

Module Specification

Module Summary Information

1	Module Title	Data Structures and Algorithms
2	Module Credits	20
3	Module Level	4
4	Module Code	CMP4272

5	Module Overview
Data structures and algorithms are essential in computer science, software engineering, and computer games and graphics programming. Data structures are structured representations of data; the design of a data structure determines how operations (such as reading to, writing from, modifying, or computing with the data) can be achieved. An algorithm is a set of instructions which can be followed in order to solve a computational problem. This module will equip you with the necessary background knowledge about common data structures and algorithms. It will develop your skills for writing them, and analysing their efficiency and correctness. You will cover topics such as how computers represent and operate on arrays, lists, sets, queues, stacks, graphs and networks, as well as how to write and analyse algorithms. This module will also prepare you for future programming modules and projects, and develops knowledge and skills necessary for employment in software development, game development, computer graphics, and related fields. Standard data structures and algorithms are also common topics for job interview questions.	

6	Indicative Content
• Memory representations of data types • Abstract data types • List data structures • Trees, graphs and networks • Recursion • Simple plans for writing algorithms • Searching and sorting algorithms • Geometric data structures and algorithms • Algorithm design and strategies • Algorithm efficiency analysis • Algorithm correctness analysis	

7	Module Learning Outcomes		
	On successful completion of the module, students will be able to:		
	1	Demonstrate knowledge of fundamental concepts of data structures and algorithms.	
	2	Explain the purpose, design and properties of standard data structures.	
	3	Write simple algorithms using appropriate discrete data structures to solve computational problems.	
	4	Use appropriate methods to analyse the efficiency and correctness of algorithms.	

8	Module Assessment		
Learning Outcome			
	Coursework	Exam	In-Person
1-4	X		

9	Breakdown Learning and Teaching Activities	
Learning Activities		Hours
Scheduled Learning (SL) includes lectures, practical classes and workshops, peer group learning, Graduate+, as specified in timetable		48
Directed Learning (DL) includes placements, work-based learning, external visits, on-line activity, Graduate+, peer learning, as directed on VLE		104
Private Study (PS) includes preparation for exams		48
Total Study Hours:		200