

Branch Name:	Information Technology
Program Code:	ET105
Course Title:	Digital Fundamentals Practical
Course Code:	2ET1050301P
Pre-requisite Course:	Set Theory, Mathematical relationships, simple file records concept

Course Objective:

1. Student can understand the used and working of digital logics family.
2. Students can understand the concept of K-map and demonstrate unis gates
3. The students need to know combinational and sequential circuits using digital logic fundamentals.
4. The students need to know memory design, terminology of digital IC circuits etc.

Teaching and Examination Scheme:

Credit	Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)								
					Theory (Marks)				Practical (Marks)				Total (Marks)
	L	T	P	Total	SEE		CCA		SEE		CCA		
					Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
1	-	-	2	2	—	—	—	—	10	25	10	25	50

Course Contents:

Sr.No	List of Experiment	Contact Hour
1.	Investigate logic behaviour of AND, OR, NAND, NOR, EX-OR, EX-NOR, Invert and Buffer gates.	2
2.	Verify the NAND and NOR gates as universal logic gates.	1
3.	To verify (a) Demorgan's Theorem for 2 variables (b) The sum-of product and product-of-sum expressions using universal gates	2
4.	Verify the truth table of a J-K and D flip-flop	2
5.	To verify the operation of Multiplexer & De-multiplexer.	1
6.	Design and verification of the truth tables of Half and Full adder circuits.	1
7.	Design and verification of decoder and encoder using logics Gates.	1
8.	Design, and verify the all types of Shift Registers.	1
9.	Case Study: Application of digital electronics	1
10.	Mini Project	3

Reference Books:

1. "Digital logic and Computer design", M. M. Mano, Pearson Education India, 2016.
2. "Fundamentals of Digital Circuits", A. Kumar, Prentice Hall India, 2016.
3. "Digital Principles and Applications" Malvino & Leach, McGraw-Hill Education
4. "Modern Digital Electronics", R. P. Jain, McGraw Hill Education, 2009.

List of Open-Source Software/learning website:

1. LogiSim software
2. <https://circuitverse.org/simulator>
3. <https://www.circuitlab.com/>
4. <https://simulator.io/>
5. <https://everycircuit.com/>
6. <https://simulation.iitbx.in/>
7. <http://vlabs.iitkgp.ac.in/dec/>

Course Learning Outcomes (CLO):

Course Outcomes	Description	Bloom's Taxonomy Level
CO1	Demonstrate the truth table different logic gates and universal gates.	Understand (2) Apply (3)
CO2	Demonstrate the truth table of various expressions and combinational circuits using logic gates.	Understand (2) Apply (3)
CO3	Design, test and evaluate various combinational circuits such as adders, subtractors, comparators, multiplexers and demultiplexers	Understand (2) Apply (3)
CO4	Construct flips-flops, counters and shift registers.	Understand (2) Apply (3)
CO5	Simulate full adder and up/down counters.	Understand (2) Apply (3)

Mapping of CLO with PO and PSO

Course Learning Outcomes	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	M	M	L			H							L	L	
CO2	M	M	L			H							L	L	
CO3	M	M	L			H							L	L	
CO4	M	M	L			H							L		
CO5	M	M	L			H				H	M		L		