LABORATORY HANDOUT

DIGITAL ELECTRONICS LAB (ESC-312)

ECE-3RD SEMESTER

ACADEMIC YEAR (2024-25)

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Course Code	Course Name	Course Type	Cd	L	T	P	Marks		
							Sessional	Final Exam	Total
ESC-312	Digital Electronics Lab	PCC	2	0	0	4	50	-	50

COURSE OUTCOMES

At the end of the course the student will be able to:	
CO1	Implement and verify Boolean expressions using Logic Gates
CO2	Verify the truth table from a description for a combinational logic function.
CO3	Create a gate-level implementation of a combinational logic function.
CO4	Design and implement various sequential circuits using digital ICs.
CO5	Learn the formal procedures for the analysis and design of combinational and sequential circuits.

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1	1	3	3	-	-	-	-	-	-	-	-	-	2	2
2	1	3	3	-	3	-	-	-	1	-	1	3	1	2
3	1	3	3	2	3	2	-	-	2	-	1	3	3	2
4	1	3	3	3	3	-	-	-	-	-	1	1	2	2
5	1	3	3	3	3	-	-	2	1	-	2	-	2	1

LIST OF EXPERIMENTS

S.No.	Title
1	Implement and verify the truth table of logic gates using Logisim and Digital Kit.
2	Implement and verify the truth table of logic gates using Breadboard.
3	Analyze universal gates using simulation.
4	Implement equivalence of various Boolean expressions using Logisim and Digital Kit.
5	Implement and verify truth tables of Adder and Subtractor.
6	Implement and verify the truth table of MUX using NAND.
7	Implement and verify the truth table DEMUX using NAND.
8	Implement and verify truth tables of BCD-7 Segment Display.
9	Implement and verify truth table of Flip-Flops.
10	Design Ring counter/ Johnson counter.
11	Design Ring up/ down counter.
12	Design and verify truth table Parity Encode.
13	Design of 4.bit Comparator
14	Implement and verify truth table of one bit comparators using logic gates.

ADDITIONAL WEB RESOURCES

1.	VLAB LINK: Digital electronics by IIT Roorkee which gives hands-on experience to the students. https://de-iitr.vlabs.ac.in/List%20of%20experiments.html
2.	VLAB LINK: Digital electronics by IIT Kgp which gives hands-on experience to the students http://vlabs.iitkgp.ernet.in/dec/#
3.	VLAB LINK: Digital electronics by IIIT Hyderabad which gives hands-on experience to the students. http://cse15-iiith.vlabs.ac.in/
4.	VLAB LINK: Digital electronics by IIT Guwahati which gives hands-on experience to the students. https://www.iitg.ac.in/cseweb/vlab/Digital-System-Lab/experiments.php

LAB REPORT INSTRUCTIONS

- Provide specific title of the lab experiment.
- Theory: Provide a concise abstract (typically 100-200 words) that summarizes the purpose, methods, key findings, and significance of the experiment.
- Materials/ Equipment: List all materials, components, and equipment used in the experiment. Include specifications when applicable.
- Software/Simulation Tools:
- Experimental Procedure: Describe the step-by-step procedure for conducting the experiment. Be detailed and clear in your instructions. Include diagrams or schematics to illustrate the setup, connections, and component placement. Explain any variations or adjustments made to the standard procedure.
- Observation & Calculations/Analysis: Detail the data you collected during the experiment. Include descriptions of measurements and any calculations made. Use tables, charts, or graphs to present data clearly. Discuss any trends, patterns, or significant observations. Interpret the data in the context of the experiment's objectives. Ensure that all figures, tables, and equations are correctly labeled.
- Results: Summarize the key findings of the experiment. Present results in a clear and organized manner using tables and graphs. Include units of measurement and labels for data points.
- Conclusion: Provide a concise summary of the experiment's key points and outcomes.

GRADING AND ASSESSMENT

- **Continuous Evaluation**: 30 marks
- **Final Demo & Viva**: 10 marks
- **Attendance**: 10 marks
- **Lab Overall Marks**: 50 marks

COURSE POLICIES

- **Attendance**: Minimum 75% attendance is mandatory to appear in the final examination of the course.
- **Late Submissions**: Manuals and projects must be submitted by the specified timelines.

FACULTY INFORMATION

- **Office Hours**
  Monday (12:05 PM - 12:55 PM)
  Friday (12:05 PM - 12:55 PM)
- **Contact Information**
  sarabdeep.ece@mietjammu.in

RUBRICS FOR LAB CONTINUOUS EVALUATION

Parameters	Performance			
	Low	**Medium**	**High**	**Marks**
Execution of the Experiment	Student was not able to setup and conduct the Experiment completely	Student was able to setup and conduct the experiment but measurement/results/observations were not correct	Students was able to set and conduct the experiment and the measurement/results/observations were not correct	10
	0-2 Marks	3-6 Marks	7-10 Marks	
Record	Student was not able to describe the detailed procedure and could not record the measurement.	Student was able to describe the detailed procedure partially or with some inaccuracy.	Student was able to describe the detailed procedure accurately and record all measurements correctly.	10
	0-2 Marks	3-6 Marks	7-10 Marks	
Viva Voice	Students could not demonstrate sufficient knowledge of foundation, functional or applied aspects related to the experiment during viva.	Students demonstrated sufficient knowledge of foundation, functional or applied aspects related to the experiment during viva.	Students demonstrate strong knowledge of foundation, functional or applied aspects related to the experiment during viva	10
	0-2 Marks	**3-6 Marks**	**7-10 Marks**	
Total Marks				**30**