EC213	DIGITAL ELECTRONICS & LOGIC DESIGN	L	T	P	C	Int	Ext
		3	-	-	3	30	70

COURSE OBJECTIVES:

1. know the concepts of different number systems, conversions and functionality of logic gates
2. To analyze and design combinational logic circuits
3. To analyze and design sequential logic circuits.
4. Understand Programmable logic devices and various logic families.

COURSE OUTCOMES:

On successful completion of the course, students will be able to

1. Demonstrate the knowledge in number systems, Boolean algebra, Combinational, sequential circuits, Programmable logic devices and Logic families.
2. Analyze and Design various combinational Circuits
3. Analyze and Design various sequential Circuits
4. Implement combinational circuit functionality with Programmable logic devices.

UNIT I [CO:1,2,3,4] **(12)**

Digital Systems:

Digital Systems, Binary Numbers, Number-Base Conversions, Octal and Hexadecimal Numbers, complements, signed binary Numbers, Binary codes and Error detection and correction using parity bits and hamming code.

Boolean Algebra & Logic Gates:

Basic Definitions, Axiomatic Definition of Boolean Algebra, Basic theorems and Properties of Boolean Algebra, Boolean functions, Canonical and Standard Forms, Other logic operations, Digital Logic gates, EX-OR,EX-NOR applications.

Gate-Level Minimization:

The Map Method, Four-Variable K-Map, Five-Variable K-Map, Product of sums simplification, Don't-Care conditions, NAND and NOR implementation, Other Two-Level implementations, Quine McCluskey (QM) Technique

UNIT II [CO:1,2,3] **(12)**

Combinational Logic:

Combinational Circuits, Analysis Procedure, Design procedure, Half adder, Full adder , Half subtractor, Full subtractor, Binary adder-Sub tractor, Carry look ahead adder, Decimal Adder, Binary multiplier, Magnitude comparator, Encoders, Priority encoder, Decoders, BCD to seven segment display, Multiplexers, Demultiplexers.

UNIT III [CO:1,2,3] **(12)**

Synchronous and sequential Logic:

Sequential circuits, Latches, Flip-Fops, Analysis of clocked Sequential circuits, State Reduction and Assignment, Design Procedure.

Registers and Counters:

Registers, Shift Registers, Ripple Counters, Synchronous Counters, Other Counters

UNIT IV [CO:1,4] **(12)**

Sequential detector, Programmable Read-Only Memory, Programmable Logic Array, Programmable Array Logic, Sequential Programmable Devices.

Digital Integrated Circuits:

Introduction, Special Characteristics, Bipolar-Transistor Characteristics, RTL and DTL Circuits, Transistor Transistor Logic (TTL): Open Collector, Totem pole output, Tristate Logic, Emitter Coupled Logic (ECL), Metal-Oxide Semiconductor(MOS), Complementary MOS(CMOS).

LEARNING RESOURCES:

TEXT BOOK:

M.Morris Mano, Michael D. Ciletti- "Digital Design", 4thEdition, Pearson Education, 2006.

REFERENCE BOOK(s):

1. Z.Kohavi - "Switching and Finite Automata Theory", Tata McGraw Hill.
2. R.P.Jain - Modern digital electronics, McGraw Hill, 4thEdition.

WEB RESOURCES:

1. http://nptel.ac.in/courses/108/105/108105132/
2. http://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-111-introductory