APPROVED

COMP C7012: Algorithms

Module Details

Module Code:	COMP C7012
Full Title:	Algorithms APPROVED
Valid From::	Semester 1 - 2019/20 (June 2019)
Language of Instruction:	English
Duration:	1 Semester
Credits::	5
Module Owner::	Michelle Graham
Departments:	Unknown
Module Description:	Students completing this module will be able to analyse, select and implement appropriate algorithms for a range of problems.

Module Learning Outcome	
On successful completion of this module the learner will be able to:	
#	**Module Learning Outcome Description**
MLO1	Implement a selection of well-known algorithms.
MLO2	Analyse the efficiency of an algorithm.
MLO3	Choose the most appropriate algorithm (custom or existing) for use in a given scenario.

Pre-requisite learning
Module Recommendations *This is prior learning (or a practical skill) that is strongly recommended before enrolment in this module. You may enrol in this module if you have not acquired the recommended learning but you will have considerable difficulty in passing (i.e. achieving the learning outcomes of) the module. While the prior learning is expressed as named DkIT module(s) it also allows for learning (in another module or modules) which is equivalent to the learning specified in the named module(s).*
No recommendations listed

Module Indicative Content
Algorithm Design What is an algorithm, properties of an algorithm, debugging algorithms
Array manipulation Insertion, deletion, removal of duplicates, partitioning, merging
Algorithm analysis Big O notation, comparison of algorithms.
Searching algorithms Design and implementation of a selection of searching algorithms (linear search & binary search)
Sorting algorithms Design and implementation of a selection of sorting algorithms (selection sort and bubble sort)
Recursion Recursive design and implementation, when to use recursion, implementing recursive-based algorithms (merge sort, quick sort, revisiting binary search)

Module Assessment

Assessment Breakdown	%
Course Work	60.00%
Final Examination	40.00%

Module Special Regulation

Assessments

Full Time On Campus

Course Work

Assessment Type	Class Test	**% of Total Mark**	20
Marks Out Of	0	**Pass Mark**	0
Timing	S1 Week 6	**Learning Outcome**	1
Duration in minutes	120		

Assessment Description
Lab exam

Assessment Type	Continuous Assessment	**% of Total Mark**	20
Marks Out Of	0	**Pass Mark**	0
Timing	Every Week	**Learning Outcome**	1,3
Duration in minutes	0		

Assessment Description
Formative assessment comprised of weekly exercise sets.

Assessment Type	Continuous Assessment	**% of Total Mark**	20
Marks Out Of	0	**Pass Mark**	0
Timing	S1 Week 12	**Learning Outcome**	1,2,3
Duration in minutes	0		

Assessment Description
Final project in which students are provided with a problem and required to select and implement appropriate algorithms (justifying the selection through analysis of candidate algorithms) to solve this problem.

No Project

No Practical

Final Examination

Assessment Type	Formal Exam	**% of Total Mark**	40
Marks Out Of	0	**Pass Mark**	0
Timing	End-of-Semester	**Learning Outcome**	1,2
Duration in minutes	120		

Assessment Description
End of semester written examination.

Part Time On Campus

Course Work

Assessment Type	Continuous Assessment	**% of Total Mark**	20
Marks Out Of	0	**Pass Mark**	0
Timing	Every Week	**Learning Outcome**	1,3
Duration in minutes	0		

Assessment Description
Formative assessment comprised of weekly exercise sets.

Assessment Type	Class Test	**% of Total Mark**	20
Marks Out Of	0	**Pass Mark**	0
Timing	S1 Week 6	**Learning Outcome**	1
Duration in minutes	120		

Assessment Description
Lab exam

Assessment Type	Continuous Assessment	**% of Total Mark**	20
Marks Out Of	0	**Pass Mark**	0
Timing	S1 Week 12	**Learning Outcome**	1,2,3
Duration in minutes	0		

Assessment Description
Final project in which students are provided with a problem and required to select and implement appropriate algorithms (justifying the selection through analysis of candidate algorithms) to solve this problem.

No Project

No Practical

Final Examination

Assessment Type	Formal Exam	**% of Total Mark**	40
Marks Out Of	0	**Pass Mark**	0
Timing	End-of-Semester	**Learning Outcome**	1,2
Duration in minutes	120		

Assessment Description
End of semester written examination.

Reassessment Requirement

A repeat examination
Reassessment of this module will consist of a repeat examination. It is possible that there will also be a requirement to be reassessed in a coursework element.

Module Workload

Workload: Full Time On Campus					
Workload Type	*Contact Type*	*Workload Description*	*Frequency*	*Average Weekly Learner Workload*	*Hours*
Practical	Contact	2 * 2 hour labs covering a combination of practical (development and design) and theoretical (concepts and theory of algorithms) content	Every Week	4.00	4
Directed Reading	Non Contact	Course-related materials for discussion in class	Every Week	1.00	1
Independent Study	Non Contact	Practice and extra study to reinforce classwork	Every Week	3.00	3
				Total Weekly Learner Workload	8.00
				Total Weekly Contact Hours	4.00

Workload: Part Time On Campus					
Workload Type	*Contact Type*	*Workload Description*	*Frequency*	*Average Weekly Learner Workload*	*Hours*
Practical	Contact	2 * 2 hour labs covering a combination of practical (development and design) and theoretical (concepts and theory of algorithms) content	Every Week	4.00	4
Directed Reading	Non Contact	Course-related materials for discussion in class	Every Week	1.00	1
Directed Reading	Non Contact	Practice and extra study to reinforce classwork	Every Week	3.00	3
				Total Weekly Learner Workload	8.00
				Total Weekly Contact Hours	4.00

Module Resources

Recommended Book Resources

Robert Sedgewick & Kevin Wayne. (2015), Algorithms, 4th. Addison-Wesley Professional, p.984, [ISBN: 978-013438468].

Supplementary Book Resources

Robert Sedgewick & Kevin Wayne. (2016), Computer Science: An Interdisciplinary Approach, 1st. Addison-Wesley Professional, p.1168, [ISBN: 978-013407642].
George T. Heineman, Gary Pollice & Stanley Selkow. (2015), Algorithms in a Nutshell: A Practical Guide, 2nd. O'Reilly Media, p.425, [ISBN: 978-149194892].
Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein. (2009), Introduction to Algorithms, 3rd. MIT Press, p.1312, [ISBN: 978-026203384].

This module does not have any article/paper resources

This module does not have any other resources