

MODULE DESCRIPTOR

Module Title

Computer Architecture and Programming

Reference	EN1542	Version	2
Created	November 2023	SCQF Level	SCQF 7
Approved	June 2021	SCQF Points	15
Amended	April 2024	ECTS Points	7.5

Aims of Module

To equip students with the skills to articulate computer architecture concepts and proficiently design, test, and implement software programs in high-level languages to address engineering challenges.

Learning Outcomes for Module

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

- 1 Describe foundational principles of computer architecture and hardware.
- 2 Implement modular structured programs in a high-level programming language to prescribed standards and specifications.
- 3 Define the characteristics of a typical programming language, algorithms and data structures and the process of software development.

Indicative Module Content

Hardware: Fundamentals of computer architecture (such as Von Neumann architecture), instruction set, memory hierarchies, main memory organisation, cache organisation, parallelism, pipelining, and hazards. 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 programme 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
<i>Actual Placement hours for professional, statutory or regulatory body</i>		

ASSESSMENT PLAN			
<i>If a major/minor model is used and box is ticked, % weightings below are indicative only.</i>			
Component 1			
Type:	Coursework	Weighting: 50%	Outcomes Assessed: 2, 3
Description:	Coursework of software development		
Component 2			
Type:	Examination	Weighting: 50%	Outcomes Assessed: 1
Description:	Closed book assessed tutorials or online quizzes.		

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
Coursework:	A	A	A	B	B	E	E
	B	A	B	B	C	E	E
	C	B	B	C	C	E	E
	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.