

# North Hennepin Community College

## CSCI 2002: Data Structures and Algorithms (CS2)

### A. COURSE DESCRIPTION

Credits: 4

Lecture Hours/Week: 0

Lab Hours/Week: 0

OJT Hours/Week: \*.\*

Prerequisites:

This course requires the following prerequisite

CSCI 2001 - Object Oriented Programming (CS1)

Corequisites: None

MnTC Goals: None

This course continues using abstract data types and the concepts presented in CSci 2001 and introduces stacks, queues, linked lists, and trees. This course also covers advanced programming topics of recursion, sorting methods, and complexity measures.

This is an object-oriented programming course.

**B. COURSE EFFECTIVE DATES:** 07/02/2018 - Present

### C. OUTLINE OF MAJOR CONTENT AREAS

1. Topics studied are: Collection classes, linked lists, stacks, queues, trees and hash tables. The course also covers the advanced programming topics of recursive traversal of data structures, sorting methods, and complexity measures

### D. LEARNING OUTCOMES (General)

1. Implement recursive and iterative algorithms over appropriate data structures (e.g., tree traversal, pre-order, and post-order) (ELO# 1,2)
2. Analyze recursive and iterative algorithms for space-time complexity (ELO# 1,2)
3. Identify appropriate use of and implement statically allocated data structures. (ELO# 1,2)
4. Identify appropriate use of and implement dynamically allocated data structures. (ELO# 1,2)
5. Develop and implement a dictionary data type incorporating hashing algorithms and collision avoidance. (ELO# 1,2)
6. Write programs that use each of the following data structures: arrays, records/structs, strings, linked lists, stacks, and queues. (ELO# 1,2)
7. Implement algorithms and underlying data structures utilizing standard object oriented design principles. (ELO# 1,2)

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

None

### F. LEARNER OUTCOMES ASSESSMENT

As noted on course syllabus

### G. SPECIAL INFORMATION

Intellectual and Practical Skills, Including: Inquiry and analysis; Critical and creative thinking; Written and oral communication; Quantitative literacy; Information literacy; Teamwork and problem solving.