High Frequency Response Of MOSFET Amplifiers	CO1,CO3
IV	Differential Amplifiers: The MOS differential pair, small-signal operation of the MOS differential pair, other non-ideal characteristics of MOS differential amplifier, the	CO1,CO3

	MOS differential amplifier with active load, multistage MOS amplifiers.	
V	IC Design Philosophy: Comparison of the MOSFET and the BJT, IC biasing-current sources, current mirrors and current-steering circuits.	CO1,CO4

Learning Resources

Text Books

1. Adel S. Sedra, Kenneth C. Smith, Arun N. Chandorkar, Microelectronic Circuits, 6/e, Oxford University Press, 2013.

Reference Books

1. Behzad Razavi, Fundamentals of Microelectronics, 2/e, Wiley Student Edition, 2013.
2. R. L. Boylestad, Louis Nashelsky, Electronic Devices and Circuits Theory, 10/e, Pearson, 2009
3. Dharma Raj Cheruku, B T Krishna, Electronic Devices and Circuits, 2/e, Pearson, 2008

e- Resources & other digital material

1. <http://www.faadooengineers.com/threads/4615-Electronic-Devices-and-Circuit-Theory-Boylestad-and-Nashelsky>
2. <https://docplayer.net/53934331-J-b-gupta-electronic-devices-and-circuits.html>