

DIGITAL ELECTRONICS**B Tech II Year I Sem**

| Course Code | Category | Hours/Week | | | Credits | Maximum Marks | | |
|---------------------|-----------------------|-----------------------|---|---|------------------|---------------|-----|-------|
| | | L | T | P | | CIE | SEE | TOTAL |
| 23EC301 | Engineering sciences | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| | | | | | | | | |
| Contact Classes: 48 | Tutorial Classes: Nil | Practical Classes: 30 | | | Total Classes:48 | | | |

Course Objectives: This course aims at through understanding of binary number system, logic gates, combination logic and synchronous and asynchronous logic.

UNIT-I:

BOOLEAN ALGEBRA AND LOGIC GATES: Digital Systems, Binary Numbers, Number base conversions, Octal and Hexadecimal Numbers, complements, Signed binary numbers, Binary codes, Binary Storage and Registers, Binary logic. Basic Definitions, Axiomatic definition of Boolean Algebra, Basic theorems and properties of Boolean algebra, Boolean functions, canonical and standard forms, other logic operations, Digital logic gates.

UNIT-II:

GATE -LEVEL MINIMIZATION: The map method, Four-variable map, Five-Variable map, product of sums simplification Don't-care conditions, NAND and NOR implementation other Two-level implementations, Exclusive – Or function.

UNIT-III:

COMBINATIONAL LOGIC: Combinational Circuits, Analysis procedure Design procedure, Binary Adder-Subtract or Decimal Adder, Binary multiplier, magnitude comparator, Decoders, Encoders, Multiplexers, HDL for combinational circuits.

UNIT-IV:

SEQUENTIAL LOGIC: Sequential circuits, latches, Flip-Flops Analysis of clocked sequential circuits, state Reduction and Assignment, Design Procedure. Registers, shift Registers, Ripple counters, synchronous counters, other counters.

UNIT-V

MEMORIES AND ASYNCHRONOUS SEQUENTIAL LOGIC: Introduction, Random-Access Memory, Memory Decoding, Error Detection and correction Read-only memory, Programmable logic Array programmable Array logic, Sequential Programmable Devices.

Introduction, Analysis Procedure, Circuits with Latches, Design Procedure, Reduction of state and Flow Tables, Race-Free state Assignment Hazards, Design Example.

TEXTBOOKS:

1. Digital Design– Third Edition, M. Morris Mano, Pearson Education/PHI.
2. Digital Principles and Applications Albert Paul Malvino Donald P. Leach TATA McGraw Hill Edition.
3. Fundamentals of Logic Design, Roth,5thEdition, Thomson.

REFERENCEBOOKS:

1. Switching and Finite Automata Theory by Zvi .Kohavi, Tata McGraw Hill.
2. Switching and Logic Design, C.V. S. Rao ,Pearson Education
3. Digital Principles and Design–Donald D.Givone, Tata McGraw Hill, Edition.
4. Fundamentals of Digital Logic and Micro computer Design, 5TH Edition, M.Rafiquzzaman John Wiley.



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