

**NIRMA UNIVERSITY**  
**Integrated B. Tech. (CSE)-MBA programme**  
**Term - III**

L	T	P	C
3	0	2	4

<b>Course Code</b>	CSI0303
<b>Course Title</b>	Digital Electronics

**Course Outcomes:**

At the end of the course, students will be able to -

1. describe the basic building blocks of various digital circuits
2. design combinational logic and sequential logic circuits using basic components
3. identify digital components in computer organization
4. analyze digital circuits and its applications

**Syllabus:**

**Teaching hours:30**

**Unit I**

**4**

**Overview of Binary Systems and Logic Gates:** Introduction, Binary numbers, conversions, Octal, Hexadecimal Numbers, Complements, Binary Codes, binary storage, registers, Binary Logic  
 Boolean Algebra and Logic Gates, Boolean algebra, theorems and properties, Boolean functions simplification, canonical and standard forms, other logic operations, Digital logic gates, IC logic families.

**Unit II**

**5**

**Boolean Function Simplification:** The K-Map method, SOP/POS Simplification with don't care conditions using basic and universal gates, Tabulation method

**Unit III**

**6**

**Combinational Logic:** Introduction, analysis and design of various combinational circuits such as Adders, Subtractors, Code Convertors, Comparators, Binary Parallel Adder, Decimal Adder, magnitude comparators, ROMS, decoders, multiplexers, PLA.

**Unit IV**

**10**

**Sequential Logic:** Introduction, flip-flops, triggering of flip-flop, analysis and design of clocked sequential circuits, design with state equations, registers, shift registers, ripple counters, synchronous counters.

**Unit V**

**5**

**Digital Integrated Circuits:** Introduction, BJT characteristics, RTL and DTL logic. IIL and TTL Logic. ECL and MOS Logic CMOS Logic, ADC, DAC

**Self-Study:**

The self-study contents will be declared at the commencement of semester. Around 10% of the questions will be asked from self-study contents.

**Laboratory Work:**

Laboratory work will be based on above syllabus with minimum 8 experiments to be incorporated that will be considered for evaluation. Laboratory work will be based on Digital Trainer kits and simulators.

**Suggested Readings<sup>^</sup>:**

1. M. Morris Mano, Digital Logic and Computer Design, PHI
2. Malvino and Leach, Digital Principals and applications, McGraw-Hill
3. Virendra Kumar, Digital Technology Principals and Practices, New Age International
4. Holdsworth, Digital logic design, Elsevier Science

L=Lecture, T=Tutorial, P=Practical, C=Credit

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<sup>^</sup>this is not an exhaustive list