

Devi Ahilya University, Indore, India Institute of Engineering & Technology				BE-I Year (Common to all branches) (Part-Time)			
Subject Code & Name	Instructions Hours per Week			Credits			
ETP1C4: Basic Electronics	L	T	P	L	T	P	Total
Duration of Theory Paper: 3 Hours	2	1	1	2	1	1	4

Course Objectives: To introduce the basic concepts of electronics along with the understanding of working fundamental circuit devices such as diode, transistors and opamp.

Prerequisite(s): nil

COURSE OF CONTENTS

UNIT I

Discrete electronic devices: Diode, zener diode, BJT (Bipolar junction transistor), LED, photodiode phototransistor, varactor; characteristic and operation (qualitative description and quantitative behavior with black box approach)

UNIT II

Diode circuits; clipper, clamper circuits, DC power supply: rectifier-half wave, full wave (center tapped, bridge), zener regulated power supply, regulation (with regulator IC-LM317)

UNIT III

BJT characteristics; BJT biasing; CE-biasing circuits: operating point; h-parameter model of transistor; large/small signal models (concept); large/small signal models of CE-BJT amplifier, Design of amplifier; Differential amplifier (using BJT).

UNIT IV

Operational amplifier: basic model; virtual ground concept; inverting amplifier; non-inverting amplifier; integrator; differentiator; Schmitt trigger; astable multivibrator, Simple active filters: low pass, high pass, bandpass, notch filter

UNIT V

Basic feedback theory; +ve and -ve feedback; concept of stability; oscillator, Waveform generator using op-amp schmitt trigger for Square wave, triangular wave Wien bridge oscillator for sinusoidal waveform

BOOKS RECOMMENDED:

- [1] Ralph J. Smith, R.C. Dorf circuits, devices and systems, John Wiley, 1992.
- [2] R.L. Boylestad, L. Nashelsky, Electronic devices, and circuit theory, Prentice Hall, 2002.
- [3] A. S. Sedra, K.C. Smith, Microelectronic circuits, Oxford University Press, 1998
- [4] R.A. Gayakwad, OP-amps and linear integrated circuits, Prentice Hall of India.
- [5] Millman, Grabel, Microelectronics, Mc-Graw-Hill.
- [6] De Carlo, and Lin, Linear circuit analysis, Oxford University Press, 2001 (second edition).
- [7] Hayt, Kammerly and Durbin, Engineering Circuit Analysis, Tata McGraw Hill, sixth edition.