I Year-II Semester		L	T	P	C
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Digital Logic Design (ES1213)					

Prerequisite Course: Students require Basic knowledge of Electronic Devices and Circuits

Course Description and Objectives:

- To study the basic philosophy underlying the various number systems, negative number representation, binary arithmetic, theory of Boolean algebra and map method for minimization of switching functions
- To introduce the basic tools for design of combinational and sequential digital logic.
- To learn simple digital circuits in preparation for computer engineering

Course Outcomes:

Upon completion of the course, the student will be able to achieve the following outcomes.

CO	Course Outcomes	POs
1	Classify different number systems and apply to generate various codes.	**3**
2	Use the concept of Boolean algebra in minimization of switching functions	**3**
3	Design different types of combinational logic circuits.	**3**
4	Apply knowledge of flip-flops in designing of Registers and counters	**3**
5	The operation and design methodology for synchronous sequential circuits and algorithmic state machines.	**3**

Syllabus:

UNIT- I:

Digital Systems and Binary Numbers Digital Systems, Binary Numbers, Octal and Hexadecimal Numbers, Complements of Numbers, Signed Binary Numbers, Arithmetic addition and subtraction, 4-bit codes: BCD, EXCESS 3, alphanumeric codes, 9's complement, 2421, etc..

UNIT -II:

Concept of Boolean algebra Basic Theorems and Properties of Boolean algebra, Boolean Functions, Canonical and Standard Forms, Minterms and Maxterms. Gate level Minimization Map Method, Three-Variable K-Map, Four Variable K-Maps. Products of Sum Simplification, Sum of Products Simplification, Don't – Care Conditions, NAND and NOR Implementation, Exclusive-OR Function.

UNIT- III

Combinational Logic Introduction, Analysis Procedure, Binary Adder–Subtractor, Binary Multiplier, Decoders, Encoders, Multiplexers, Demultiplexers, Priority Encoder, Code Converters, Magnitude Comparator, HDL Models of Combinational Circuits. Realization of Switching Functions Using PROM, PAL and PLA

UNIT- IV:

Synchronous Sequential Logic Introduction to Sequential Circuits, Storage Elements: Latches, Flip-Flops, RS-Latch Using NAND and NOR Gates, Truth Tables. RS, JK, T and D Flip Flops, Truth and Excitation Tables, Conversion of Flip Flops. UNIT -V: Registers and Counters Registers, Shift Registers, Ripple Counters, Synchronous Counters, Ring Counter ,Johnson Counter

TEXT BOOKS:

1. Digital Design, 5/e, M.Morris Mano, Michael D Ciletti, PEA
2. Fundamentals of Logic Design, 5/e, Roth, Cengage. REFERENCE BOOKS: 1. Digital Logic and Computer Design, M.Morris Mano, PEA.

REFERENCE BOOKS:

1. Digital Logic and Computer Design, M.Morris Mano, PEA.
2. Digital Logic Design, Leach, Malvino, Saha, TMH.
3. Modern Digital Electronics, R.P. Jain, TMH.