III B.Tech - I Semester
(20EC5702) SWITCHING THEORY AND LOGIC DESIGN
(Minors)

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
30	70	100	3	1	-	4

Pre-Requisites: None

Course Objectives:

- To understand about different number systems and basic logic operations.
- Apply minimization techniques for optimization.
- To design and analyze the combinational logic circuits.
- Understand and analyze various PLDs and Memories.
- To design and analyze the sequential logic circuits.

UNIT–I:
Review of Number Systems & Codes:
Representation of numbers of different radix, conversion from one radix to another radix, r-1's compliments and r's compliments of signed members, problem solving. 4 bit codes, BCD, Excess-3, 2421, 84-2-1, Gray code, Hamming code. Basic logic operations -NOT, OR, AND, Universal gates, EX-OR, EX-NOR - Gates, Standard SOP and POS, Forms, NAND-NAND and NOR-NOR realizations.

UNIT–II:
Minimization Techniques:
Boolean theorems, principle of complementation & duality, De-Morgan theorems, minimization of logic functions using Boolean theorems, minimization of switching functions using K-Map up to 4 variables.

UNIT–III:
Combinational Logic Circuits Design:
Design of Half adder, full adder, half subtractor, full subtractor, applications of full adders, 4-bit binary subtractor, adder-subtractor circuit, Design of decoder, encoder, multiplexer, demultiplexer.

UNIT–IV:
Introduction of PLDs and Memories:
RAM (SRAM, DRAM), ROM, PROM, PAL, PLA-Basics structures, realization of Boolean function with PLDs, programming tables of PLDs, merits & demerits of PROM, PAL, PLA.

UNIT–V:
Sequential Circuits:
Classification of sequential circuits (synchronous and asynchronous), latches, flip-flops, truth tables and excitation tables (Nand RS latch, Nor RS latch, RS flip-flop, JK flip-flop, T flip-flop, D flip-flop), shift register, counters (ripple counters, synchronous counters, Johnson counter, ring counter).

Course Outcomes:

After successful completion of the course, the students can be able to

S. No	Course Outcome	BTL
1.	Acquire Knowledge on number systems and Basic logic operations.	L2
2.	Realize the logic functions using K-map.	L3
3.	Design and analyze the combinational logic circuits.	L4
4.	Understand the concept of PLDs and Memories.	L2
5.	Design and analyze the sequential logic circuits.	L4

Correlation of COs with POs & PSOs:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO 1	3	1	1	-	-	-	-	-	-	-	-	-	2	-
CO 2	3	2	-	-	-	-	-	-	-	-	-	-	2	-
CO 3	2	2	2	-	-	-	-	-	-	-	-	-	3	-
CO 4	3	2	2	-	-	-	-	-	-	-	-	-	3	-
CO 5	3	2	2	-	-	-	-	-	-	-	-	-	3	-

Text Books:

1. Switching Theory and Logic Design by Hill and Peterson Mc-Graw Hill TMH edition.
2. Switching Theory and Logic Design by A. Anand Kumar.
3. Digital Design by Mano PHI.

Reference Books:

1. Modern Digital Electronics by RP Jain, TMH.
2. Fundamentals of Logic Design by Charles H. Roth Jr, Jaico Publishers.
3. Micro electronics by Millman MH edition.