

DIGITAL SYSTEM DESIGN

Course Code	19EC4501C	Year	III	Semester	I
Course Category	Program Elective-I	Branch	ECE	Course Type	Theory
Credits	3	L-T-P	3-0-0	Prerequisites	Digital Logic Design
Continuous Internal Evaluation:	30	Semester End Evaluation:	70	Total Marks:	100

Course Outcomes

Upon successful completion of the course, the student will be able to

CO1	Understand Memories and Programmable Logic Devices (L2).
CO2	Analyze algorithmic state machines and asynchronous sequential circuits (L4).
CO3	Design logic gates using different logic families(L5)
CO4	Impart the basics of functional verification languages (L2)

Mapping of course outcomes with Program outcomes (CO/ PO/PSO Matrix)

Note: 1- Weak correlation 2-Medium correlation 3-Strong correlation

* - Average value indicates course correlation strength with mapped PO

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2
CO1	3		3		3					3			3	
CO2	3		3		3					3			3	
CO3	3	3								3			3	
CO4	3	3								3			3	
Average* (Rounded to nearest integer)	3	3	3	3	3					3			3	

Syllabus

Unit No.	Contents	Mapped CO
I	MEMORY AND PROGRAMMABLE LOGIC: Introduction, Random Access Memory, Memory Decoding, Error Detection and Correction, Read-Only Memory, Programmable Logic Array, Programmable Array Logic.	CO1
II	DESIGN AT THE REGISTER TRANSFER LEVEL: Introduction, Register Transfer Level (RTL) Notation, RTL Descriptions, Algorithmic State Machines(ASMs), Design Example (ASMD CHART), HDL Description of Design Example, Sequential Binary Multiplier, Control Logic, HDL Description of Binary Multiplier, Design with Multiplexers, Race-Free Design, Latch-Free Design.	CO2
III	ASYNCHRONOUS SEQUENTIAL LOGIC: Introduction, Analysis Procedure, Circuits with Latches, Design Procedure, Reduction of state and flow tables, Hazards, Design Example.	CO2

IV	DIGITAL INTEGRATED CIRCUITS: Introduction, Special Characteristics, Bipolar-Transistor Characteristics, RTL and DTL circuits, Transistor-Transistor Logic, Emitter Coupled Logic, Metal-Oxide Semiconductor, Complementary MOS, CMOS Transmission Gate circuits.	CO3
V	SYSTEM VERILOG INTRODUCTION: System Verilog Origins-The Accellera System Verilog Standard, Donations to System Verilog, Key System Verilog enhancements for hardware design.	CO4

Learning Resources

Text Books

- | |
|--|
| <ol style="list-style-type: none"> 1. Digital Design-M. Morris Mano, Michael D.Ciletti- 6th Edition, Pearson Publishers 2. System Verilog for Design- Stuart Sutherland, Simon Davidmann, Peter Flake |
|--|

Reference Books

- | |
|--|
| <ol style="list-style-type: none"> 1. Digital Design- John F.Wakerly- 4th Edition, PHI |
|--|
