

PEI4I103 DIGITAL ELECTRONICS

University level 80%

MODULE – I (12 Hours)

1. Number System: Introduction to various number systems and their Conversion. Arithmetic Operation using 1's and 2's Compliments, Signed Binary and Floating Point Number Representation Introduction to Binary codes and their applications. (5 Hours)
2. Boolean Algebra and Logic Gates: Boolean algebra and identities, Complete Logic set, logic gates and truth tables. Universal logic gates, Algebraic Reduction and realization using logic gates (3 Hours)
3. Combinational Logic Design: Specifying the Problem, Canonical Logic Forms, Extracting Canonical Forms, EX-OR Equivalence Operations, Logic Array, K-Maps: Two, Three and Four variable K-maps, NAND and NOR Logic Implementations. (4 Hours)

MODULE – II (14 Hours)

4. Logic Components: Concept of Digital Components, Binary Adders, Subtraction and Multiplication, An Equality Detector and comparator, Line Decoder, encoders, Multiplexers and De-multiplexers. (5 Hours)
5. Synchronous Sequential logic Design: sequential circuits, storage elements: Latches (SR, D), Storage elements: Flip-Flops inclusion of Master-Slave, characteristics equation and state diagram of each FFs and Conversion of Flip-Flops. Analysis of Clocked Sequential circuits and Mealy and Moore Models of Finite State Machines (6 Hours)
6. Binary Counters : Introduction, Principle and design of synchronous and asynchronous counters, Design of MOD-N counters, Ring counters. Decade counters, State Diagram of binary counters (4 hour)

MODULE – III (12 hours)

7. Shift registers: Principle of 4-bit shift registers. Shifting principle, Timing Diagram, SISO, SIPO ,PISO and PIPO registers. (4 hour)
8. Memory and Programmable Logic: Types of Memories, Memory Decoding, error detection and correction), RAM and ROMs. Programmable Logic Array, Programmable Array Logic, Sequential Programmable Devices. (5 Hours)
9. IC Logic Families: Properties DTL, RTL, TTL, I²L and CMOS and its gate level implementation. A/D converters and D/A converters (4 Hours)

Text book

1. *Digital Design, 3rd Edition, Moris M. Mano, Pearson Education.*
2. *Fundamentals of digital circuits, 8th edition, A. Anand Kumar, PHI*
3. *Digital Fundamentals, 5th Edition, T.L. Floyd and R.P. Jain, Pearson Education, New Delhi.*

Reference Book

1. *Digital Systems – Principles and Applications, 10th Edition, Ronald J. Tocci, Neal S. Widemer and Gregory L. Moss, Pearson Education.*
2. *A First Course in Digital System Design: An Integrated Approach, India Edition, John P. Uyemura, PWS Publishing Company, a division of Thomson Learning Inc.*
3. *Digital Systems – Principles and Applications, 10th Edition, Ronald J. Tocci, Neal S. Widemer and Gregory L. Moss, Pearson Education.*
4. *Digital Design, Robert K. Dueck, CENGAGE Learning.: 1. Digital Principles and Applications, 6th Edition, Donald P. Leach, Albert Paul Malvino and GoutamSaha,*