

Course Code	UK2MDCCSC103				
Course Title	DIGITAL LOGIC SYSTEMS				
Type of Course	MDC				
Semester	II				
Academic Level	1				
Course Details	Credit	Lecture per week	Tutorial per week	Practical per week	Total Hours/Week
	3	2 hours	-	2 hours	4 hours
Pre-requisites	Knowledge of basic mathematics is desirable				
Course Summary	Course provides a comprehensive understanding of digital logic, covering various number systems, Boolean algebra, logic gates, combinational and sequential logic circuits.				

Detailed Syllabus:

Module	Unit	Content	Hrs (L+P)
I	Data Representation		12
	1	Concept of number systems– Binary, decimal, Octal, Hexadecimal and BCD	
	2	1's and 2's complement of binary numbers	
	3	Binary arithmetic operations: Addition, Subtraction, Multiplication	
II	Boolean Algebra		12
	4	Basic Laws of Boolean Algebra	
	5	Logic Gates - OR, AND, NOT, NOR, NAND, XOR, XNOR, Universal gates	
	6	Realising Boolean Functions: Min-terms, Max-terms, SOP and POS Expressions, De-Morgan's theorem, simplification of Boolean expression, Karnaugh maps.	

III	Sequential Logic Circuits		12
	7	Introduction to sequential and combinational circuits	
	8	2- bit synchronous counters and 2-bit asynchronous counters	
	9	Flip flops — SR Flip Flop, JK Flip Flop, D Flip Flop, T Flip Flop	
IV	Combinational Logic Circuits		12
	10	Arithmetic Circuits: Half adder, Full adder	
	11	2 -4 Decoder, Encoder	
	12	Multiplexer and Demultiplexer	
V	Flexi Module : Not included for End-Semester Exams		12
	13	Shift Registers-SI-SO, SI-PO, PI-SO, PI-PO	
	14	Seminar / Discussion- Applications of Digital Electronics in day today life	

References

1. Thomas L. Floyd, Digital Fundamentals, 11th edition, Publisher: Pearson,
2. Navas K. and Sam Jose, Digital Electronics Lab Manual, Publisher: Unknown,
3. M Morris Mano, Digital Logic and Computer Design, Publisher: Pearson, Publication Year: 2013
4. D.A. Godse, A.P. Godse, Digital Electronics.
5. R. P. Jain, Digital Electronics.
6. B L Theraja, Basic Electronics, Publisher: Chand Publications.
7. V K Mehta, Rohit Mehta, Principles of Electronics, 12th edition, Publisher: S. Chand & Company.

Web Resources

1. https://www.nutsvolts.com/magazine/article/April2016_Beginner-Guide-to-Digital-Electronics

Lab Exercises

1. Truth table verification of basic gates.
2. Realization of Boolean functions.
3. Verify the NAND and NOR gates as universal logic gates.
4. Verify the truth table of a J-K flip-flop.
5. Test an S-R flip-flop using XNOR/NAND gates.
6. Verify the truth tables of Half and Full adder circuits.
7. Construct 2X1 MUX.
8. Verify the truth table of a 2-4 decoder.

Course Outcomes

No.	Upon completion of the course the graduate will be able to	Cognitive Level	PSO addressed
CO-1	Summarize the concepts of number systems and digital logic.	U	PSO-1, 3
CO-2	Illustrate the basic laws of Boolean algebra and concepts of logic circuits.	Ap	PSO-1,2, 3
CO-3	Develop sequential circuits, such as counters and flip-flops.	Ap	PSO-1,2, 3
CO-4	Design various combinational logic circuits.	Ap	PSO-1,2, 3

R-Remember, U-Understand, Ap-Apply, An-Analyse, E-Evaluate, C-Create

Note: 1 or 2 COs/module

Name of the Course: DIGITAL LOGIC SYSTEMS

Credits: 2:0:1 (Lecture: Tutorial: Practical)

CO No.	CO	PO/PSO	Cognitive Level	Knowledge Category	Lecture (L)/ Tutorial (T)	Practical (P)
CO-1	Summarise the	PO -6,7	U	F, C, P	L	P

	concepts of number systems and digital logic.	PSO-1, 3				
CO-2	Illustrate the basic laws of Boolean algebra and concepts of logic circuits	PO-1, 2, 6,7 PSO-1,2, 3	Ap	F, C, P	L	P
CO-3	Develop sequential circuits, such as counters and flip-flops.	PO-1, 2, 5, 6,7 PSO-1,2, 3	Ap	F, C, P	L	P
CO-4	Design various combinational logic circuits and apply it	PO - 1, 2, 5, 6,7 PSO-1,2, 3	Ap	F, C, P	L	P

F-Factual, C- Conceptual, P-Procedural, M-Metacognitive

Mapping of COs with PSOs and POs :

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO 1	PSO 2	PSO 3	PSO4
CO 1	-	-	-	-	-	1	1	-	2	-	2	-
CO 2	2	2	-	-	-	1	1	-	2	2	2	-
CO 3	1	1	-	-	2	2	2	-	2	1	2	-
CO 4	1	1	-	-	2	2	2	-	2	1	2	-

Correlation Levels:

Level	Correlation
-	Nil
1	Slightly / Low
2	Moderate / Medium
3	Substantial / High

Assessment Rubrics:

- Quiz / Assignment/ Quiz/ Discussion / Seminar
- Midterm Exam
- Programming Assignments
- Final Exam

Mapping of COs to Assessment Rubrics :

	Internal Exam	Assignment	Seminar	End Semester Examinations
CO 1	✓	✓		✓
CO 2				✓
CO 3	✓		✓	✓
CO 4		✓	✓	✓

15. DATA SCIENCE USING PYTHON

Discipline	COMPUTER SCIENCE
Course Code	UK2MDCCSC104
Course Title	DATA SCIENCE USING PYTHON