



## DATA STRUCTURES — ISTC 2050

### A. Course Description

- **Credits:** 3.00
- **Lecture Hours/Week:** 2.00
- **Lab Hours/Week:** 1.00
- **OJT Hours/Week:** 0
- **Prerequisites:**
  - ISTC 1300: Introduction to Programming
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- **Corequisites:** None
- **MnTC Goals:** None

This course introduces the student to the theory, design and implementation of common data structures and related algorithms. Topics include linked lists, recursion, stacks, queues, search algorithms, sorting algorithms, graphs and binary trees. Students will write numerous programs to demonstrate comprehension of the course topics. PREREQUISITE: ISTC 1300

### B. Course Effective Dates: 8/20/07 – Present

### C. Outline of Major Content Areas

As noted on course syllabus

### D. Learning Outcomes

1. verify correctness of a recursive routine by identifying the base case and the general case
2. choose the appropriate data structure for modeling a given problem
3. define array-based lists
4. define binary trees
5. define concepts of various search algorithms
6. define graph theory
7. define hashing
8. define heaps
9. define linked lists
10. define stacks and queues
11. define the divide-and-conquer approach
12. describe and exemplify the concept of recursion

13. describe common applications for each data structure covered
14. describe how recursion can be implemented using a stack
15. implement sort algorithm in a high-level language
16. implement the user-defined data structures in a high-level language
17. implement, test, and debug simple recursive functions
18. write and execute a program for testing a data structure implementation

**E. Minnesota Transfer Curriculum Goal Area(s) and Competencies**

**F. Learner Outcomes Assessment**

As noted on course syllabus

**G. Special Information**

None noted