Assessment Rubrics:

	Marks
End Semester Evaluation	**65**
Continuous Evaluation	**35**

KU2DSCELE108: Digital Electronics

Semester	Course Type	Course Level	Course Code	Credits (L+T+P)	Total Hours (L+T+P)
2	Minor	100	KU2DSCELE108	3+0+1	45+0+30

Learning Approach (Hours/ Week)			Marks Distribution			Duration of ESE (Hours)
Lecture	Practical/ Internship	Tutorial	CE	ESE	Total	
3	2	0	35	65	100	2

Course Description:

This course aims to develop knowledge about Digital Electronics. The course cover number system, logic gates, logic families, combinational circuits, Flip flops, shift registers and counters. Practical sessions are also included in this course.

Course Prerequisite: Basic understanding of Electronics at higher secondary level

Course Outcomes:

CO No.	Expected Outcome	Learning

		Domains
1	Explain different number systems	U
2	Apply Boolean algebra rules and Karnaugh map	A
3	Compare Logic families	E
4	Develop combinational and sequential circuits	A
5	Design and develop digital circuit systems	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	2						
CO 2	2	3	2	3			
CO 3	3	2		2			
CO 4	3	3	3	3			
CO 5	3	3	2	3			3

COURSE CONTENTS

Contents for Classroom Transaction:

MODULE	**UNIT**	**DESCRIPTION**	**HOURS**
1	**Module I**		**10**
	1.1	1.1Number systems – Decimal, Binary, Octal & Hexadecimal	
	1.2	conversions, Digital codes – BCD, Excess 3, Gray code	
	1.3	Basic Logic gates (NOT, OR, AND) & derived gates (NAND, NOR, EX-OR) Symbol and truth table.	

	1.4	Boolean algebra & theorems, De Morgan's theorem, Boolean expression in SOP and POS form, conversion of SOP/POS expression to its standard SOP/POS form. Simplifications of Logic equations using Boolean algebra rules and Karnaugh map (up to 4 variables).	
2	**Module II**		**10**
	2.1	Different Logic families: TTL, CMOS, ECL & its characteristics.	
	2.2	Combinational circuits: Adders - Half adder and Full adder. Subtractors - Half and Full Subtractor.	
	2.3	Decoders - 2 to 4 & 3 to 8.	
	2.4	Encoders – Octal to Binary & Decimal to BCD, Code converters - Gray to Binary, Binary to Gray and Binary to BCD.	

3	**Module III**		**10**
	3.1	3.1 Multiplexers: 2 input, 4 input & 8 input.	
	3.2	Demultiplexers: 1 to 4 & 1 to 8.	
	3.3	Realization of Boolean expression using multiplexers and demultiplexers.	
	3.4	Sequential circuits: Flip Flops: RS latch, clocked RS, D, JK, T and Master slave	

4	**Module IV**		**10**
	4.1	4.1 Counters: Ripple Binary counter, up counter, down counter	
	4.2	Shift registers: SISO, SIPO, PISO, PIPO shift registers	
	4.3	Ring counter, Johnsons counter	
	4.4	Design for random sequence generator	
5	**Teacher Specific Module**		**5**
	Directions: Teacher can design this module based on their expertise and demand from the students		

Space to fill the selected area/ activity

Essential Readings:

11. 1. Thomas L Floyd, Digital Fundamentals, Pearson, 2011.

2. Anandkumar, Fundamentals of digital circuits, PHI, 2012.

Suggested Readings:

1. John MYarbrough, Digital logic- Application and Design, Thomson Learning,2006.

2. John Wakerly, Digital Design Principles and Practice, Pearson,4/e, 2012

3. Morris Mano,Ciletti, Digital Design, 4/e, Pearson ,4/e, 200

4. Thomas A.DeMessa, Zack Ciecone: Digital Integrated Ciruits, Wiley India,200

5. Ghoshal, Digital Electronics, Cengage, 2012

6. Malvino& Leach, Digital principles and applications, TMH.

LAB EXPERIMENTS

1. Realization of basic gates using NAND gate
2. Realization of basic gates using NOR gate
3. Realize Half adder
4. Realize Full adder
5. Realize Halfsubtractor
6. Realize Full Subtractor
7. Realize 2 X 1 and 4 X 1 Multiplexers using logic gates
8. Realize SR, JK and D flipflop using NAND gate
9. Setup a partity checker
10. Setup a Digital circuit for water level controller

Each laboratory experiment should be accompanied by a detailed lab note containing theoretical background, experimental procedures, circuit diagrams, program listings, and expected outcomes.

ASSESSMENT RUBRICS

	Marks
End Semester Evaluation	**65**
Continuous Evaluation	**35**

KU2MDCELE117: R and Python for Data Analysis

Semester	Course Type	Course Level	Course Code	Credits (L+T+P)	Total Hours (L+T+P)
2	MDC	100	KU2MDCELE117	2+0+1	30+0+30

Learning Approach (Hours/ Week)			Marks Distribution			Duration of ESE (Hours)
Lecture	Practical	Tutorial	CE	ESE	Total	
2	2	0	25	50	75	1.5Hr

Course Description:

This course offers a comprehensive introduction to two of the most widely used programming languages in data analysis: Python and R. Participants will learn the fundamentals of both languages and will explore data visualization techniques. The course will also cover statistical analysis topics such as probability distributions and hypothesis testing using both Python and R. By the end of this course, participants will have the skills and confidence to analyze and visualize data effectively using Python and R, making them valuable assets in the rapidly growing field of data analytics.

Course Prerequisite: Basic knowledge of programming concepts is helpful but not mandatory.