1/4 B.Tech - SECOND SEMESTER

BASIC ELECTRONICS ENGINEERING

(Common to CSE, IT during I B.Tech., II Semester)

Course Code(s): CS2T5, IT2T5 **Credits: 3**
Lecture: 3 Periods/week **Internal assessment: 30 marks**
Practice/Interaction: 1 Period /week **Semester end examination: 70 marks**

Objectives:

- To study in detail about construction of several electronic devices.
- To analyse the characteristics of various electronic devices and circuits.
- To understand the internal structure and characteristics of Op-amp.
- To learn about the linear and non-linear applications of Op-amp.

Outcomes:

Students will be able to

- Understand the semiconductor physics of the intrinsic, p and n materials.
- Understand the function and operation of diodes, transistors and amplifiers.
- Students will be aware of the architecture, functions & their applications of IC 741 OP-Amp

Syllabus:

UNIT – I

Semi Conductors and Diodes: Conductors, Semiconductors, Intrinsic Semiconductors, Extrinsic Semi Conductors. Diode Theory: Basic Ideas, The ideal Diode, Forward and Reverse Bias, Diode Equation, Volt-Ampere Characteristic. Special diodes: symbol of zener diode, operation, V-I characteristics, symbol of photo diode, working principle, LED symbol and principle.

UNIT – II

Rectifiers: Half-wave Rectifier, Full-wave and Bridge Rectifier, derivation of Ripple factor, efficiency of Half-wave, full-wave and Bridge rectifiers. Merits and demerits of Half-wave, full-wave and Bridge rectifiers, Comparisons of rectifiers.

UNIT- III

Bipolar Junction Transistors: Symbols of pnp and npn transistors and their working principles, Transistor currents, input and output characteristics of Common base configuration, Common Emitter configuration Transistor Switch, Amplifiers: working principles of Common base amplifier, Common Emitter amplifier, Common collector amplifier and their applications

UNIT- IV

Characteristics of Op-Amps: Introduction to OP-amp, Op-amp Block Diagram, ideal and practical Op-amp specifications, 741 op-amp & its features, Op-Amp parameters & Measurement, Input & Out put off set voltages & currents, slew rates, CMRR, PSRR.

UNIT-V

Applications of Op-Amps: Inverting and Non-inverting amplifier, Integrator and differentiator, Comparators.

Text Books:

1. Electronic Principles, Albert Malvino and David J Bates, 7th Edition, Tata McGraw –Hill.
2. Electronic Devices and Circuits Theory, Boyelstad, Pearson Education, 8th Edition, September 2011.
3. Op-Amps and Linear Integrated Circuits , - Ramakanth A. Gayakwad, PHI, 4th Edition, 2009
4. Linear Integrated Circuits – D. Roy Chowdhury, New Age International Pvt.Ltd., 2nd Edition, 2003.

Reference Books:

1. Electronic Devices and Circuit Theory, Robert L.Boylestad and Louis Nashelsky, 10th Edition(2010), Pearson/PHI
2. Electronic Devices and Circuits, David A.Bell, Oxford, 5th edition, 2009.
3. Electronic Devices and Circuits, S.Salivahanan, Kumar, Vallavaraj, TATA McGraw Hill, 2nd Edition, 2003.
4. Operational Amplifiers & Linear ICs, David A Bell, Oxford Uni. Press, 3rd Edition, 2005.

e-Learning Resource:

1. http://nptel.ac.in/courses.php http://jntuk-coeerd.in/