

# *University College of the Cayman Islands*

## **ASSOCIATE DEGREE SYLLABUS**

**COURSE NAME: DATA STRUCTURES**

**COURSE #: COM 210**

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### **COURSE DESCRIPTION**

The purpose of this course is to provide the student with an understanding of the data structures and algorithms necessary to develop models of computation. Emphasis is placed on modularity, abstraction and verification as tools for computational problem solving,

**Credits: 3**

**Prerequisite: CO 151**

### **COURSE OBJECTIVES**

This course is intended to enable the student to:

1. Understand hierarchical view of algorithms.
2. Use control structures and data types in program development.
3. Apply explicit techniques in problem solving.
4. Examine data abstractions, the visibility of data structures and the motion of algorithms.
5. Implement efficient repetition and recursion techniques.
6. Implement techniques to ensure the correctness of algorithms.

### **COURSE OUTLINE**

#### **I Program Structures And Data Types**

Overview of data types – Real, Integer, Double, String  
Procedures local and global scope  
Passing parameters by value and by variable  
Nested procedure calls  
Functions declaration and calling

#### **II Control Structures**

Decision Structures – conditional, Two-way and nested Decisions  
Repetition by Iteration – While, Counter-Driven structures  
For and Repeat/Until structures  
Recursion Techniques

### **III Data Abstraction**

Enumerated data types  
Classes, Instances, encapsulation and inheritance  
Public and private classes  
Constructors and destructors

### **IV Arrays**

Types of arrays  
Arrays of records and sets  
File operations  
File pointer and File window

### **V Algorithms and Analysis**

Algorithms for searching and sorting  
Dynamic linked lists  
Stacks and Queues – Prefix and postfix expressions

## **ASSESSMENT**

Course Assignments/Project	-	30%
Mid-Semester Examination	-	20%
Final Examination	-	50%
<b>Total</b>		<b>100%</b>

## **REQUIRED TEXT**

The following textbook(s) will be used for this course:

1. **Schaffer Clifford**, *A Practical Introduction to Data Structures and Algorithm Analysis*, Prentice Hall

## **References**

**Millsbaugh A.C.**, *Business Programming in C*, Harcourt Brace

**Grady M. Tim**, *C! Programming Principals and Practices*, Mitchell Publishing

**Salmon William I.**, *Structures and Abstractions*, Richard Irwin