ECE216:DIGITAL ELECTRONICS LABORATORY

L:0   T:0   P:2   Credits:1

Course Outcomes: Through this course students should be able to

CO1 :: Describe the design and functionality of digital circuits.

CO2 :: Analyze the digital circuits and compare its theoretical performace to actual performance.

CO3 :: Analyze functionality of the digital trainer kit to verify basic logic truth table.

List of Practicals / Experiments:

Analysis and Synthesis of Boolean Expressions using Basic Logic Gates
- Understanding the combinational logic by implementing the boolean function using basic logic gates

Analysis and Synthesis of Arithmetic Expressions using Adders/Subtractors
- To design and analyze the circuit for Full adder and Full subtractor using Logic Gates.

Analysis and Synthesis of Logic Functions using Multiplexers and decoders
- Understanding the combinational logic byimplementing the boolean function usingmultiplexer
- Understanding the combinational logic byimplementing the boolean function usingDecoder

Analysis and Synthesis of Sequential Circuits using Flip-Flops
- Understanding the sequentianal logic byimplementing the flip flop with the helpof logic gates
- Understanding the sequentianal logic byimplementing the counter with flip flop.

Analysis of Functions of BCD-TO-7-segment Decoder / Driver and Operation of 7-segment LED Display
- To visualize the output of decade counter on seven segment display

Design and implementation of combinational and sequential circuit using Software
- To implement and simulate combinational and sequential circuit using DSCH/Proteus.

Design and Implementation of application based projects, any two to be implemented
- To design 4 bit digital calculator which can perform addition and multiplication and display using 7 segment.
- To design a circuit which can generate random number and display using 7 segment.
- To design a circuit for smart home automation.
- To design a circuit for secure locking mechanism.
- To design a circuit for global positioning system synchronize clock.
- To design a system for solar tracking.
- To design a up and down fading lights (different colored LEDs) with specified delays usingflipflops/counters
- Design a universal counter which can perform different shift operations using multiplexer.
- Design a digital calculator which can implement subtraction and division functions, and display output in 7-segment display unit

Text Books: 1. DIGITAL DESIGN PRINCIPLES AND PRACTICES by JOHN F. WAKERLY, PEARSON

References: 1. DIGITAL FUNDAMENTALS by THOMAS L. FLOYD , R. P JAIN, PEARSON

2. DIGITAL ELECTRONICS PRINCIPLES AND INTEGRATED CIRCUITS by ANIL K MAINI, PEARSON

3. DIGITAL INTEGRATED ELECTRONICS by H. TAUB AND D. SCHILLING, MCGRAW HILL EDUCATION

4. DIGITAL ELECTRONICS- A COMPREHENSIVE LAB MANUAL by CHERRY BHARGAVA, BS PUBLICATIONS