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MODULE DESCRIPTOR			
Module Title			
Computer Architecture and Programming			
Reference	EN1542	Version	1
Created	July 2023	SCQF Level	SCQF 7
Approved	June 2021	SCQF Points	15
Amended	August 2022	ECTS Points	7.5

Aims of Module

To provide the student with the ability to describe and utilize digital electronic devices, circuits and systems and to carry out analysis of simple digital circuits. Also to develop, test and document structured software in a high-level language to solve engineering problems.

Learning Outcomes for Module

On completion of this module, students are expected to be able to:

1	Understand the fundamentals of computer organisation and instruction set architectures
2	Demonstrate the ability to use a development system for a high level programming language.
3	Develop modular structured programs in a high-level programming language to prescribed standards and specifications.
4	Explain the characteristics of a typical programming language, algorithms and data structures and the process of software development.

Indicative Module Content

Hardware: Fundamentals of computer design; Von Neumann architecture; instruction set design; memory hierarchies; cache organisation and performance analysis; main memory organization; pipelining, hazards, various design approaches. Software development: algorithms, source and object code, compilers, the edit-compile-execute cycle, software design, testing, standards and documentation. Syntax of a high-level language: constants and variables, data types, pointers, arrays and data structures; program expressions and statements, input and output, selection and repetition control structures; modular programming, library and user functions, parameter passing, macros.

Module Delivery

This module is taught using a structured programmed of lectures, tutorials and laboratory exercises supplemented by directed reading and student-centred learning.

Indicative Student Workload

	Full Time	Part Time
Contact Hours	60	N/A
Non-Contact Hours	90	N/A
Placement/Work-Based Learning Experience [Notional] Hours	N/A	N/A
TOTAL	150	N/A
Actual Placement hours for professional, statutory or regulatory body		

ASSESSMENT PLAN

If a major/minor model is used and box is ticked, % weightings below are indicative only.

Component 1

Type:	Coursework	Weighting:	50%	Outcomes Assessed:	2, 3, 4

Description: Coursework of software development.

Component 2

Type:	Coursework	Weighting:	50%	Outcomes Assessed:	1

Description: online quiz

MODULE PERFORMANCE DESCRIPTOR

Explanatory Text

Each component comprises 50% of the module grade. To pass the module, a D grade is required.

		Coursework:						
		A	**B**	**C**	**D**	**E**	**F**	**NS**
	A	A	A	B	B	E	E	
	B	A	B	B	C	E	E	
	C	B	B	C	C	E	E	
Coursework:	**D**	B	C	C	D	E	E	
	E	E	E	E	E	E	F	
	F	E	E	E	E	F	F	
	NS	Non-submission of work by published deadline or non-attendance for examination						

Module Requirements

Prerequisites for Module	None.
Corequisites for module	None.
Precluded Modules	None.

INDICATIVE BIBLIOGRAPHY

1	F. Wempen, "Computing Fundamentals: Introduction to Computers," Sybex, January 2015. ISBN: 9781119039716.
2	WEERT, P.V. and GREGOIRE, M., 2016. C++ standard library quick reference. Berkeley, CA: Apress.
3	HORTON, I., 2014. Beginning C++. Berkeley, CA: Apress.
4	SUTHERLAND, B., 2015. C++ recipes: a problem-solution approach. Berkeley, CA: Apress.