

SUMMARY OF INFORMATION ON EACH COURSE

1.	Name of Course	Data Structures and Algorithms	
2.	Course Code	TDS 2111	
3.	Status of Course [Applies to (cohort)]	Common Core for B.IT (Hons) Data Communications and Networking B.IT (Hons) Information Technology Management B.IT (Hons) Artificial Intelligence B.IT (Hons) Security Technology B.Sc (Hons) Bioinformatics	
4.	MQF Level/Stage Note : <i>Certificate – MQF Level 3</i> <i>Diploma – MQF Level 4</i> <i>Bachelor – MQF Level 6</i> <i>Masters – MQF Level 7</i> <i>Doctoral – MQF Level 8</i>	Bachelor – MQF Level 6	
5.	Version (State the date of the Senate approval – history of previous and current approval date)	Date of previous version :	June 2012
		Date of current version :	June 2014
6.	Pre-Requisite	TCP1121 Computer Programming	
7.	Name(s) of academic/teaching staff	Chong Lee Ying Wee Kuok Kwee Mohd Fikri Azli bin Abdullah	
8.	Semester and Year offered	Trimester 1, Year 2	
9.	Objective of the course in the programme : To provide a good understanding of data structures and their implementation. Students are also expected to analyse and design basic algorithms.		
10.	Justification for including the course in the programme : This subject teaches students how to design, develop and evaluate data structures and algorithms to meet predefined quality characteristics of functionality (suitability) and usability (understandability, learnability, operability, compliance). Software solutions are implemented using C++ or Java. Concepts, theories and technologies underlying the methods and techniques are introduced and explained as required.		
11.	Course Learning Outcomes :		Domain
	LO1 Define basic concept of data structures.		Cognitive
	LO2 Explain the data structures and algorithms.		Cognitive
	LO3 Compare the algorithms.		Cognitive
		Level	
			Level 1
			Level 5
			Level 6

SUMMARY OF INFORMATION ON EACH COURSE

	LO4 Create a program by implementation of algorithms or data structures.	Cognitive	Level 5
12.	Mapping of Learning Outcomes to Programme Outcomes :		
	Learning Outcomes	PO1	PO2
	LO1		X
	LO2		X
	LO3		X
	LO4	X	X
13.	Assessment Methods and Types :		
	Method and Type	Description/Details	Percentage
	Quiz	Written examination	10%
	Mid Test	Written examination	20%
	Lab Test	Practical examination	10%
	Assignment	Written report, implemented programs, individual project	20%
	Final Exam	Written examination	40%
14.	Mapping of assessment components to learning outcomes (LOs)		
	Assessment Components	%	LO1
	Quiz	10%	12.5
	Mid Test	20%	25
	Lab Test	10%	12.5
	Assignment	20%	
	Final Exam	40%	50
	Total	100%	100
15.	Details of Course		
	Topics	Mode of Delivery (eg : Lecture, Tutorial, Workshop, Seminar, etc.) Indicate allocation of SLT (lecture, tutorial, lab) for each subtopic	
		Lecture	Lab
	1. Data Types & ADT Data types, Arrays & Pointers, Data structures, ADTs & implementation, objects, classes. Programming language support for ADTs.	4	4
	2. Data Structures Stacks: implementation & linked stacks. Recursion: Backtracking & Look-Ahead. Queues: circular, linked. Polynomial arithmetic. List & strings.	6	6

SUMMARY OF INFORMATION ON EACH COURSE

	3. Searching and Sorting. Big Oh notation. Sequential search, binary search, comparison trees, Insertion sort, selection sort, shell sort, quicksort, mergesort, Radix sort & Heapsort. Hashing. Analysis of these searching and sorting techniques.	6	6
	4. Trees Binary trees. Traversal of binary tree. Binary search trees: Insertion and deletion & building binary trees. Height balance. Multiway trees. Polish Notation.	4	4
	5. Graphs Graph ADT. Graph traversal, depth-first & breadth-first algorithms. Shortest Paths, best-first, uniform-cost traversals.	4	4
	Total	24	24
	Total Student Learning Time (SLT)	Face to Face	Total Guided and Independent Learning
	Lecture	24	24
	Tutorials	-	-
	Laboratory/Practical	24	12
	Quizzes (x 2 times)	-	2
	Presentation	-	-
	Assignment	-	12
	Mid Term Test	1	4
	Final Exam	2	15
	Sub Total	51	69
	Total SLT	120	
16.	Credit Value	3	
17.	Reading Materials :		
	Textbooks		
	Carrano, F. and Henry, T (2016). ADTs, Data Abstraction and Problem Solving with C++, 7 th ed. Pearson.		
	Reference Material		
	1. Carrano, F. and Henry, T (2012). ADTs, Data Abstraction and Problem Solving with C++, 6 th ed. Pearson.		
	2. Drozdek, A (2012). ADTs, Data Structures and Algorithms in C++, 4 th ed. Cengage Learning.		

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Appendix (to be compiled when submitting the complete syllabus for the programme) :

1. Mission and Vision of the University and Faculty
2. Programme Objectives or Programme Educational Objectives
3. Programme Outcomes (POs)
4. Mapping of POs to the 8 MQF domain
5. Summary of the Bloom's Taxonomy's Domain Coverage in all the Los in the format below :

Subject	Learning Outcomes (please state the learning Outcomes)	Bloom's Taxonomy Domain		
		Affective	Cognitive	Psychomotor
ABC1234	Learning Outcome 1			
	Learning Outcome 2			
	Learning Outcome 3			
	Learning Outcome 4			
DEF5678	Learning Outcome 1			
	Learning Outcome 2			
	Learning Outcome 3			
	Learning Outcome 4			

6. Summary of LO to PO measurement
7. Measurement and Tabulation of result for LO achievement
8. Measurement Tabulation of result for PO achievement