Course Title	**Digital Logic Design**		
Course Code	**CC-110**		
Credit Hours	3 (3,0)		
Category	Computing core		
Prerequisite	None		
Co-Requisite	None		
Follow-up	CC-111 Computer Organization & Architecture		
Course Introduction	The course introduces the concept of digital logic, gates and the digital circuits. Further, it focuses on the design and analysis combinational and sequential circuits. It also serves to familiarize the student with the logic design of basic computer hardware components.		
Course Learning Outcomes (CLOs)	At the end of the course, the students will be able to:	**BT**	**PLO**
	CLO1: Acquire the basic knowledge of logic gates and digital logic circuits	C1 (Acquire)	1
	CLO2: Understand the working of the fundamental digital circuits used in digital systems and computers.	C2 (Understand)	1,2
	CLO3: Implement simple digital circuits using logic gates. Designing a digital circuit for implementing a given scenario.	C3 (Apply)	3, 4
	CLO4: Analyze the behavior of digital systems using truth tables and Boolean algebra	C4 (Analyze)	3,4
Syllabus	**Topics:** Introduction to Digital Systems, Number Systems, Introduction to Boolean Algebra, Basic theorems and properties of Boolean Algebra, Boolean Functions, Logic Gates, NAND and NOR Implementation, Representation of Function in Sum of Minterms or Product of Maxterms, Simplification of Boolean function using Karnaugh Map, Don't care Conditions, The Tabulation Method, Introduction to Combinational Logic, Design of Adders, Design of Subtractors, Code Convertors, Analysis Procedure of Combinational Circuits, Binary Parallel Adders, Decimal Adders, Magnitude Comparator, Decoders and its applications, Multiplexers, Demultiplexers, Encoders, ROM, Programmable Logic Array (PLA), Introduction to Sequential Circuits, Basic Flip Flop, Clocked RS Flip Flop, Clocked D Flip Flop, Clocked JK Flip Flop, Clocked T Flip Flop, Analysis of Clocked Sequential Circuits, State Reduction and Assignment, Flip Flop Excitation tables, Design Procedure, Design of Counters, Design with State Equations, Introduction to Registers, Shift Registers, Ripple Counters, Synchronous Counters , Timing Sequences, Memory Unit, Random Access Memory. Introduction Programmable Logic Devices (CPLD, FPGA), Lab Assignments using tools such as Verilog HDL/VHDL, MultiSim.		
Suggested Instructional/ Reading Material	1. M. Morris Mano, Digital Logic and Computer Design, 1st Edition, Pearson, 1979, ISBN: 0132145103. 2. Thomas L. Floyd, Digital Fundamentals, 10th Edition, Prentice Hall, 2008, ISBN: 0132359235. 3. Fundamental of Digital Logic with Verilog Design, Stephen Brown, 2/e		