BCS-11 DIGITAL CIRCUITS AND LOGIC DESIGN

Course Category	:	Engineering Fundamental (EF)
Pre-requisite Subject	:	NIL
Contact Hours/Week	:	Lecture : 3, Tutorial : 1 , Practical: 0
Number of Credits	:	4
Course Assessment Methods	:	Continuous assessment through tutorials, attendance, home assignments, quizzes and Three Minor tests and One Major Theory Examination
Course Outcomes	:	The students are expected to be able to demonstrate the following knowledge, skills and attitudes after completing this course

1. Design a finite state machine and sequential logic design.
2. Synthesize a logic design from a natural language description of a problem.
3. Realize a complete arithmetic and logic unit.
4. Generate a realization of combinational logic in a programmable gate array.
5. Simulate a complete design to evaluate functional correctness and timing.

Topics Covered

UNIT-I

Binary Codes - Weighted and Non-Weighted - Binary Arithmetic Conversion Algorithms - Error Detecting and Error Correcting Codes - Canonical and Standard Boolean Expressions - Truth Tables. 9

UNIT-II

K-Map Reduction - Don't Care Conditions - Adders / Subtractors- Carry Look-Ahead Adder - Code Conversion Algorithms - Design of Code Converters - Equivalence Functions. 9

Binary/Decimal Parallel Adder/Subtractor for Signed Numbers - Magnitude Comparator - Decoders / Encoders - Multiplexers / Demultiplexers- Boolean Function Implementation using Multiplexers.

UNIT-III

Sequential Logic - Basic Latch - Flip-Flops (SR, D, JK, T and Master-Slave) - Triggering of Flip-Flops - Counters - Design Procedure - Ripple Counters - BCD and Binary - Synchronous Counters. 9

UNIT-IV

Registers - Shift Registers - Registers with Parallel Load - Memory Unit - Examples of RAM, ROM, PROM, EPROM - Reduction of State and Flow Tables - Race-Free State Assignment - Hazards. 9

Textbooks

1. Morris Mano, Digital Design, Prentice Hall of India, 2001
2. Raj Kamal, Digital Systems Principles and Design, Pearson Education, First Edition, 2007

3. Charles H. Roth, Jr. and Larry L. Kinney, Fundamentals of Logic Design, CL Engineering, Seventh Edition, 2013.

Reference books

1. W. H. Gothmann, Digital Electronics -An Introduction to Theory and Practice, Prentice Hall of India, 2000
2. Donald D. Givone, Digital Principles and Design, Tata McGraw –Hill, Thirteenth Impression, 2003.

BCS-12 PRINCIPLES OF DATA STRUCTURES THROUGH C/C++

Course Category	:	Department Core (DC)
Pre-requisite Subject	:	NIL
Contact Hours/Week	:	Lecture : 3, Tutorial : 1 , Practical: 2
Number of Credits	:	5
Course Assessment Methods	:	Continuous assessment through tutorials, attendance, home assignments, quizzes, practical work, record, viva voce and Three Minor tests and One Major Theory & Practical Examination
Course Outcomes	:	The students are expected to be able to demonstrate the following knowledge, skills and attitudes after completing this course

1. Describe how arrays, records, linked lists, stacks, queues, trees, and graphs are represented in memory, used by the algorithms and their common applications.
2. Write programs that use arrays, records, linked structures, stacks, queues, trees, and graphs.
3. Compare and contrast the benefits of dynamic and static data structures implementations.
4. Identity the alternative implementations of data structures with respect to its performance to solve a real world problem.
5. Demonstrate organization of information using Trees and Graphs and also to perform different operations on these data structures.
6. Design and implement an appropriate organization of data on primary and secondary memories for efficient its efficient retrieval. .
7. Discuss the computational efficiency of the principal algorithms for sorting, searching and hashing.
8. Describe the concept of recursion, its application, its implementation and removal of recursion.

Topics Covered