Course Information

SER 222 Design and Analysis of Data Structures and Algorithms

Catalog Description

Data structures and related algorithms for their specification, complexity analysis, implementation and application. Sorting and searching. Professional responsibilities that are part of program development, documentation and testing.
Credit Hours : 3

Prerequisites by Topic, Course

- CST200 and MAT243

Textbooks and Other Resources


Course Description and Goals

Major Topics Covered

- OO Programming, Compilation Review.
- Collection Classes, Linked Lists.
- Linked Lists (equals, clone), Object Class, Interfaces.
- Iterator Pattern, Iterator Interface, Map Interface, TreeMap Class.
- Running Time Analysis (Big-O).
- Stacks and Queues
- Recursion, Trees, Binary Trees; Traversals, Binary Search Trees.
- Heaps, Priority Queues, Searching.
- Hash Tables.
- Sorting: quadratic, recursive sorts, and heap sort.

Course Coordinator

AnshumanRazdan

Sample Course Activities

Course Outcomes

1. CO1 Students can understand and apply big-O analyses of algorithms. Students can
analyze existing algorithms and use these techniques in designing algorithms.

Student Outcomes Supported
Critical Thinking and Decision Making, Technical Competence

2. CO2 To gain experience in the object-oriented programming paradigm. Students understand elementary data structures as objects and as being composed of objects. Students can design objects using elementary data structures.

Student Outcomes Supported
Design, Technical Competence

3. CO3 To learn and to be able to judge the appropriateness of alternate implementations of elementary data structures. Students understand advantages and disadvantages of sequential implementation vs. linked implementation.

Student Outcomes Supported
Critical Thinking and Decision Making, Technical Competence

4. CO4 To learn specification and application of elementary data structures. Students know commonly used specifications for arrays, stacks, queues, strings, sets, sequential lists, binary search trees and hashed storage.

Student Outcomes Supported
Technical Competence