ELECTRONICS ENGINEERING
(Engineering Science Elective)

Course Code: 15EC1145

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Course Outcomes:

At the end of the course the student will be able to

CO 1 Classify different materials used for an electronic device & describe the characteristic of diode and Design power supplies using Rectifiers and Filters.

CO 2 Comprehend bipolar junction transistor characteristics for various configurations.

CO 3 Elucidate the concepts of feedback amplifiers and oscillators.

CO 4 Acquire knowledge on the basic digital electronic component

CO 5 Analyze different types of ADC & DAC.

UNIT –I **(10 Lectures)**

SEMICONDUCTOR DIODE:

Classification of materials, energy levels, intrinsic and extrinsic semiconductor, conduction in metals and semiconductors. Characteristics of PN junction diode, Applications of Diode- Switch, rectifier with and without filters.

UNIT –II **(10 Lectures)**

BIPOLAR JUNCTION TRANSISTOR:

Bipolar Junction Transistor structure , Principle of operation, Transistor (BJT) configurations CB, CE, CC, Relation between a, â, ã. Input and output characteristics of BJT, transistor as a switch, transistor as an amplifier.

UNIT –III **(10Lectures)**

FEEDBACK AMPLIFIERS:

Concept of feedback, advantages & disadvantages of negative

feedback amplifier, feedback amplifier topologies, effect of negative feedback on input and output resistances.

OSCILLATORS:

Classification of oscillators, Barkhausen's criterion, RC phase shift oscillator, Hartley and Colpitt's oscillators.

UNIT –IV (10 Lectures)

NUMBER SYSTEMS & BOOLEAN ALGEBRA:

Binary number systems and codes complement representation of negative numbers, Basic Logic Gates and Truth Tables, Boolean algebra, De Morgan's Theorems, Logic Circuits, Encoder, Decoder, Multiplexer, Demultiplexer.

UNIT –V (10 Lectures)

A/D AND D/ACONVERTERS:

Basic Principle of Analog–to-Digital (ADC) and Digital-to-Analog (DAC) Conversion, Successive Approximation type, Dual slope ADCs, Weighted Resistor and R-2R Ladder Type DAC.

TEXT BOOKS:

1. J.Millman and C.C.Halkias, *"Electronics Devices and Circuits"*, TMH 1998. (Units 1, 2 & 3).
2. Morris Mano, *"Digital Design"*, 3rd Edition, PHI, 2006. (Unit 4).
3. D. Roy Chowdhury, "Linear Integrated Circuits", 2nd Edition, New Age International (p) Ltd, 2003. (Unit 5).

REFERENCES:

1. B.Visweswara Rao, K.Bhaskara Murthy, K.RajaRajeswari, P.Chalam Raju Pantulu. *"Electronic Devices and Circuits"*, Pearson Publications, 2nd Edition, 2009.
2. Raju GSN, *"Electronic Devices and Circuits"*, 1st Edition, IK International Publishing House, 2006.
3. Lal Kishore, *"Electronic Devices & Circuits Vol. I"*, 2nd Edition, BSP Publications, 2005.