

Module Code	Pre-requisite Module codes	Co-Requisite Modules code(s)	ISCED Code	Subject Code	ECTS Credits	NFQ Level (CPD)#
CMPU1017	CMPU1026				10	6
Module Title	Programming & Algorithms 2					

Programming and Algorithms 2

School Responsible:	School of Computing
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Module Overview:

This module is a continuation of the Programming and Algorithms 1 module and it addresses the need of students to develop their understanding of programming and algorithms.

The aims of this module are to:

- Teach the more advanced aspects of programming
- Teach a range of advanced approaches to software development and data management.

Learning Outcomes (LO):

On Completion of this module, the learner will be able to

1	Design and write advanced computer programs.
2	Test computer programs using an appropriate environment.
3	Implement advanced algorithms and data structures.
4	Write programs that can interact with a range of data stores, databases and application programming interfaces.
5	Write programs to implement advanced algorithms, data structures and architectural patterns.

Indicative Syllabus:

- Advanced programming using procedural and object-oriented paradigms as appropriate.
- Advanced Data Structures: Lists, Stacks, Queues and Heaps.
- Advanced Algorithms such as: Shell, Quick, Merge, Heap. Binsort and Radix sort.
- Data Management: Text files, Binary files, serial, sequential and random access. Creation, deletion and tests for the existence of files. File input and output. Database manipulation, API interaction, basic network programming.
- Testing: Objectives and principles of testing. Choosing appropriate test data. Testing and debugging strategies.
- Architectural and design patterns: such as Model-View-Controller, Singleton, Observer, Decorator, Iterator

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Learning and Teaching Methods:

The course delivery involves a combination of lectures and labs which may incorporate the use of blended learning techniques as appropriate throughout the delivery.

Total Teaching Contact Hours	39
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Total Self-Directed Learning Hours	148
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Module Delivery Duration:

Indicate if the module is normally delivered for example over one semester or less, or over one academic year etc.

Assessment

Assessment Type	Weighting (%)	LO Assessment (No.)
Final Exam	70	1-5
In Class Examination	30	1-5
Module Specific Assessment Arrangements (if applicable)		
(a) Derogations from General Assessment Regulations		
(b) Module Assessment Thresholds		
(c) Special Repeat Assessment Arrangements		

Essential Reading: (author, date, title, publisher)

- Depending on the language used in this module, specific reading lists will be specified in advanced of the start of the module.

Supplemental Reading

- T Cormen, C Leiserson, R Rivest, C Stein (2009), Introduction to Algorithms, MIT Press

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Robert Sedgewick (1997), Algorithms in C, Parts 1-4: Fundamentals, Data Structures, Sorting, Searching (3rd Edition), Addison-Wesley

Version No:		Amended By	
Commencement Date		Associated Programme Codes	

Modules that are to be offered as Stand-Alone CPD Programmes must have an NFQ level assigned

*Details of the assessment schedule should be contained in the student handbook for the programme stage.

Date of Academic Council approval

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