Computer Practical
Practical on Data Structures and Algorithms I and Software Engineering
[CORE COURSE]

Semester – III	Credits: 2	Subject Code: BSP32108	Lectures: 48

Course Outcomes:

At the end of this course, the learner will be able to:
- Illustrate different methods of organizing the large amount of data
- Summarize well-organized data structures in solving various problems
- Compare and contrast the usage of various data structures in problem solving
- Demonstrate algorithms to solve problems using appropriate data structures

Section 1: Data Structures and Algorithms I	28

- **Assignment1:Searching Algorithms**
  - Implementation of searching algorithms to search an element using: Linear Search, Sentinel Search, Binary Search (with time complexity)
- **Assignment 2:Sorting Algorithms -I**
  - Implementation of sorting algorithms: Bubble Sort, Insertion Sort, Selection Sort
- **Assignment 3:Sorting Algorithms -II**
  - Implementation of sorting algorithms: Quick Sort, Merge Sort , Counting Sort
- **Assignment 4:Singly Linked List**
  - Dynamic implementation of Singly Linked List to perform following operations: Create, Insert, Delete, Display, Search, Reverse
  - Create a list in the sorted order.
- **Assignment 5:Doubly Linked List**
  - Dynamic implementation of Doubly circular Linked List to perform following operations: Create, Insert, Delete, Display, Search
- **Assignment 6:Linked List Applications1**
  - Merge two sorted lists. Addition of two polynomials in a single variable.
- **Assignment 7:Stack**
  - Static and Dynamic implementation of Stack to perform following operations: Init, Push, Pop, Peek, Isempty, Isfull
- **Assignment 8:Applications of Stack**
  - Implementation of an algorithm that reverses string of characters using stack and checks whether a string is a palindrome.
  - Infix to Postfix conversion.
  - Evaluation of postfix expression.
- **Assignment 9:Linear Queue**
  - Static and Dynamic implementation of linear Queue to perform following operations: Init, enqueue, dequeue Peek, IsEmpty, IsFull.

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Section 2: Assignments for Software Engineering mini Project	8
• Prepare detailed statement of problem for the selected mini project • Identify suitable process model for the same. • Develop Software Requirement Specification for the project. • Identify scenarios and develop UML Use case • Other artifacts: Class Diagram, activity diagram, sequence diagram, component diagram and any other diagrams as applicable to the project	

*Contact Hours: 36+ 12

Recommended Books:	
• Debasis S.(2009).*Classic Data Structures* . Prentice Hall India Pvt. Ltd. • Horowitz E., Sahni S.,Anderson-Freed s. (2008).*Fundamentals of Data Structures in C* . Universities Press. • Kamthane A.N.(2009). *Introduction to Data Structures in C*.Pearson Education. • Wirth N. (1976).*Algorithms and Data Structures*. Pearson Education.	

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