

B.Sc. Electronics First Semester

Fundamentals of Electronics
Teaching Hours/Week (L-T-P): 3 - 0 - 0
Internal Assessment: 40 Marks

Course Code: OEC1
No. of Credits: 03
Semester End Examination: 60 Marks

Module 1: Theory of semiconductors

09 Hours

Review of semiconductors - energy band theory of crystals Intrinsic semiconductors- Atomic structure of Germanium and Silicon. Current Conduction and drift current in intrinsic semiconductors, Extrinsic semiconductor – P-type and N-type, conduction in both types of semiconductors. Semiconductor diode : - formation of P-N junction & depletion layer. Symbol Working of P-N junction diode, I-V Characteristics in forward & reverse Bias.

Module 2: Circuit fundamentals

09 Hours

Review of passive components: - Resistors(R), Inductors(L) and Capacitors(C) features, types, colour coding of resistors. Capacitors charging & discharging. Growth and decay of current in inductor through resistor. Energy stored in capacitor & inductor. Transformer: - Construction & working, transformer turn ratio, losses & types of transformers. Energy sources - concept of voltage and current source, Characteristics.

Module 3: A.C circuits

08 Hours

Fundamentals of AC circuits: - Characteristics of sine wave, Basic definitions of sine wave- Amplitude, period, frequency, average & rms value. CRO& DMM: - Functions of cathode ray oscilloscope and digital multi meter and Measurements of various parameters using CRO & DMM.

Module 4: Demonstration of basic components

08 Hours

Demonstration of basic components like resistors, capacitors and inductors. Identification of resistors values by colour coding. Verification of Ohm's Law and power relation in electrical networks. Series and parallel combination of resistors with voltage dividing and current dividing concept. Series and parallel combination of capacitors with practical approach.

Module 5: Demonstration of PN junction diode and Soldering

08 Hours

PN junction diode: Demonstration of pn- junction diode forward and reverse bias I V - characteristics. Soldering: - principles of solder connection, solder joints, solder alloys, soldering fluxes, soldering tools, soldering and de-soldering tools and techniques, man soldering, solder mask, Safety precautions health and medical aspects in soldering practice.

Text Books/Reference Books:

1. Solid state electronics-by B.L. Theraja
2. Principles of electrons – by V.K. Mehta
3. Fundamentals of electrical & electronic engineering, B L Theraja
4. Electronic devices & circuits, Jacob Millman & Halkias,
5. Electronic device & circuits theory Robert Boylested & Louis Nashelsky-
6. Basic electronics, B.Grob, 8th Edition
7. Electrical circuits & application, B.Grob

Course Outcomes (CO): After completion of this course student should able to

CO	Statement
1	Describe the basic concepts of electronic principles.
2	Identify the electronic components.
3	Make the soldering and the breadboard connections.
4	Make connections according to the circuits given to them.
