

Branch Name:	Computer Engineering / Information and Communication Technology / Artificial Intelligence and Data Science
Program Code:	ET103 / ET107 / ET108
Course Title:	Digital Electronics Practical
Course Code:	2ET1030301P
Pre-requisite Course:	Set Theory, Mathematical relationships, simple file records concept

Course Objective:

1. The students need to know combinational and sequential circuits using digital logic fundamentals.
2. The students need to know (combinational/sequential devices), 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.	To study & design basic gates.	2
2.	Verify the NAND and NOR gates as universal logic gates.	1
3.	To realize and minimize five & six variables using K-Map method.	1
4.	To verify the operation of Multiplexer & De-multiplexer.	2
5.	Design and verification of the truth tables of Half and Full adder circuits.	1
6.	Design and test of an S-R flip-flop using NOR/NAND gates.	2
7.	Verify the truth table of a J-K flip-Flop	1
8.	Verify the truth table of a D flip-flop	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	Understand number systems and its conversion; simplify Boolean expressions by different methods and study and implementation using logic gates.	Understand (L1) Apply (2), Analyse (4)
CO2	Apply the Boolean algebra knowledge of mathematics to analyze combinational and sequential digital electronic circuits using K-map and QM technique.	Understand (L1) Apply (2), Analyse (4)
CO3	Design combinational and sequential circuits for the given specifications/constraints.	Understand (L1) Apply (2) , Analyse (4)
CO4	Compare the characteristics of logic families for implementing combinational & sequential circuits.	Understand (L1) Apply (2) , Analyse (4)
CO5	Demonstrate applications of digital circuits.	Understand (L1) Apply (2) , Analyse (4)

Mapping of CLO with PO and PSO

[illegible]