

Department /Institute Name Department of Electronics & Electrical Engineering/ Chitkara University
Institute of Engineering & Technology

Program Name B.E.(Computer Science and Engineering)

Course Code ECP1207

Course Name Digital Electronics & Logic Design Lab

Labs (per week) 2-0-0 **Course Credits** 1

Course Coordinator Name Ms. Meenu Garg

1. Scope and Objectives of the Course

- To understand the digital logic and create various systems by using these logics.
- To develop an understanding of design and simulation of digital logic circuits.
- To get a basic understanding of layout of electronic circuits.
- We will use Tanner tools for design and simulation.
- This lab introduces students to Tanner tools.

2. Recommended Book

Lab Manual prepared by faculty of ECE Deptt.

3. Other readings and relevant websites

S.No.	Link of Journals, Magazines, websites and Research Papers
1.	http://www.electronics-lab.com/
2.	http://www.quasarelectronics.com/maxitronix/epl500-500-in-1-electronic-project-lab-mx-909.htm

4. Lab Plan

S. No.	Experiment Detail
1	Logic gate is a basic building block of a digital circuit. So verify the truth tables of all the logic gates on trainer kit using TTL ICs. Also verify them using multisim.
2	Mr. Vivek wants to add two numbers in computer but computer only understands the binary numbers i.e. 0&1. So design a circuit that adds binary equivalent of two decimal numbers.
3	Suppose there are two binary numbers as input and subtract one binary number input from other binary number input. Design the circuit using universal gates.
Post Lab Assignment:	
<ul style="list-style-type: none"> • To build and test a 1-bit half-adder • To build and test a 1-bit full-adder • To test an integrated (pre-built) 4-bit full-adder 	
4	Considering two numbers (each two bit), Design a circuit which produces the output that compares whether the number is greater than, less than or equal to the second number.
5	i) Suppose one input is to be selected from n inputs. Implement the circuit using IC 74150.

	ii) A circuit distributes one input into n output lines. Design the circuit using IC 74154.
6	A code represents each number in the sequence of integers $\{0 \dots 2^N - 1\}$ as a binary string of length N in an order such that adjacent integers have code representations that differ in only one bit position. Design a convertor that has above property.
Post Lab Assignment:	
<ul style="list-style-type: none"> • Design and implement a combinational circuit that converts 4-bit binary code into 4-bit excess-3 code. • Design and implement a combinational circuit that converts 4-bit binary code into 4-bit gray code. • To design and analyze TTL based circuit on breadboard for universal gates . 	
7	In How many ways one bit of information can be stored in computers. Design and verify at least three different methods using sequential logic circuits.
8	In digital logic and computing, a counter is a device which stores the number of times a particular event or process has occurred in relationship to a clock signal. <ul style="list-style-type: none"> i) Design such a counter which uses a circulating shift register in which last flip flop shifts its value into the first flip flop. ii) Also design a counter in which the inverted output of the last flip flop is connected to the input of first flip flop.
9	Suppose there is a need to store 4 bit of data. Which device is required for this purpose also show the transfer of data in SISO, SIPO , PISO and PIPO forms.
10	Implement a circuit and verify its operation that requires power-supply, inputs (push buttons/DIP switches) and outputs (LED/7-segment display).
Post Lab Assignment:	
<ul style="list-style-type: none"> • Design a circuit to implement Christmas Lights Sequencer • Design and implement asynchronous counter can be implemented having a modulus of 12 with a straight binary sequence from 0000 through 1011 	

5. Evaluation Scheme:

Component 1*	Lab Performance	40
Component 2	Internal Viva	20
Component 3**	External Viva	40
	Total	100

*Lab Performance will be evaluated periodically.

**The End Term examination for practical courses is held at the end of semester and includes conduct of experiment and an oral examination (viva voce).The mandatory requirement of 75% attendance in all lab classes is to be met for being eligible to appear in this component

6. Details of Evaluation Component 1 and Component

Description	Marks	To be held in week	Remarks
Lab Performance 1	20	4 th – 5 th week	Program/Experiment + Viva
Lab Performance 2	20	8 th -9 th week	Program/Experiment + Viva
Internal Viva	20	14 th week	Internal Viva

This document is approved by

Designation	Name	Signature
Course Coordinator	Ms. Meenu Garg	
Program Incharge	Mr. Gurjinder singh	
Deputy Dean	Ms. Shivani Malhotra	
Date	December26, 2017	