

**PRASAD V. POTLURI SIDDHARTHA INSTITUTE OF TECHNOLOGY KANURU,  
VIJAYAWADA**

**Department of Computer Science and Engineering**

II B.Tech – I Semester

20CS3301

**Fundamentals of Digital Logic Design**

CO	Statement	Skill	Blooms	Units
<b>CO1</b>	Understand the basic concepts of digital circuits.	Understand	L2	1,2,3,4,5
<b>CO2</b>	Apply minimization techniques to simplify Boolean expressions.	Apply, Communication	L3	2
<b>CO3</b>	Apply the principles of digital electronics to design combinational and sequential circuits.	Apply	L3	3,4,5
<b>CO4</b>	Analyze the functionality of combinational circuits and sequential circuits.	Analyze, Individual Performance, Communication	L4	3,4,5

<b>Fundamentals of Digital Logic Design</b>		
<b>Unit No.</b>	<b>Contents</b>	<b>Mapped CO</b>
I	<b>Digital Systems and Binary Numbers:</b> Digital Systems, Binary Numbers, Number Base Conversions, Octal and Hexadecimal Numbers, Complements of Numbers, Signed Binary Numbers, Binary codes and Binary Logic.	<b>CO1</b>
II	<b>Boolean Algebra and Logic Gates:</b> Introduction, Basic Definitions, Axiomatic definition of Boolean Algebra, Basic theorems and properties of Boolean Algebra, Boolean functions, Canonical and Standard Forms. <b>Gate-Level Minimization:</b> Introduction, Map Method-Two variable, Three variable K-map's, Four Variable K-Map, Product of Sums Simplification, Don't Care Conditions, NAND and NOR implementation.	<b>CO1, CO2</b>
III	<b>Combinational Logic:</b> Introduction, Combinational Circuit, Analysis Procedure, Design Procedure, Binary adder - subtractor, Decimal Adder, BCD to Seven Segment Display, Encoders, Decoder, Multiplexers, Demultiplexers.	<b>CO1, CO3, CO4</b>
IV	<b>Sequential Logic:</b> Introduction, <b>Storage Elements:</b> Latches –SR, D Latches	<b>CO1, CO3, CO4</b>

	<b>Storage Elements: Flip Flops</b> –SR, JK, D and T Flip Flops, Characteristic tables, Characteristic equation, Excitation tables.	
V	<b>Registers and Counters:</b> Registers, <b>Shift Registers</b> - Serial Transfer, Serial Addition, Universal Shift Register, <b>Ripple Counters</b> - Binary Ripple Counter, BCD Ripple Counter, <b>Synchronous Counters</b> -Binary Counter, Up–Down Binary Counter, BCD Counter, Binary Counter with Parallel Load, <b>Other Counters</b> - Ring counter, Johnson counter.	<b>CO1, CO3, CO4</b>

### CO-PO Mapping

Contribution of Course Outcomes towards achievement of Program Outcomes														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	√													
CO2	√									√				
CO3													√	
CO4		√							√	√				

### Strength of Correlation

Distribution of marks weightage to PO's through CO's.

- The strength of correlation levels is based on percentage of marks distribution towards PO.

CIE	Test	Test Number	Marks
	Objective Exam (10)	Objective Exam -1	10
		Objective Exam -2	10
	Assignment (5)	Assignment -1	5
		Assignment - 2	5
	Descriptive Exam (15)	Descriptive Exam - 1	15
		Descriptive Exam - 2	15

CO	Skill	Blooms	Units	Assessing Tools can be used to measure CO (CIE) Marks	Assessing Tools can be used to measure CO (SEE) Marks
CO1	Understand	L2	1,2,3,4,5	Objective Exam-10 Descriptive Exam –2.5	21
CO2	Apply, Communication	L3	2	Descriptive Exam –2.5 Assignment – 2 (1.5+0.5)	14
CO3	Apply	L3	3,4,5	Descriptive Exam –7.5 Assignment –0.5	21
CO4	Analyze, Individual Performance, Communication	L4	3,4,5	Descriptive Exam –2.5 Assignment – 2.5 (1.5+0.5+0.5)	14

### Strength of Correlation

% of questions towards PO	Level (Weight)
>=20% of total marks	3
>=10% and <20% of total marks	2
< 10% of total marks	1

CO	Skill	Bloom's	Units	Assessing tools can be used to measure CO (CIE) Marks	CIE Total	Assessing tools can be used to measure CO (SEE) Marks	Total (CIE +SEE)	Percentage (%)	Strength of Correlation	PO
CO1	Understand	L2	1,2,3,4,5	Objective Exam-10 Descriptive Exam –2.5	12.5	21	33.5	33.5%	3	PO1
CO2	Apply, Communication	L3	2	Descriptive Exam –2.5 Assignment – 2 (1.5+0.5)	4 0.5	14	18 0.5	18% 0.5%	2 1	PO1, PO10
CO3	Apply	L3	3,4,5	Descriptive Exam –7.5 Assignment – 0.5	8	21	29	29%	3	PSO1
CO4	Analyze, Individual Performance, Communication	L4	3,4,5	Descriptive Exam –2.5 Assignment – 2.5 (1.5+0.5+0.5)	4 0.5 0.5	14	18 0.5 0.5	18% 0.5% 0.5%	2 1 1	PO2 PO9 PO10

### Course Articulation Matrix:

Contribution of Course Outcomes towards achievement of Program Outcomes & Strength of correlations (3:Substantial, 2: Moderate, 1:Slight)														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
<b>CO1</b>	3													
<b>CO2</b>	2									1				
<b>CO3</b>													3	
<b>CO4</b>		2							1	1				
<b>Average</b>	<b>2.5</b>	<b>2</b>							<b>1</b>	<b>1</b>			<b>3</b>	

#### Course Coordinators

1. Dr G Lalitha Kumari
2. Dr B Lakshmi Ramani
3. Mr P Anil Kumar

#### Module Coordinators

Ms A Madhuri

#### Program Coordinator

Dr B Lakshmi Ramani