

Module Details	
Module Title:	Data Structures and Algorithms
Module Code:	COS5021-B
Academic Year:	2019-20
Credit Rating:	20
School:	Department of Computer Science
Subject Area:	Computer Science
FHEQ Level:	FHEQ Level 5
Pre-requisites:	
Co-requisites:	

Contact Hours	
Type	Hours
Lectures	12
Tutorials	12
Laboratory	24
Directed Study	152

Availability	
Occurrence	Location / Period
BDA	University of Bradford / Semester 1 (Sep - Jan)

Module Aims
To introduce computational thinking for problem solving as core computer science knowledge that all computing practitioners are expected to know and use: to explore computational aspects of data representation and to develop familiarity with well-established and proven solutions to problems that occur frequently throughout computing and practical computing applications.

Outline Syllabus
Pseudocode. Estimating algorithm running time: complexity analysis; asymptotic order notation. Abstract Data Types. ADTs, implementations and running times for linear structures (stacks,

queues, lists, hash tables), binary trees (ordered, balanced, complete), multi-way trees, graphs. Searching and sorting methods.

Learning Outcomes

1	recognise common data structures and fundamental algorithms and be familiar with the associated terminology;
2	define Abstract Data Types in terms of their data structures;
3	identify algorithms and demonstrate their operation and effect in solving problems;
4	assess efficiency of various implementations and justify choice of implementation for any particular application;
5	construct and test simple algorithms using suitable data structures, analyse the complexity and running times for algorithms.

Learning, Teaching and Assessment Strategy

As fundamental part of Computer Science, Data Structures and Algorithms are introduced for each topic by a set of exercises designed to build knowledge, promote understanding and develop problem-solving skill. For each topic lectures expose concepts and introduce material and terminology in context. Tutorials provide opportunity for individual tuition. Assessment is aligned.

Mode of Assessment

Type	Method	Description	Length	Weighting
Summative	Examination - closed book	Examination	2 hours	50%
Summative	Coursework	Course work (2 Computing exercises).	2000 words or equivalent	50%

Reading List

To access the reading list for this module, please visit <https://bradford.rl.talis.com/index.html>.

Please note:

This module descriptor has been published in advance of the academic year to which it applies. Every effort has been made to ensure that the information is accurate at the time of publication, but minor changes may occur given the interval between publishing and commencement of teaching. Upon commencement of the module, students will receive a handbook with further detail about the module and any changes will be discussed and/or communicated at this point.