Liverpool John Moores University

Title:	Data Structures and Algorithms
Status:	Definitive
Code:	**5000ELE** (120044)
Version Start Date:	01-08-2018
Owning School/Faculty:	Electronics and Electrical Engineering
Teaching School/Faculty:	Electronics and Electrical Engineering

Team	Leader
Paul Otterson	Y

Academic Level:	FHEQ5	**Credit Value:**	20	**Total Delivered Hours:**	74
Total Learning Hours:	200	**Private Study:**	126		

Delivery Options
Course typically offered: Standard Year Long

Component	Contact Hours
Lecture	24
Practical	48

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Exam	Exam	Exam	50	2
Report	Report 1	Application of Data Structures	20	
Report	Report 2	Algorithm Exam	30	

Aims

Examine the data structures used in modern computer applications
Understand the algorithms that efficiently use those data structures

Learning Outcomes

After completing the module the student should be able to:

1	Choose the most appropriate data structure for a particular problem
2	Discuss a number of important computer algorithms and data structures
3	Explain how to evaluate an algorithm for efficiency
4	Apply a simple data structure
5	Use data structures and apply algorithms to solve a complex problem
6	Use Pointers and appropriate programme structure

Learning Outcomes of Assessments

The assessment item list is assessed via the learning outcomes listed:

Exam	2		
Application of data structures	4	6	
Application of Algorithms	1	3	5

Outline Syllabus

Data Structures, List, Stack, Queue, Tree, Hash Table.

Sorting, Bubble Sort, Selection Sort, Insertion Sort, Shellsort, MergeSort, QuickSort, Bucket Sort, Radix sort, Tree traversal, Breadth/Depth first search. Shortest path, Dijkstra's.

Searching, Sequential Search, Binary Search, Binary Search Tree.

Minimum spanning tree, Prim's and Kruskal's Algorithms.

Learning Activities

Lecture, demonstration and practical activities applying topics discussed.

Notes

This module introduces the importance of the use of relevant data structures and algorithms in program design.