

**Gujarat University  
Ahmedabad**

**B. Sc. Semester - I**

**Electronics : ELE - 101**

**Unit - I: Components and Instrumentation:**

Passive Circuit devices: Resistors, nonlinear resistors, inductors, types of inductors, capacitors, classification of capacitors, different type of capacitors. Switch, types of switches, fuses, circuit breaker, relay, PCB.

Text Book: 1. A text book of electronic circuits R. S. Sedha, S. Chand  
Chapter No: 13 (13.1 to 13.48) chapter No: 14 (14.1 to 14.14)

Measuring instruments: DC ammeters, DC voltmeters, Voltmeter sensitivity, series type ohmmeter, shunt type ohmmeter, multimeter, Rectifier type instruments( AC voltmeter) Typical multimeter circuit.

Text Book: Modern Electronics instrumentation and measurement techniques, Helfric and Cooper, PHI 11<sup>th</sup> Reprint (Art. 4.4 to 4.9, 4.11.2, 4.11.3)

Ref Books: 1. A monograph on Electronics design principle Goyal and Khetan Khanna Publisher  
2. Electronics (Solid State) by B. L. Theraja S. Chand & Co.  
3. Basic Electronics by Grob  
4. Electronic Instrumentation by H. S. Kalsi TMH India

**Unit - II: Diodes and their Applications:**

Diode Application: Load line analysis of a diode circuit, clipping circuit, positive and negative clipper, biased clipper clipper, some other biased clipper, combination clipper, two level slicer, clamping circuit, biased clampers, practical clamper circuits, application of clamping circuits, voltage multiplier, voltage doublers, voltage tripler and quadrupler.

Special purpose diodes: varactor diode, varactor diode specifications and applications, LED, LED voltage drop and current, LED applications, multicolour LEDs, LCDs, photodiodes, photoconductive cells, photo voltaic cells, LASER diodes and applications.

Text Books: Electronic Devices and Circuits by Allen Mottershead (2.1)  
A text book of electronic circuits R. S. Sedha, S. Chand  
6.1 to 6.14, 7.12 to 7.14, 7.21 to 7.24, 7.27 to 7.31, 7.33 to 7.35.-7.25

Reference Book: Electronic Devices and Circuit Boylestead and Namensky  
Electronic Principles by Malvino and Bates

**Unit-III: General amplifier characteristics:**

Concept of amplification, amplifier notation, current, voltage and power gain, amplifier input resistance and output resistance, maximum power transfer, conversion efficiency, classes of amplifier, harmonic distortion, three point method of calculating distortion, Measurement of harmonic distortion, other type of amplifier distortion

Decibels, other equation for decibel computation, zero decibel reference level, use of a voltmeter as a decibel indicator, voltmeter range correction factor, frequency response, amplifier band width, phase relationship in amplifier, square wave testing

Text Book: Electronics devices and circuit – Allen Mottershead, PHI  
Article Nos: 7.1 to 7.12, 7.15, 7.16. 8.1 to 8.8 and 8.11

#### **Unit-IV: Digital Electronics:**

Binary number system, binary to decimal conversion, decimal to binary conversion, octal numbers, hexadecimal numbers, the ASCII codes, the excess-3 codes, the gray code, binary addition, binary subtraction, unsigned binary numbers, sign magnitude numbers, 2's complement representation, 2's complement arithmetic. Boolean laws and theorems.

Text Book: Digital Principles and applications 6<sup>th</sup> Edition Malvino Leach and Saha  
Article Nos: 5.1 to 5.8., 6.1 to 6.6., 3.1  
Reference Books: Digital Fundamentals by Floyd , Pearson  
Digital Design Morris and Mano, PHI

**GUJARAT UNIVERSITY**  
**Syllabus for First Year B. Sc.: Semester - I**

**ELECTRONICS Practicals : ELE - 102**

**PRACTICALS:**

**Group - I**

1. Measuring and testing of electronic passive components
2. Study and testing of electronic active component
3. To familiarise with various laboratory instruments
4. Conversion of Galvanometer into multirange DC and AC Voltmeter
5. Dielectric constant
6. Voltage doubler
7. Voltage Multiplier

**Group-II**

1. Half wave rectifier with and without C filter (Load regulation and ripple)
2. Full wave rectifier with and without C filter (Load regulation and ripple)
3. To study Zener diode as a shunt regulator.
4. Characteristic of different coloured LED
5. To find resonance frequency and Q of a given series resonant circuit by varying frequency of ac source.
6. Wein bridge
7. CE Amplifier (Load Variation)