MULTIMEDIA UNIVERSITY®

COURSE INFORMATION

1 .	**Name of Course**	Data Structure and Algorithms	
2 .	**Course Code**	DCS5068	
3 .	**Type of Course** **(e.g. : Core, major, elective etc.)**	Core/ Major Subject	
4 .	**Synopsis**	This subject will assist students in designing, planning and implementing various data sturctures and algorithm for specific computer application	
5 .	**Version** **(State the date of theSenate's approval - previous and the current approval date)**	Current: June 2017 Previous: Senate 182 Dec 2015 New version: ADC Nov 2017 Senate 195 Jan 2018	
6 .	**Name(s) of Academic Staff**	Nur Liyana Binti Rosli, **Chandrika Mohd Jayothisa**, Ruzanna binti Abdullah	
7 .	**Semester and Year Offered**	Semester 1, Year 3,	
8 .	**Credit Value**	3	
9 .	**Pre-Requisite**	None	
10 .	**Objective of the course in the programme:**		
	Objective of the course in the programme: To introduce and acquire problem solving, algorithm design and programming skills. It covers the basic concepts and techniques of data abstraction, structures and algorithms such as sorting, searching, graph and tree that can be implemented in software design.		
11 .	**Justification for including the course in the programme:**		
	This subject will be useful for students in obtaining comprehensive understanding on what data structure and algorithms performs in a computer system using C++ programming language.		
12 .	**Course Learning Outcomes (CLO)**	**Domain**	**Level**
	CLO1: Explain the basic concepts and techniques of data structure and algorithm	Cognitive	2
	CLO2: Apply basic concepts of programming and techniques of data abstraction, structures and algorithms using programming software	Cognitive	3
	CLO3: Use the proper syntax and concepts of data structures and algorithms in solving programming problems.	Cognitive	3
	CLO4:		

13 . **Mapping of the Course Learning Outcomes to the Programme Learning Outcomes, Teaching Methods and Assessment:**

Course Learning Outcomes (CLO) (Must tally with CLOs in item 12)	Programme Learning Outcomes (PLO)								Teaching Methods	Assessment Method
	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8		
CLO1	✓								Lecture/Lab	Quiz/ Final / Midterm
CLO2	✓								**Lecture**/Lab	Lab
CLO3	✓								Group Discussion	Assignments
Total	**3**								*Indicate the relevancy between the CLO and PLO by ticking "✓" the appropriate relevant box (This description must be read together with standards 2.1.2, 2.2.1, and 2.2.2 in Area 2 – pages 16 & 18 of COPPA 2.0)*	

14 . **Transferable Skills:**

15 . **Distribution of Student Learning Time (SLT)**

	Course Content Outline	**CLO	Teaching and Learning Activities – Guided Learning (F2F)*				Guided Learning (NF2F)*	Independent Learning (NF2F)*	Total SLT
			*L	*T	*P	*O			
1	**Topic 1: Introduction to Data Structure and Algorithm.** **This chapter introduce on C++ basic programming language. It includes definition and implementation on data types, Arrays, data structures, class, ADT's**	**CLO1**	4		2		1	4.5	11.5
2	**Topic 2: Pointer and Pointer Variables.** **This chapter introduce on how computer can be imagined as a succession of memory cells. It includes Pointers and Pointers Variable.**	**CLO1**	2		2		1	2.5	7.5
3	**Topic 3: Stacks and Queues Array Implementation** **This chapter review on Stack and Queue implementation.**	**CLO2**	4		2		1	4.5	11.5
4	**Topic 4: Lists and Linked Lists** **This chapter discuss on a list and linked list of a sequence elements and its operations such as Create, determine list is empty or not, determine list is full or not, find a size of list and even add a new entry to the end of list.**	**CLO2**	2		2		1	2.5	7.5
5	**Topic 5: Linked Stacks and Queues** **In this chapter, it reviews on structure for element of the stack and queue. Besides, this chapter explained on accessing the nodes in a linked list via pointers, adding, inserting and removing from element from the list.**	**CLO2**	2		2		1	2.5	7.5
6	**Topic 6: Searching** **This chapter review and analysis on searching method and implementation of two types of searching; sequential search and binary search.**	**CLO2**	2		2		1	2.5	7.5
7	**Topic 7: Hashing** **This chapter discuss on Hashing and how to obtain the hash code for a keyword and map a key to an index. It explained on how to handle collision using several types of methods.**	**CLO3**	2		2		1	2.5	7.5
8	**Topic 8: Sorting** **This chapter review and analysis on several types of sorting; insertion sort, selection sort, sell sort, quick sort and merge sort.**	**CLO3**	2		2		1	2.5	7.5
9	**Topic 9: Binary Tree** **This chapter define on binary tree and its implementation on traversal of binary tree, Insertion Node, Deleting Node, binary search tree and building binary tree. From Binary tree as well, it can representing of algebraic expressions by postfix, prefix and infix methods.**	**CLO3**	2		2		1	2.5	7.5
10	**Topic 10: Graphs** **This chapter introduce several types of graphs such as directed, undirected and weighted graphs. It explains on how to build an adjacency matrix and adjacency list from given graphs.**	**CLO3**	2		2			3.5	7.5

		Total SLT	**83**
	SUMMATIVE ASSESSMENT		
	1. Continuous Assessment	**Percentage %**	**Total SLT**
	Case Studies/Quiz	10%	3
	Lab	10%	5
	Assignments	15%	6
	Test	15%	8
		Total SLT for Continuous Assessment	**22**
	2. Final Assessment	**Percentage %**	**Total SLT**
			F2F / **ILT**
	Final Exam	50%	2 / 13
		Total SLT for Final Assessment (F2F + NF2F)	**15**
	Grand Total	**100%**	**120**
	****Indicate the CLO based on the CLO's numbering in Item 12.** ***L= Lecture, *T= Tutorial, *P= Practical, *O= Others, F2F*= Face to Face, NF2F*= Non Face to Face**		
16 .	**Identify Special Requirement to Deliver the Course (e.g., software, nursery, computer lab, simulation room):** Dev C		
17 .	**Main References:** Mark A. Weiss (2014), Data Structures and Algorithms Analysis in C++, 4th Edition, Pearson Education Limited.		
18 .	**Additional References:** 1. Adam Drozdek (2004), Data Structures and Algorithms in C++, Third Edition, Thomson Leaning. 2. William Ford, (2002.), William Topp , Data Structures with C++ Using STL, 2nd Edition, Prentice Hall 3. Richard F.Gilberg, Behrouz A Forouzan, (2001.), Data Structure: A Pseudocode Approach with C++, Thomson Learning.		

Note:

	Cells shaded light grey contain formulas / fixed values. Edit these formulas only if needed.