

EC 251: Analog and Switching Circuits

CREDITS =6 (L=4,T=0,P=2)

1 Introduction: Review of Transistors' low and high frequency models, Field Effect Transistors, Construction and Characteristics of JFETs, Transfer Characteristics, Operation of JFETs, Depletion and Enhance type MOSFETs.
08

2. FET Biasing and Small Signal Analysis:

Common source, Common drain amplifier, Generalized FET amplifiers, Biasing FETs, FETs as voltage variable resistor, Small signal modeling, Effects of source resistors and load resistor on FET networks. Practical FET amplifiers and oscillator circuits, Frequency response of FETs.

10

3 Operational Amplifiers: Review of feedback amplifier configurations, characteristics of an ideal operational amplifier, difference amplifier, common mode rejection, offset voltage, virtual ground, floating output, darlington amplifier, cascade amplifier, slew rate and gain-bandwidth product, frequency response of an op-amp, inverting, non- inverting configurations, adders, subtractors, comparators, wave shaping circuits and oscillators.

10

4 Switching Circuits: Switching actions of diodes, transistors and MOSFETs. Transistors and MOSFETs in switch configurations, Effect of inductive and capacitive loads. Various multivibrator configurations transistors and op-amp based, Schmitt triggers and sweep generators with applications.

12

REFERENCE BOOKS

Title: Electronic Devices and Circuit Theory

Author: Robert L. Boylestad and Louis Nashelsky

Publisher: Prentice Hall of India, New Delhi, India

Title: Electronics Principles

Author: Albert Malvino and David J. Bates

Publisher: Tata McGraw Hill Publishing Company, New Delhi, India

Title: Electronics Devices and Circuits

Author: Jacob Milman, Christos C. Halkias and Satyabrata Jit

Publisher:

Title:

Author:

Publisher:

Tata McGraw Hill Publishing Company, New Delhi, India

Pulse, Digital and Switching Waveforms

Jacob Millman, Herbert Taub and M.S.P.Rao

Tata Mc Graw Hill Publishing Company, New Delhi