



C.U.SHAH UNIVERSITY

FACULTY OF: - Technology & Engineering

DEPARTMENT OF: -Instrumentation & Control Engineering

SEMESTER: - III

COURSE:- B.Tech

CODE: - 4TE03DCI1

NAME – Digital Circuits

Teaching & Evaluation Scheme

Subject Code	Name of the Subject	Teaching Scheme (Hours)				Credits	Evaluation Scheme							
		Th	Tu	Pr	Total		Theory				Practical (Marks)			Pr
							Sessional Exam		University Exam		Internal		University	
							Marks	Hrs	Marks	Hrs	Pr/Viva	TW	Pr	
4TE03DCI1	Digital Circuits	4	0	2	6	5	30	1.5	70	3	30	20	---	150

Objectives

- To study various number systems and to simplify the mathematical expressions using Boolean functions.
- To study design and implementation of combinational circuits
- To study the design of various synchronous and asynchronous circuits.
- To expose the students to various memory devices.

Prerequisites

- Basics of Number Systems and Elementary Algebra

Course Outlines

Sr. No.	Course Contents	No Of Hours
1	Binary System: Digital computer and digital systems, Binary Number, Number base conversion Octal and Hexadecimal Number, complements, Binary Codes, Binary Storage and register, Binary Logic, Integrated Circuit	6
2	Boolean Algebra and Logic Gates : Basic Definition, Axiomatic Definition of Boolean Algebra, Basic Theorem and Properties of Boolean Algebra, Minterms And Maxterms, Logic Operations, Digital Logic Gates, IC digital Logic Families	7
3	Simplification of Boolean Functions: Different types Map method, Product of sum Simplification, NAND or NOR implementation, Don't Care condition, Tabulation method	7

Sr. No.	Course Contents	No Of Hours
4	Combinational Logic : Introduction, Design Procedure, adder, subtractor, Code Conversion, Universal Gate	6
5	Combinational Logic With MSI AND LSI : Introduction, Binary Parallel Adder, Decimal Adder, Magnitude Comparator, Decoder, Multiplexer, ROM, Programmable Logic Array.	6
6	Sequential Logic: Introduction, Flip-Flops, Triggering of Flip-Flops, Analysis of Clocked Sequential Circuits, State Reduction and Assignment, Flip-Flop Excitation Tables, Design Procedure, Design of Counters, Design with State Equations	7
7	Registers Transfer Logic & Micro-Operation : Introduction, Inter-register Transfer, Arithmetic, logic and shift Micro-Operations, Conditional Control Statements, Fixed-Point Binary Data, overflow, Arithmetic Shifts, Decimal Data, Floating-Point Data, Instruction Codes, Design of Simple Computer	8
8	Registers, Counters and the Memory unit : Introduction, Registers, Shift Registers, Ripple Counters, Synchronous Counters, Timing Sequences, Memory Unit	5

Learning Outcomes

- The students would be able to design and implement simple digital circuits after studying this course. They will also be adept with the basics of sequential circuits and memory units which in turn will benefit them while studying Microprocessors and Microcontrollers.

Books Recommended

- Digital Logic and Computer Design By M Morris Mano - Pearson Education
- Principle of digital Electronics By Malvino & Leach - Tata Mcgraw Hill
- Modern Digital Electronics By R.P.Jain - Tata McGraw-Hill