

DEPARTMENT OF COMPUTER SCIENCE
ACADEMIC ACTION PLAN FOR 2012-2013
B.Sc IV SEMESTER(Data Structures using Java)

| Month | Topics to be covered as per syllabus | Topics included other than state level common-core syllabus | Beyond syllabus | General Lectures/ Seminars | Remarks |
|----------|--|--|--|----------------------------|---------|
| December | i) Introduction to data structures ii) Definition of stack and Examples iii) Implementing PUSH and POP operations iv) Converting an expression from infix to postfix vi) Program to convert an expression from infix to postfix.vii) Evaluation of postfix expression | Evaluation of postfix expression | Examples on stacks: Postponed decisions | | |
| January | (i) Queues: Definition of Queue, Operations on Queue - insert Operation - Delete Operation, Queue as an Abstract Data Type, Priority Queue, Array implementation of a Priority Queue. | Priority Queue & Array Implementation | Objective type questions | Seminars | |
| | (ii) Linked Lists: Inserting and Removing Nodes from a List - Linked Implementation of Stacks - getnode and freenode Operations - Linked Implementation of Queues - Examples of List Operations - List Implementation of Priority Queues- Array Implementation of Lists - Limitations of the Array Implementation - Allocations of the Array Implementation - Allocating and Freeing Dynamic Variables. | Priority Queues- Array Implementation of Lists - Limitations of the Array Implementation | Programs for ascending and descending priority queues. | Seminars | |
| | (iii) Linked Lists Using Dynamic Variables: Queues as Lists - Examples of List Operations - Other List Structures - Circular Lists - Stack as a Circular List - Queue as a Circular List - Primitive Operations on Circular List | Circular Lists - Stack as a Circular List - Queue as a Circular List - Primitive Operations on Circular List | | | |

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| February | (i) Binary Trees – Operations on Binary Trees – Applications of Binary Trees – Binary Tree Representations – Node Representation of Binary Trees – Internal and External Nodes – Implicit Array Representation of Binary Trees – Choosing a Binary Tree Representation – Binary Tree Traversals – | | | Seminars | |
| | (ii) Trees and Their Applications: Representation of Trees – Tree Traversals – General Expressions as Trees – Evaluating an Expression Tree – Constructing a Tree. | Trees and Their Applications | | | |
| March | (i) Sorting: – Selection Sort – Insertion Sort – Bubble Sort – Shell Sort - Quick sort – Tree Sorting – Straight Selection Sorts – Binary Tree Sorts – Heap Sort – Heap as a Priority Queue – Sorting Using a Heap – Heap sort Procedure. | Selection Sort – Insertion Sort – Shell Sort – Tree Sorting – Straight Selection Sorts – Binary Tree Sorts – Heap Sort – Heap as a Priority Queue – Sorting Using a Heap – Heap sort Procedure. | Merge sort technique | | |
| | (ii) Searching: Basic Search Technique – Dictionary as an Abstract Data Type – Algorithmic Notation – Sequential Searching – Searching on Ordered table – Binary Search. | Dictionary as an Abstract Data Type – Algorithmic Notation – Sequential Searching – Searching on Ordered table | Program for binary search tree | Seminars | |
| | (iii) Graphs and Their Applications: Graphs – Applications of Graphs – Representation of Graphs – Graph Traversal and Spanning Forests. | | Objective type questions | | |
| April | Traversal Methods for Graphs: Spanning Forests – Undirected Graphs and their Traversals – Depth-first Traversal – Applications of Depth-First traversal – Breadth-First Traversal. | Applications of Depth-First traversal – Breadth-First Traversal | | | |