



Paper Code : BEL:105
Paper Name : Basic Electronics

Teaching Hours (Per Week)		Examination Scheme		
TH. (hours)	Pr. (hours)	Internal Th. (marks)	External Th. (marks)	Total
4		30	70	100 (marks)

Lectures = 68 Hours

Objective of Basic Electronics:

This course has been designed to provide an introduction to the basic electronic components that go into making of electronics devices. The course covers the various tools available for diagnosing an electronic circuits and component testing through which a student can repair damages of their own. **Detailed Syllabus**

UNIT 1 : COMPONENTS 14 Hours

Introduction to Components– Passive and active components – Resistors, standardisation, colour coding techniques, types of resistors –Capacitors, types of capacitors – Inductors, types of inductors, features and specification, transformers, types of transformer.

Diodes- Atomic theory – Structure of Silicon and Germanium – Energy band diagram of conductors, semiconductor, insulator – Intrinsic & extrinsic semiconductor – PN junction diode – Characteristics of forward & reverse bias PN junction.

UNIT 2 : SPECIAL DIODES & THEIR APPLICATIONS 8 Hours

Special Diodes – Zener diode – Light Emitting Diode (LED) – Light Dependent Diode (LDR).

Rectifier – Half wave and Full wave (Bridge & Centre-Tapped) rectifier – Ripple Factor – Efficiency and filter circuits of rectifiers.

UNIT 3 : TRANSISTORS & BIASING METHODS 17 Hours

Bipolar Junction Transistor – Transistor construction – PNP and NPN transistor – Modes of operation – Common base configuration (CB), Common emitter configuration (CE), Common collector configuration (CC) – Transistor parameters – Relationship between α and β – Biasing Methods – Fixed Bias – Collector-Base Bias – Emitter Bias

Field Effect Transistors – Classification of FET – Comparative study of BJT and JFET – Merits and demerits of FET – Construction of JFET – JFET Characteristics – MOSFET (Enhancement & Depletion)

**UNIT 4 : POWER AMPLIFIERS & OP-AMP****17 Hours**

Amplifiers – Introduction – Classification of power amplifiers – Class A,B,AB,C – Single stage amplifier – R-C coupled amplifier – Transformer coupled class A amplifier – Pull-pull amplifier.

Feedback Amplifier – **Positive** and Negative feedback amplifiers (Qualitative Study only) – Applications of Op-Amp.

UNIT 5 : OSCILLATORS**12 Hours**

Definition – Conditions for oscillation – Classification of oscillators – RC phase shift – Wien bridge – Colpitts oscillators – Hartley – Crystal oscillators – Difference between rectifiers, amplifiers and oscillators.

RECOMMENDED BOOKS**Main Reading:**

1. Basic Electronics, Grobe.
2. Electronics Devices and Circuits, G.S.N Raju
3. Electronic Devices and Circuits, Jacob Millman & Christos C.Halkias,

Supplementary Books

1. Electronic Devices and Circuits, S. Salivahanan, N. Suresh Kumar and A. Vallavaraj,
2. Electronics Devices and Components, A. Jamila Rani. N.V. Publications
3. Physics of Semiconductor Devices, S.M Sze, Kwok Kwok Ng
4. Basic Electrical and Electronics, R.K Rajput
5. Electronics (Fundamental & Applications), D. Chattopadhyay
6. Microelectronic Circuits, Adel S. Sedra, Kenneth Carless Smith
7. Electronic Circuit Analysis, B. Visvesvara Rao, B. Visvesvara Rao, K. Raja Rajeswari, P.Chalam Raju Pantulu, K.Bhaskara Rama Murty