

Electronics Engineering Department, SVNIT, Surat

| Year | Subject | Code | Scheme L-T-P | Core/ Elective |
|------------|----------------------------------|----------|-----------------|-------------------|
| B. Tech- I | Basic of Electronics Engineering | EC107DEF | 3 – 0 – 2 | Core |

Course Assessment Method:

| Attendance | Internal Teacher's Assessment | Mid Semester Examination | End Semester Examination | Tutorial | Practical | Total |
|------------|-------------------------------------|--------------------------------|--------------------------------|----------|-----------|-------|
| 10 | 10 | 30 | 50 | ----- | 50 | 150 |

Course Outcome:

After studying this course, students will be able to analyze the various electronic Components like Various DIODES, LED, LCD, LASER, BJT, FET, MOSFET, OP-AMP, AND ELECTRONIC INSTRUMENTS , POWER SUPPLIES etc. Students acquire enough knowledge during this subject study and they can add capacity to solve some preliminary designs of above components utilized in various electronic applications.

This course is must to start electronics study for in depth understanding. Without this subject study electronics basic principles cannot get cleared and candidate may face lot of confusion during further study.

This subject is main fulcrum of all other electronics subjects.

Topics Covered with Contact hours and Reference Books:**B.Tech. I (All Branch)****L T P C****ECE107 :Basic of Electronics Engineering****3 0 2 4****PN DIODE AND DC POWER SUPPLY****(06 Hours)**

PN diode Theory, Construction, Operation with Forward and Reverse VI Characteristics, PN Junction in Breakdown Region, PN diode approximate, Simplified and Ideal model, PN diode Application as Rectifier, Half Wave Rectifier, Center Tap and Bridge Rectifier, Advantage & Disadvantage of Rectifier, Filter circuits, C, LC and Pie filters with circuit Diagram and waveforms, Zener Diode theory, Construction, Operation with forward and reverse V-I characteristics, Zener Voltage Regulator, Diode as clamper and clipper, Switched mode power supply(SMPS)

GENERAL DIODES THEORY AND APPLICATIONS**(06 Hours)**

Photodiode theory, V-I characteristics and application, LED Theory, 7 segment LED circuit diagram and Multi colour LED, LED applications, LCD Theory and application, Varactor Diode Theory and application, Shockley Diode Theory and characteristics, PIN diode theory and characteristics, LASER diode theory and applications.

BJT CONFIGURATION AND APPLICATIONS**(07 Hours)**

Bipolar Junction Theory, Naming The Transistor Terminals, Transistor Action, Transistor Symbols, Common Collector, Common Emitter And Common Base Configurations, Different Biasing Techniques, Concept of Transistor Amplifier.

FET AND MOSFET THEORY**(07 Hours)**

Field Effect Transistor Construction Theory, Types of Field Effect Transistors Principle and Working of JFET, Schematic Symbol of JFET, Output Characteristics of JFET, Feature of JFET, Advantage of JFET, MOSFET Construction Theory, Types of MOSFET, Symbol of D-MOSFET and E-MOSFET, Depletion Mode MOSFET and Enhancement Mode of MOSFET, Transfer Characteristics.

OPERATIONAL AMPLIFIER AND APPLICATIONS (07 Hours)

Introduction to OP-AMP with block diagram, Schematic Symbol of OP-AMP, The 741 package style and pinouts, Inverting amplifier, Non-inverting amplifier, Voltage Follower circuit, Multistage OP-AMP circuit, OP-AMP averaging amplifier, OP-AMP subtractor

DIFFERENT INSTRUMENTS (09 Hours)

Role and Important of General purpose test instrument, Cathode-RAY Oscilloscope(CRO), and Digital storage Oscilloscope (DSO), Theory and applications, Function Generator, Different Power supply, Digital Multi-meter (DMM).

(Total Contact Time:42 Hours)

PRACTICALS

- 01) Study of Electronics Instruments CRO, Function Generator, DSO, PS, and Digital Multi-Meter.
- 02) Introduction to the Simulation software "MULTISIM-09".
- 03) Study of Electronics Device and Accessories.
- 04) PN Semiconductor diode forward and reverse characteristics.
- 05) Zener diode characteristics.
- 06) Performance study of Half-wave rectifier & full-wave rectifier.
- 07) Performance study of Different Filters circuits.
- 08) Frequency Measurement and Phase difference Measurement using C.R.O.
- 09) Diode application as clamper.
- 10) Characteristics of Photo-Diode.
- 11) Study of Transistor characteristics.
- 12) Study of FET characteristics.
- 13) Study of 741 OP-AMP.
- 14) MINI-PROJECT.

BOOKS RECOMMENDED

1. Malvin Albert & David J. Bates, "Electronic Principles" Tata McGraw Hill, 7th edition, 2007.
2. Boylestad Robert L. & Nashlesky Louis, "Electronic Devices & Circuit Theory", PHI Publication, 8th edition, 2007.
3. Mehta V. K. & Mehta Rohit, "Principles of Electronics" S. Chand & Co. Ltd., 11th Revised Ed. 2008.
4. Thomas L. Floyd, "Electronics Devices", Pearson Education, 7th Ed., 2005
5. Cheruku D. R. and Battula T. K., "Electronics Devices & Circuits", Pearson Education, 2nd Ed. 2008.
6. De Debashis, "Basic of Electronics", Pearson Education, 1st Ed., 2008.