INTI International University & Colleges™

COURSE STRUCTURE

Name of Course: Data Structures

Course Code: DCS2101

Credit Hours: 4

Prerequisite/co-requisite: DCS1101 Programming Fundamentals

Summary: This course is aimed to develop in students an understanding of the concept of data structures and their operations. This course covers basic data structures such as linked-lists, stacks, queues, and trees. It also covers the topics on recursion, basic searching and sorting algorithms, and an overview of other data structures such as sets and maps.

Course Learning Outcomes:
Upon completing this course, the students will be able to:
CLO1: Explain the fundamentals of data structures including arrays, pointers, abstract data type, classes, linked-lists, trees, binary search trees, stacks, queues, and sorting algorithm. (C2, PLO1)
CLO2: Able to display the ability to use common data structures operations such as searching, insertion and deletion on linked list, stack, queue and binary search trees to solve problems computationally. (P3, PLO3)
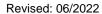
Course Format:

Total Student Learning Time (SLT) (L = Lecture; T = Tutorial; P = Practical; EL= E-Learning) :					
Learning Hours				**Independent Learning (hr)**	**Total Student Learning Time (hr)**
L	T	P	EL		
28	0	26	14	92	160

Teaching and Delivery Methods/ Teaching Methodology:

Lectures, Tutorial and Practical/Laboratory work delivered in a combination of blended & independent learning

E-Learning provided by INTI makes learning more accessible and convenient for the students. The blended model utilized by INTI is the integration of E-learning via INTI's Learning Management System and the conventional lecturer-led classroom activities. INTI students are required to access to the online learning materials (additional notes, reading materials, online assessments, discussion forums and etc.), so as to acquire a complete learning process. This also promotes self-directed learning in encouraging INTI students to be independent learners.

Syllabus:

Course Content Outline	CLO*
C++ Review - Multi File Projects, User Define Data Types, Pointers, Structures, Dynamic Arrays, Functions	1
Overview - Introduction, Data Types. Abstraction. Data abstraction and Abstract Data Types (ADTs)	1
Searching and Sorting - Introduction, Bubble Sort, Insertion Sort, Selection Sort, Quick Sort	1
Linked Lists - Single Linked Lists, Representation of Linked Lists in Memory, Traversing a Linked List Searching a Linked List, Memory Allocation; Garbage Collection, Insertion into a Linked List, Deletion from a Linked List, Double Linked Lists	2
Stacks - kArray & Linked Representation,Programs on stack,Push & Pop operations, Searching, Applications of Stack	2
Queues - Operations on Queue, Array & Linked Representation, Insert & Delete operations, Circular queue, Rrepresentation	2
Trees - Introduction, Binary Trees, Representing Binary Trees in Memory, Traversing Trees, Binary Search Tree, Searching and Inserting in Binary Search Trees, Deleting in a Binary Search Tree.	2

Student Evaluation:

Continuous Assessment		Percentage (%)	CLO
1	Project	30	2
2	Test	10	1
3	Assignment	20	2
Final Assessment		**Percentage (%)**	
Final Examination		40	1
Total		**100%**	

Final exam format:
Duration: 2 hours

Students are required to answer All questions.

Grading Scale:
A+ (90-100), A (80-89), A- (75-79), B+ (70-74), B (65-69), B- (60-64), C+ (55-59), C (50-54), C- (45-49), D (40-44), F (0-39), Resit Pass, RP (50-100), Resit Fail, RF (0-49)

IMPORTANT NOTE:
Students are required to "**PASS**" BOTH continuous and final assessment in order to pass the subject.

Additional Information: NetBeans IDE, Java Development Kit

Main Reference(s) Supporting Course:
1. Frank M. Carrano (2019), Data Structures and Abstraction with Java, 5th Edition, Pearson.

Additional References:
1. Y. Daniel Liang. (2018), Introduction to Java Programming and Data Structures, Comprehensive Version, 11th Edition, Pearson.

LABORATORY WORK: Nil