DEPARTMENT OF COMPUTER SCIENCE				*CLASS: I B.Sc. Computer Science*				
Semester	**Course Type**	**Course Code**	**Course Title**	**Credits**	**Contact Hours/week**	**CIA**	**Ext**	**Total**
I	Major Core - 2	20U1DMC2	Digital Computer Fundamentals	3	4	25	75	100

Course Objectives:

This is designed to understand fundamental concepts and features digital Computer and lead to learn the building blocks of the digital computer system

Units	**Digital computer fundamentals --Course Contents**	**Total Hours: 60**
Unit -I	Number Systems and Codes: Number System – Base Conversion – Binary Codes – Code Conversion. Digital Logic: Logic Gates – Truth Tables – Universal Gates.	12 hrs
Unit-2	Boolean Algebra: Laws and Theorems – SOP, POS Methods – Simplification of Boolean Functions – Using Theorems, K-Map, Prime – Implicant Method – Binary Arithmetic: Binary Addition – Subtraction – Various Representations of Binary Numbers – Arithmetic Building Blocks – Adder – Subtractor.	12 hrs
Unit-3	Combinational Logic: Multiplexers – De-multiplexers – Decoders – Encoders – Code Converters – Parity Generators and Checkers.	12 hrs
Unit-4	Sequential Logic: RS, JK, D, and T Flip-Flops – Master-Slave Flip-Flops. Registers: Shift Registers – Types of Shift Registers.	12 hrs
Unit-5	Counters: Asynchronous and Synchronous Counters - Ripple, Mod, Up-Down Counters– Ring Counters. Memory: Basic Terms and Ideas –Types of ROMs – Types of RAMs.	12 hrs

Text Book

1. V.Rajaraman and T.Radhakrishnan, *Digital Computer Design*, Prentice Hall of India, 2001
2. D.P.Leach and A.P.Malvino, *Digital Principles and Applications* – TMH – Fifth Edition – 2002.
3. M. Moris Mano, *Digital Logic and Computer Design*, PHI, 2001.
4. T.C.Bartee, *Digital Computer Fundamentals*, 6th Edition, Tata McGraw Hill, 1991.

Lesson Plan:

Unit	Topics	Hrs	Mode
Unit I	Number Systems and Codes: Number System – Base Conversion	3	Chalk and talk, Quiz and assignment
	Binary Codes – Code Conversion.	2	
	Digital Logic: Logic Gates	2	
	Truth Tables	3	
	Universal Gates	2	
Unit II	Boolean Algebra: Laws and Theorems – SOP, POS Methods – Simplification of Boolean Functions	2	Chalk and talk, Group discussion
	Using Theorems, K-Map, Prime – Implicant Method	3	
	Binary Arithmetic: Binary Addition – Subtraction	3	
	Various Representations of Binary Numbers	2	
	Arithmetic Building Blocks – Adder – Subtractor	2	
Unit III	Combinational Logic: Multiplexers – De-multiplexers	3	Chalk and talk, Quiz and assignment
	Decoders – Encoders	3	
	Code Converters	3	
	Parity Generators and Checkers	3	
Unit IV	Sequential Logic: RS, JK, D, and T Flip-Flops	3	PPT, Chalk and talk, Quiz and assignment
	Master-Slave Flip-Flops.	3	
	Registers: Shift Registers	3	
	Types of Shift Registers	3	
Unit V	Counters: Asynchronous and Synchronous Counters - Ripple,	2	PPT, Chalk and talk, Quiz and assignment
	Mod, Up-Down Counters	3	
	Ring Counters. Memory: Basic Terms and Ideas	3	
	Types of ROMs	2	
	Types of RAMs.	2	

COURSE LEARNING OUTCOMES:

On the completion of the course the students will be able to

	COURSE LEARNING OUTCOME	Knowledge Level (basis of Bloom's Taxonomy)
CLO-1	Build simple logic circuits using basic gates and universal logic gates.	K3
CLO-2	Illustrate the basic idea about number systems and to learn conversion from one number system to another number system.	K3
CLO-3	Discuss about various data processing circuits.	K2,K3
CLO-4	Identify the operations and characteristics of clocks and timer circuits.	K4
CLO-5	Analyse and construct various flip-flops and counters.	K4

MAPPING OF CLOs WITH PSOs:

Course Learning Outcomes	PSO 1 (Knowledge Base)	PSO 2 (Problem Analysis & Investigation)	PSO 3 (Communication Skills & Design)	PSO 4 (Individual and Team Work)	PSO 5 (Professionalism Ethics and equity)	PSO 6 (Life Long Learning)
CLO-1	3	2	2	3	1	1
CLO-2	1	2	2	1	2	1
CLO-3	3	2	3	3	1	2
CLO-4	2	2	3	1	2	3
CLO-5	2	2	3	2	2	3

3- Advanced Application 2- Intermediate 1- Introductory