

NAME OF THE SUBJECT		L	T	P	C
DIGITAL ELECTRONICS		3	0	0	3
Unit 1		(12 Hours)			
Number Systems and Codes: Binary, Octal, Hexadecimal, and Decimal Number System and their Conversion; Representation of Signed Binary and Floating-Point Number; Binary Arithmetic using 1's and 2's Complements, Binary Codes - BCD Code, Gray Code, ASCII Character Code.					
Boolean Algebra and Logic Gates: Axioms and Laws of Boolean Algebra; Reducing Boolean Expressions; Logic Levels and Pulse Waveforms; Logic Gates; Boolean Expressions and Logic Diagrams; Canonical and Standard Forms.					
Unit 2		(12 Hours)			
Gate-level Minimization: K-maps - Two, Three, and Four Variable K-maps, Don't-Care Conditions; NAND and NOR Implementation; Other Two-Level Implementations, Exclusive-OR Function.					
Combinational Logic: Combinational Circuits; Analysis Procedure; Design Procedure; Adders; Subtractors; Parallel Binary Adders; Binary Adder-Subtractor; Binary Multiplier; Magnitude Comparator; Decoders; Encoders; Multiplexers; De-multiplexers.					
Unit 3		(12 Hours)			
Synchronous Sequential Logic: Sequential Circuits; Storage Elements: Latches, Flip-Flops, Master-Slave Flip-Flop; Conversion of Flip-Flops; Analysis of Clocked Sequential Circuits; Mealy and Moore Models of Finite State Machines; Design Procedure.					
Registers and Counters: Shift Registers; Data Transmission in Shift Registers; SISO, SIPO, PISO, and PIPO Shift Registers; Counters; Asynchronous Counters; Design of Asynchronous Counters; Synchronous Counters; Design of Synchronous Counters; Ring Counter.					
Unit 4		(8 Hours)			
Memory and Programmable Logic: Introduction; Random-Access Memory; Memory Decoding; Error Detection and Correction; Read-Only Memory; Programmable Logic Array; Programmable Array Logic; Sequential Programmable Devices.					
Text Books:					
1. M. Morris Mano, and Michael D. Ciletti, <i>Digital Design: With an Introduction to the Verilog HDL, VHDL, and SystemVerilog</i> . Pearson Education, Sixth Edition, 2017.					
2. Anand Kumar, <i>Fundamentals of Digital Circuits</i> . PHI Learning Pvt. Ltd., New Delhi, Fourth Edition, 2016.					
3. R. P. Jain, <i>Modern Digital Electronics</i> . Tata McGraw-Hill Education Pvt. Ltd., Fourth Edition, 2009.					
Reference Books:					
1. John P. Uyemura, <i>A First Course in Digital Systems Design: An Integrated Approach</i> . Thomson Press (India) Ltd., India Edition, 2002.					
2. William H. Gothmann, <i>Digital Electronics: An Introduction to Theory and Practice</i> , PHI Learning Pvt. Ltd., New Delhi, Second Edition, 2006.					
3. D.V. Hall, <i>Digital Circuits and Systems</i> . Tata McGraw-Hill Education Pvt. Ltd., 1989.					
4. Charles H. Roth, <i>Digital System Design using VHDL</i> . Tata McGraw-Hill Education Pvt. Ltd., Second Edition, 2012.					