



Course Data Structures (2014-2015)

Code / Version PROG1370 (102)

Total Hours 60

Credits 4

PreRequisite(s) PROG1345 (100) C Programming
or PROG1347 (100) C Programming

CoRequisite(s) PROG1385 (100) Object-oriented Programming

Course Description

This course will emphasize software development using data efficiently and effectively. Important advanced data structures will be discussed and implemented. Common algorithms will be discussed. The C++ Standard Template Library will be introduced.

PLAR Eligible: Yes

Course Outcomes

Successful completion of this course will enable the student to:

1. Explain why data structures are important to software development.
 2. Implement the basic linked list object.
 3. Implement more advanced linked lists.
 4. Implement queues and stacks.
 5. Implement circular data structures.
 6. Use tree structures.
 7. Implement hash tables.
 8. Evaluate the efficiency of an algorithm.
 9. Use common algorithms to enhance software development.
 10. Use the C++ Standard Template Library to facilitate the storage of data.
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Unit Outcomes

Successful completion of the following units will enable the student to:

- 1.0 Data Structure Basics
 - 1.1 Use the struct capability in C.
 - 1.2 Explain the nature of member data of a given data structure.
 - 1.3 Create key methods that will be useful to manipulate data structures.
 - 2.0 Simple Linked Lists
 - 2.1 Explain the importance of a simple data structure such as a linked list.
 - 2.2 Implement a linked list using dynamic memory allocation.
 - 3.0 Other Linked Lists
 - 3.1 Implement a doubly-linked list.
 - 3.2 Implement a sorted linked list.
 - 3.3 Explain the usefulness of double-linked and sorted linked lists for handling data efficiently.
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4.0 Stacks and Queues

- 4.1 Implement a stack.
- 4.2 Implement a queue.
- 4.3 Explain the differences between a stack and a queue.

5.0 Circular Data Structures

- 5.1 Implement circular linked lists.
- 5.2 Implement circular arrays.
- 5.3 Explain when circular data structures are best used.

6.0 Hash Tables

- 6.1 Implement a hash table.
- 6.2 Explain the difference in efficiency between hash tables and other data structures.

7.0 Tree Structures

- 7.1 Explain how a tree works.
- 7.2 Explain how different types of trees have different uses and benefits.

8.0 Common Algorithms

- 8.1 Identify various established common algorithms.

9.0 Algorithm Efficiency

- 9.1 Analyze algorithm efficiency.
- 9.2 Evaluate algorithms according to efficiency.

10.0 C++ Standard Template Library

- 10.1 Use STL templates.
- 10.2 Evaluate appropriate uses of the STL.

Required Student Resources

Optional Student Resources

Evaluation

The minimum passing grade for this course is 55 (D).

In order to successfully complete this course, the student is required to meet the following evaluation criteria:

Assignments	20.00
Course Project	20.00
Quizzes, mini-assignments	10.00
Midterm	25.00
Final Exam	25.00
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	100.00 %

The student must also pass the average of the midterm and final exam marks.



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Other

Conestoga College is committed to providing academic accommodations for students with documented disabilities. Please contact the Accessibility Services Office.

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School Information Technology

Date 2014-08-27

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