KU3DSCCSC202: DIGITAL SYSTEMS

Semester	Course Type	Course Level	Course Code	Credits	Total Hours
4	DSC	200-299	**KU3DSCCSC202**	4	60

Learning Approach (Hours/ Week)			Marks Distribution			Duration of ESE (Hours)
Lecture	Practical/ Internship	Tutorial	CE	ESE	Total	
4	0	-	30	70	100	2hrs.

Course Description:

This course introduces the principles of digital systems, covering fundamental concepts of digital and analog systems and their advantages. It includes basic logic operations, number systems, Boolean algebra, and the simplification of Boolean expressions. The course also explores combinational and sequential logic circuits, such as adders, subtractors, encoders, decoders, multiplexers, flip-flops, counters, and shift registers. Emphasis is placed on practical applications and design considerations.

Course Prerequisite: NIL

Course Outcomes:

CO No.	Expected Outcome	Learning Domains
1	Differentiate between digital and analog systems and articulate the advantages of digital systems.	U

2	Demonstrate basic logic operations and convert between various number systems used in digital electronics	A
3	Use Boolean algebra and logic gates to design and simplify digital circuits.	A
4	Design and analyze combinational circuits, including adders,	C, An
	subtractors, encoders, decoders, multiplexers, and demultiplexers.	
5	Comprehend the functioning of sequential circuits, including flipflops, counters, and shift registers, and apply this knowledge to real-world digital system designs.	U,A,C

Remember (R), Understand (U), Apply (A), Analyse (An), Evaluate (E), Create (C)

Mapping of Course Outcomes to PSOs

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO 1	3						2
CO 2	3	2					
CO 3	3	3	2				
CO 4	3	2					22
CO 5	3	2					

COURSE CONTENTS

Contents for Classroom Transaction:

MODULE	UNIT	DESCRIPTION	HOURS
1		**INTRODUCTION TO DIGITAL SYSTEMS**	12
	1	Digital and Analog Systems	
		a) Definition and comparison	
		b) Advantages of digital systems over analog systems	
	2	Introduction to basic logic operations	
		a) NOT , AND, OR Operations	
	3	Number Systems	
		a) Number systems	

		b) Number base conversion	
	4	Binary codes	
		a) BCD, Gray code	
		b) Alphanumeric codes	
		c) Error detecting codes	

2	**BOOLEAN ALGEBRA AND LOGIC GATES**		
	1	Basic Definitions	12
	2	Basic theorems and Properties of Boolean algebra	
	3	Simplification of Boolean expressions	
	4	Karnaugh maps for simplification	
	5	Digital Logic gates	

3	**COMBINATIONAL CIRCUITS**		
	1	Basic combinational logic circuits	12
	2	Combinational Circuits	
		a) Adders and Subtractors	
		b) Encoders & Decoders	
		c) multiplexers and demultiplexers	
	3	Parity generators / checkers	

4	**SEQUENTIAL LOGIC CIRCUITS**		
	1	**Flip-Flops and Latches**	
		a) SR, JK, D, T flip-flops, Master slave flip flop	12
	2	**Counters**	
		a) Synchronous and asynchronous counters	
		b) Ripple counters, up-down counters	
	3	**Shift Registers**	

		a) Different shift registers and Applications	

5	**Teacher Specific Module**	
	Directions	
	Conduct hands on training on digital devices and their working	12

Essential Readings:

1. Digital Fundamentals, Floyd and Jain, 8thEdn, Pearson Education.
2. Fundamentals of Digital Circuits" by A. Anand Kumar
3. Digital Design" by M. Morris Mano and Michael D. Ciletti

Suggested Readings:

1. Digital Logic and Computer Design, M Morris mano

Assessment Rubrics:

Evaluation Type		**Marks**	**Evaluation Type**		**Marks**	**Total**
Lecture		**70**	**Practical**		**0**	
a)	**ESE**	**70**	a)	**ESE**	**0**	
b)	**CCA**	**30**	b)	**CCA**	**0**	**100**