Devi Ahilya University, Indore, India Institute of Engineering & Technology				BE-I Year (Common to all branches) Semester- 1			
Subject Code & Name	**Instructions Hours per Week**			**Credits**			
ETR1C4:	**L**	**T**	**P**	**L**	**T**	**P**	**Total**
Basic Electronics	**3**	**1**	**2**	**3**	**1**	**1**	**5**
Duration of Theory Paper: 3 Hours							

Learning Objectives:

- To introduce the basic concepts of electronics along with the understanding of working fundamental circuit devises such as diode, transistors and op-amp.To apply the basics of diode to describe the working of rectifier circuits such as Full and half wave rectifiers and zener diode as a voltage regulator in line and load regulation.
- Describe the application of transistors for Current and voltage amplification, the characteristics of different configurations of the transistor, DC load line and bias point. List, explain, and design and analyse the different biasing circuits, to give basic knowledge of working of op-amp, its characteristics and applications.

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 behaviour 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; astablemultivibrator, 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 schimitt trigger for Square wave, triangular wave Wien bridge oscillator for sinuisoidal waveform

Learning outcomes:

- Students will be able to get the knowledge of Q point and can calculate it using different biasing circuits. They will easily compare different biasing circuits on the basis of stability factor.
- Students will be able to solve clipper and clamper circuits. They get the knowledge og op-amp and its various applications as integrator, differentiator and as an oscillator.

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, Microelectrinic circuits, Oxfort 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 Univesity Press, 2001 (second edition).
[7] Hayt, Kammerly and Durbin, Engineering Circuit Analysis, Tata McGraw Hill, sixth edition.