

Course Code	Course Title	L	T	P	C
1151BM103	Digital Electronics	3	0	0	3

a) Course Category

Program core

b) Preamble

To understand the basics of the Digital systems

c) Prerequisite

None

d) Related Courses

Microprocessor and Microcontroller.

e) Course Outcomes

Upon the successful completion of the course, students will be able to:

CO Nos.	Course outcomes	Knowledge Level (Based on Revised Bloom's Taxonomy)
CO1	Describe the basic digital logic circuits and number system.	K2
CO2	Explain the concept of circuit simplification using gates	K2
CO3	Explain the concept of flip flops.	K2
CO4	Explain the concept of counters	K2
CO5	Describe about the signal conversion from analog to digital	K2

f) Course content

UNIT I Number system & Boolean algebra **9**

Number system; Base conversion methods; compliments- 1's and 2's compliment; Codes- BCD- 2421- Excess 3- Gray and ASCII; Boolean Algebra: Basic theorems and properties- Boolean laws and De-Morgan's theorem; Canonical & Standard form; Introduction to logic gates; Boolean algebraic simplification and realizing using logic gates.

UNIT II Gate level minimization & Combinational logic **9**

Gate-level minimization: Introduction to Map Method- Three, four and five variable maps; Don't care conditions; Universal gate implementation; Exclusive OR function (parity check). Combinational Logic: Introduction; Arithmetic circuits; Comparators; Decoders and encoders; Multiplexers and De-multiplexers.

UNIT III Sequential Machine Fundamentals **9**

Fundamentals of sequential machine operation; Storage elements- Latches & Flip-flops (D-Flip-flop, T-Flip-flop, J-K flip-flop and Clocked flip-flops); ROM; RAM; Programmable logic array and programmable array logic

UNIT IV Sequential Circuit Design & Analysis **9**

Counters-Design of single mod counter- ripple counter- ring counters; Registers- Shift register sequences.State Diagram; Approaches to the design of synchronous sequential finite state machines (ASM); State reduction steps.

UNIT V Signal Conversion **9**

A/D and D/A converters: Weighted-resistor D/A converter; R-2R Ladder D/A converter; Parallel comparator A/D converter; Successive-approximation A/D converter.

Total 45 Hrs.

g) Learning Resources

Text Books

1. M. Morris Mano- Digital Design- pearson- fourth edition

Reference Books

1. Donald P Leach- Digital principles and applications-pearson- seventh edition