UNIVERSITI TEKNOLOGI MARA
CSC438: FUNDAMENTAL OF DATA STRUCTURES

Course Name (English)	FUNDAMENTAL OF DATA STRUCTURES `APPROVED`
Course Code	CSC438

MQF Credit	3

Course Description	In this course, we attempt to understand the concept of information organization and manipulation in a computer, emphasizing the use of data structure in problem solving. The object-oriented approach will be followed to develop the programming solutions

Transferable Skills	Demonstrate ability to identify and articulate self skills, knowledge and understanding confidently and in a variety of contexts

Teaching Methodologies	Lectures, Lab Work, Discussion

CLO	CLO1 Explain the fundamental concepts of data structures (C2)
	CLO2 Construct fundamental data structures using abstract data types (ADTs)(P3)
	CLO3 Determine effective solutions using fundamental data structures in Object-Oriented Programming approach (C4)

Pre-Requisite Courses	No course recommendations

Topics
1. Introduction to Data Structures 1.1) Concept of Abstract Data Types 1.2) Concept of Data Structure 1.3) Application of structured data 1.4) Implementation of Generic classes
2. List 2.1) Concept of List 2.2) Sequential List 2.3) Linked List 2.4) Concept in variation of linked list: Doubly linked list and Circular linked list
3. Queue 3.1) Concept of Queue 3.2) Queue Implementation 3.3) Queue Application
4. Stack 4.1) Concept of Stack 4.2) Stack Implementation 4.3) Stack Application
5. Recursion Technique 5.1) Concept of Recursion 5.2) Recursion function 5.3) Application of Recursion using Stack
6. Tree 6.1) Concept of Tree 6.2) Types of Binary Trees (BT): Complete BT, Strictly BT, Expression Tree 6.3) Concept of Binary Search Tree (BST) 6.4) Implementation of BST 6.5) Application of BST

Assessment Breakdown	%
Continuous Assessment	50.00%
Final Assessment	50.00%

Details of Continuous Assessment	Assessment Type	Assessment Description	% of Total Mark	CLO
	Assignment	Programming Assignment 1	5%	CLO2
	Assignment	Programming Assignment 2	5%	CLO2
	Assignment	Programming Assignment 3	5%	CLO2
	Assignment	Programming Assignment 4	5%	CLO2
	Quiz	Quiz 1(5%)	5%	CLO1
	Quiz	Quiz 2 (5%)	5%	CLO3
	Test	Test 1(10%)	10%	CLO1
	Test	Test 2 (10%)	10%	CLO3

Reading List	Recommended Text	**Michael T. Goodrich,Roberto Tamassia,Michael H. Goldwasser 2014,** *Data Structures and Algorithms in Java 6th Edition International Student Version*, **6th Edition International Student Version Ed., Wiley [ISBN: 9781118808573]**
		Debasish Chawdhuri 2017, *Java 9 Data Structures and Algorithms*, **Packt Publishing Birmingham, United Kingdom [ISBN: 1785889346]**
	Reference Book Resources	**Allen Downey 2017,** *Think Data Structures*, **3rd Edition Ed., O'Reilly Media Sebastopol, United States [ISBN: 9781491972397]**
		Kotiyana 2018, *Introduction To Data Structures and Algorithms in Java*, **3rd Edition Ed., Independently published [ISBN: 978179291346]**
		Narasimha Karumanchi 2016, *Data Structures and Algorithms Made Easy*, **3rd Edition Ed., Careermonk Publications Madinaguda, Hyderabad [ISBN: 9788193245279]**
		Frank M. Carrano,Timothy M. Henry 2018, *Data Structures and Abstractions with Java*, **3rd Edition Ed., Pearson Harlow, England [ISBN: 0134831691]**
Article/Paper List	This Course does not have any article/paper resources	
Other References	This Course does not have any other resources	