



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

<b>Semester – III</b>	<b>Credits: 2</b>	<b>Subject Code: BSP32108</b>	<b>Lectures: 48</b>
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**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**

- **Assignment 1: 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 Applications 1**
  - 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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<b>Section 2: Assignments for Software Engineering mini Project</b>	<b>8</b>
<ul style="list-style-type: none"> <li>• Prepare detailed statement of problem for the selected mini project</li> <li>• Identify suitable process model for the same.</li> <li>• Develop Software Requirement Specification for the project.</li> <li>• Identify scenarios and develop UML Use case</li> <li>• Other artifacts: Class Diagram, activity diagram, sequence diagram, component diagram and any other diagrams as applicable to the project</li> </ul>	

**\*Contact Hours: 36+ 12**

<b>Recommended Books:</b>	
<ul style="list-style-type: none"> <li>• Debasis S.(2009).<i>Classic Data Structures</i> . Prentice Hall India Pvt. Ltd.</li> <li>• Horowitz E., Sahni S.,Anderson-Freed s. (2008).<i>Fundamentals of Data Structures in C</i> . Universities Press.</li> <li>• Kamthane A.N.(2009). <i>Introduction to Data Structures in C</i>.Pearson Education.</li> <li>• Wirth N. (1976).<i>Algorithms and Data Structures</i>. Pearson Education.</li> </ul>	

Board Of Studies	Name	Signature(In white cell)	
Chairman (HoD)	Ms. Ashwini Kulkarni		
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Faculty	Ms.Shubhangi Jagtap		
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