CSE1003
Digital Logic and Design

G1+TG1 slot

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What is this course about?

4 Credit course

3 Lecture + 1 Practical

Course Objectives

1. Introduce the concept of digital and binary systems

2. Design and analyze combinational logic circuits.

3. Design and analyze sequential logic circuits.

4. Design functional blocks of a digital system.

5. Reinforce theory and techniques taught in the classroom through experiments in the laboratory.

Expected Course Outcome

- CO1: Comprehend the different types of number systems.
- CO2: Evaluate and simplify logic functions using Boolean Algebra and K-map
- CO3: Design minimal combinational logic circuits.
- CO4: Analyze the operation of medium complexity standard combinational circuits like the encoder, decoder, multiplexer, demultiplexer.
- CO5:Familiar with basic sequential components and analyze and design the FSM
- CO6: Design different types of registers and counters using flip flops
- CO7:Design Arithmetic and Logic Circuits

Module 1 Introduction 3 hours

- Number System - Base Conversion- Binary Codes – Complements (Binary and Decimal)

Module 2
BOOLEAN ALGEBRA 8 hrs

- Boolean algebra
- Properties of Boolean algebra
- Boolean functions
- Canonical and Standard forms
- Logic gates - Universal gates
- Karnaugh map - Don’t care conditions
- Tabulation Method

Module 3
COMBINATIONAL CIRCUIT – I

- Adder
- Subtractor
- Code Converter
- Analyzing a Combinational Circuit

Module 4
COMBINATIONAL CIRCUIT –II

- Binary Parallel Adder
- Look ahead carry
- Magnitude Comparator
- Decoders
- Encoders
- Multiplexers
- Demultiplexers

Module 5
SEQUENTIAL CIRCUITS – I

- Flip Flops
- Sequential Circuit: Design and Analysis
- Finite State Machine: Moore and Mealy model
- Sequence Detector

Module 6

SEQUENTIAL CIRCUITS – II

- Registers
- Shift Registers
- Counters
- Ripple and Synchronous Counters
- Modulo counters - Ring and Johnson counters

Module 7

ARITHMETIC LOGIC UNIT

- Bus Organization
- ALU-Design of ALU
- Status Register
- Design of Shifter
- Processor Unit
- Design of specific Arithmetic Circuits
- Accumulator
- Design of Accumulator

Module 8

Contemporary issues:Lecture by industry experts

Module	No. of. Hours
1	3
2	8
3	4
4	6
5	6
6	7
7	9
8	2
Total	45

Text Book

- M. Morris Mano – Digital Logic and Computer Design, Pearson Education India – 1st Edition-2016, ISBN: 9789332542525

Reference Books

1. A.P. Malvino, D.P. Leach and GoutamSaha – Digital Principles and Applications(SIE) – Tata McGraw Hill 8th Edition – 2014, ISBN: 9789339203405.

2. M. Morris Mano and Michael D.Ciletti– Digital Design: With an introduction to Verilog HDL – Pearson Education – 5th Edition- 2014. ISBN:9789332535763

3. Thomas Floyd – Digital Fundamentals – Pearson Education-10th Edition – 2011, ISBN: 9788131734483.

Mode of Evaluation

- CAT I and CAT II :30
- Digital Assignment I :10
- Digital Assignment II :10
- Digital Quiz (Class activity):10
- FAT : 40
- Total : 100

Thank you