

**Course Number:** CSC 313

**Course Title:** Data Structures

**Number of Credits:** 3

**Schedule:** Three hours of lecture/discussion per week.

**Prerequisite:** a grade of C or better in CSC 213 and Math / CSC 330

### **Catalog Description**

This course covers core data structures such as Recursion, Linked Lists, Stacks, Queues, Tables and Priority Queues, Trees, Graphs, Sorting, Hashing, Skip Lists, Sets & Maps. The course also covers the latest features of C++ including expanded use of the Standard Template Library (STL) and enforces data abstraction and its usage in the problem-solving process.

### **Expanded Description**

Introduction to Software Engineering Principles

Abstract Data Types

Recursion

Analysis of Algorithms

Stacks and Queues

Internal Sorting

Trees

Tables and Priority Queues

Hash Tables

Balanced Trees

Skip Lists

Sets and Maps

Graph

### **Course Objectives and Role in Program**

The objectives of this course include:

- Teach fundamental concepts of data structures
- Introduce the student to integrated development environments.
- Expose the student to other software development tools including debuggers and code profilers

Students will develop several small applications with focuses on specific data structures. The knowledge of software development tools and understanding of data structures play an important role in all software development projects students develop for courses in the program.

### **Learning Outcomes**

At the end of this course students will

- Be able to write C++ programs utilizing STL and an integrated development environment
- Utilize a debugger when doing software development

- Apply Data Structures and ADT concepts effectively when developing small to medium sized projects
- Write robust code utilizing exception handling language features
- Learn what and how to document each program project

### **Method of Evaluation**

Student learning will be evaluated on the basis of

- Completeness and quality of programming assignments.
- Completeness and quality of written assignments.
- Grade on midterm and final examination.

The weight assigned to each element of evaluation will be determined by the instructor of the course on the first day of the class.

### **Required Textbooks**

Data Abstraction and Problem Solving with C++, 4th Edition, by Frank Carrano, Addison Wesley 2005

### **Recommended Reference**

1. Any C++ programming language book
2. Data Structures and Programming Design in C++, by Kruse and Ryba, Prentice Hall 1999
3. Data Structures with C++ using STL, 2nd Edition, by Ford & Topp, Prentice Hall 2002

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