

# *Syllabus for B.Sc-IT Course*

## *at S.P. College*

### SEMESTER-II

COURSE TITLE: DIGITAL ELECTRONICS

COURSE CODE: BIT- 201

#### UNIT-I

##### Number System, Gates and Logic Families

Binary Number System – Addition, Subtraction, Multiplication and Division of Binary Numbers; Digital signals , Basic Logic Operations – NOT, OR , AND, NOR, NAND, XOR, XNOR Gates; Universality of NAND and NOR gates; Positive and Negative Logic.

##### Semiconductors

Semiconductors , PN Junction diode , Zener Diode , Schotky Diode , Bipolar Junction Transistor , Schotky Transistor , Field Effect Transistor , resistance Transistor Logic (RTL) , Diode Transistor Logic (DTL) , Transistor Transistor Logic (TTL) , Emmitter Coupled Logic (ECL) , HTL , MOS , CMOS.

#### UNIT-II

##### Combinational Logic

Introduction to Boolean Algebra - (Minterm, Maxterm, Representation of Boolean Expressions in SOP and POS form, Conversion of SOP to POS and vice-versa); Maximization of Boolean Expressions (Karnaugh map method and Quine-McClusky Method, Don't Care Conditions); Binary Codes (Excess 3, BCD, GRAY code, ASCII code, Various other weighted and un-weighted codes), Design of Arithmetic and Logic Circuits (Adder, Subtractor, Code Converters, Parity checker/Generator, Encoder /Multiplexer and Decoder/Demultiplexer).

#### UNIT-III

##### Flip Flops , Sequential Logic Design and Timing Circuits

Basic Memory Cell, Flip Flop Design (SR, JK, D,T); Clocked Flip Flop Triggering (edge and Level Triggering); Master Slave Flip Flop.

Introduction to Sequential Logic Design , Registers , Application of Shift Registers , Ripple Or Asynchronous Counters , Synchronous Counters , Timing Circuits -- Introduction , Application of Logic Gates in Timing circuits – Free running Multivibrator , Mono Stable Multivibrator.

#### UNIT-IV

##### Semiconductor Memories

Memory Organisation and Operation; Classification and Characterization of Memory; Sequential Memory (Dynamic Shift Registers, Dynamic MOS Registers, CMOS Shift Registers); ROM (Organization, Maskable programmable ROM, PROM, EPROM, FAMOS-PROM, MOAS-PROM), Read and Write Memory (Bipolar RAM Cell, MOS RAMs).

##### Recommended Books:

1. Modern Digital Electronics by R.P. Jain, Tata McGraw Hill.
2. Digital Fundamentals by Thomas Floyd, Prentice Hall.
3. Digital Logic and Computer Design by Morris Mano, PHI Pvt. Ltd.

##### Suggested Reading

4. Digital Systems- Principles and Application by R.J. Tocci, PHI Pvt. Ltd.
5. Introduction to Digital Techniques by Dan I, Port and Arpad Barne, John Wiley and Sons.
6. Digital Electronics from Gates to Microprocessors by S.K.Bose, Wiley Eastern Company Ltd.