COURSE TITLE	**:**	**DIGITAL COMPUTER PRINCIPLES**
COURSE CODE	**:**	**3133**
COURSE CATEGORY	**:**	**B**
PERIODS/WEEK	**:**	**4**
PERIODS/SEMESTER	**:**	**60**
CREDITS	**:**	**4**

TIME SCHEDULE

MODULE	TOPICS	PERIODS
1	**Digital Systems & Logic Gates**	**15**
2	**Combinational Logic**	**15**
3	**Sequential Logic**	**15**
4	**A/D, D/A, Memory and Programmable Logic**	**15**

Course General Outcomes:

Sl.	G.O	On completion of this course the student will be able :
1	**1**	To understand Digital Systems and Data Representation
	2	To know Logic Gates and Boolean Algebra
2	**1**	To understand Gate Level Minimization
	2	To understand Combinational Logic
3	**1**	To understand Synchronous Sequential Logic
	2	To understand registers and Counters
4	1	To understand Analog to Digital and Digital to analog Convertor
	2	To understand Memory and Programmable Logic

Specific Outcomes:

MODULE –I Digital Systems & Logic Gates

1.1 To understand Digital Systems and Data Representation in Digital Computers

1.1.1 To state Digital Systems

1.1.2 To explain various Number Systems

1.1.3 To describe Binary Codes

1.2 To know Logic Gates and Boolean Algebra

1.2.1 To Describe Logic gates

1.2.2 To explain Boolean Algebra

1.2.3 To solve using Theorems and Properties of Boolean Algebra

MODULE – II Combinational Logic

2.1 To understand Gate Level Minimization

2.1.1 To Describe Map Method

2.1.2 To describe SOP and POS minimisation

2.1.3 To design and solve using Map method

2.2 To understand Combinational Logic

2.2.1 To explain different Combinational Circuits

MODULE – III Sequential Logic

3.1 To understand Synchronous Sequential Logic

3.1.1 To describe Sequential Circuits

3.1.2 To explain Storage elements – Latches & Flip-Flops

3.2 To understand registers and Counters

3.2.1 To explain different Registers

3.2.2 To explain Different counters

MODULE –IV A/D, D/A, Memory and Programmable Logic

4.1 To understand A/D and D/A converter

4.1.1 Discuss the different DAC specifications like resolution, accuracy, settling time monotonocity, line errors.

4.1.2 Study basic concept of DAC

4.1.3 Study basic concept of ADC.

4.2 To understand Memory and Programmable Logic

4.2.1 To describe Memory systems

4.2.2 To explain the decoding technique

4.2.3 To explain the different techniques in error detection and correction of data

4.2.4 To explain PAL and PLA

CONTENT DETAILS

MODULE –I Digital Systems & Logic Gat

Digital Systems – Binary numbers – Number base conversions- Octal, Hexadecimal - Complements of Numbers – Signed Binary Numbers - Binary Codes

Boolean Algebra – Introduction- Basic definitions – Axiomatic Definition of Boolean Algebra -Basic Theorems and Properties of Boolean Algebra – Boolean Functions- Canonical and standard forms –– Digital Logic Gates –

MODULE – II Combinational Logic

The Map Method – Four Variable K-Map – Product –of-Sums & Sum-of-Products Simplification – Don't Care Conditions – NAND and NOR Implementation – Two-level implementation –Exclusive –OR Function

Combinational Circuits – Binary Adder –Subtract or- Decimal Adder – Binary Multiplier – Magnitude Comparators-Decoder –Encoder-Multiplexer

MODULE – III Sequential Logic

Sequential Circuits – Storage elements – Latches & Flip-Flops

Registers – Shift register – Ripple Counters- Synchronous Counters-Ring counters - Johnson Counter

MODULE –IV A/D, D/A, Memory and Programmable Logic

DAC specifications like resolution, accuracy, settling time monotonocity, line errors. - DAC –-ADC

Random Access Memory -Memory decoding -Error detection and correction- Read Only Memory- Programmable Logic Array- Programmable Array Logic

Text Book(s):

1. Digital Design, M. Morris Mano & Michael D. Ciltti, Pearson Education, 5th Edition
2. Digital fundamentals – Thomas Floyd &R.P. Jain, Pearson Education (2005)

References:

1. Digital Principles and Applications – by Malvino & Leach , McGraw-Hill,
2. Fundamentals of digital circuits - A. Anand Kumar, PHI Learning Pvt. Ltd.,2003
3. Digital computer fundamentals - Thomas. C. Bartee, McGraw-Hill , 1985