SCHEME OF COURSE WORK

Department of Information Technology

Course Details:

COURSE TITLE	SWITCHING THEORY & LOGIC DESIGN		
COURSE CODE	13EC1105	COURSE CODE	13EC1105
PROGRAM	B.TECH		
SPECIALIZATION	ECE, EEE, CSE, IT		
SEMESTER	III		
PRE REQUISITES	N/A		
COURSES TO WHICH IT IS A PRE REQUISITE	N/A		

Course Outcomes (COs):

Convert one number system to other.
Implement logic circuits and simplify logic expressions
Design Combinational logic circuits through expressions
Illustrate the concept of sequential logic design, analyze the operation of flip-flop and design various types of sequential circuits.
Differentiate Mealy & Moore models and Simplify and Design Sequential machines

Course Outcome versus **Program Outcomes**

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	M				M							
CO2					S							
CO3					S							
CO4					M							
CO5					M							

S - Strongly correlated, *M* - *Moderately* correlated, *Blank* - *No correlation*

Assessment Methods	Assignment / Quiz / Mid-Test

Teaching- Learning & Evaluation

Week	Topic/ Contents	Course Outcomes	Sample questions	Teaching learning strategy	Assessment method & schedule
1	Number system conversions, complements	CO1	Examples on various number system conversions, Problems on complements	Lecturing, problem solving	Assignment-1, Test- 1 Quiz-1
2	Subtraction using complements, 8421, 24-2-1, excess-3, gray code and BCD code and BCD Addition	CO1	Perform subtraction using 2's complement, 10's complement	Lecturing, problem solving	Assignment-1, Test- 1 Quiz-1
3	ASCII character code, error detection codes, binary logic- AND, OR, NOT, representations, truth tables, Boolean algebra, basic theorems	CO1, CO2	Write truth tables for AND, OR & NOT State and prove various Boolean algebra laws with respect to AND & OR	Lecturing, problem solving	Assignment-1, Test- 1 Quiz-1
4	Complement of a function, standard and canonical forms	CO2	Examples of converting various Boolean functions into sum of products form and product of sums form	Lecturing, problem solving	Assignment-1, Test- 1 Quiz-1
5	Gate level minimization, 2, 3, 4 variable k- maps	CO2	Minimizing various Boolean functions using 2, 3, and 4 variable k- maps	Lecturing, problem solving	Assignment-1, Test- 1 Quiz-1
6	5- variable maps, prime implicants and essential prime implicants, don't care conditions, nand and nor implementations, ex-or implementations, Quine- Mc Cluskey Method or tabular method	CO2	Minimizing Boolean functions by identifying prime implicants and essential prime implicants using tabular method,	Lecturing, problem solving	Assignment-1, Test- 1 Quiz-1
7	Introduction to combinational logic circuit, half and full adders	CO3	Design a full adder using 2 half adders and an or gate	Lecturing, problem solving	Assignment-1,2, Quiz-1, Test-1, 2
8	Subtractors- half and full subtractors, binary/ parallel adder	CO3	Design a full subtractor using 2 half subtractors and AND gate	Lecturing, problem solving	Assignment-2, Test- 2, Quiz-2
9	**Test 1**				
10	Decoders, encoders, multiplexers, code converters,	CO3	Implementing high level decoders with lower level decoders Implementing Boolean	Lecturing, problem solving	Assignment-2, Test- 2, Quiz-2

			functions using various types of multiplexers Designing various code converters		
11	Programmable logic and memory, hamming code, types of ROM	CO3	Identifying errors in the message using hamming code	Lecturing, problem solving	Assignment-2, Test- 2, Quiz-2
12	Design of PLA, PAL & PROM Circuits	CO3	Designing PLA & PAL circuits for various Boolean functions		
12	Introduction to sequential circuits, latches, flip flops, characteristic tables and excitation tables of flip flops	CO4	Write the characteristic tables and excitations of SR, JK, D & T Flip Flops	Lecturing, problem solving	Assignment-2, Test- 2, Quiz-2
13	Flip flop conversions, counters- design of ripple counters and synchronous counters, asynchronous counters	CO4	Design mod-n counters of both ripple and synchronous types	Lecturing, problem solving	Assignment-2, Test- 2, Quiz-2
14	Registers, shift registers, SISO, PISO, SIPO, PIPO, bidirectional and universal shift registers, ring counters, twisted ring counters	CO4	Write about universal shift registers with a neat diagram Design ring counter and twisted ring counter for some arbitrary sequence and desired sequence	Lecturing, problem solving	Assignment-2, Test- 2, Quiz-2
15	Introduction to finite state machines, mealy and moore machines, serial binary adder- realization using mealy and moore machines, sequence detector	CO5	Distinguish mealy and moore machines with the help of examples Design a sequence detector for 10010 using mealy machine	Lecturing, problem solving	Assignment-2, Test- 2, Quiz-2
16	Equivalence between states, state minimization using partitioning technique, merger graphs, merger tables,	CO5	Minimizing the state table using partitioning techniques	Lecturing, problem solving	Assignment-2, Test- 2, Quiz-2
17	Algorithmic state machines, introduction, design, data path and control path for binary multiplier, weighing machine	CO5	What is an ASM? Write the features of ASM. Design ASM for binary multiplier over 110 and 101 Design ASM for weighing machine	Lecturing, problem solving	Assignment-2, Test- 2, Quiz-2
18	**Test 2**				