

MODULE DESCRIPTOR

Module Title

Introduction to Digital Electronics and Engineering Programming

Reference	EN1541	Version	3
Created	May 2022	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 Describe digital electronic devices and systems and explain their principles of operation.
- 2 Design, construct, and analyse basic digital circuits.
- 3 Demonstrate the ability to use a development system for a high level programming language and create programs using it.
- 4 Design, code, test and document modular structured programs in a high-level programming language to prescribed standards and specifications.
- 5 Explain the characteristics of a typical programming language, algorithms and data structures and the process of software development.

Indicative Module Content

Introduction to digital electronics: Boolean algebra, truth tables and Karnaugh maps. Synthesis and analysis of basic combinatorial circuits. Sequential logic, flip-flops, registers and counters. 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
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:	3, 4, 5
Description:	Coursework of software development.				

Component 2

Type:	Coursework	Weighting:	50%	Outcomes Assessed:	1, 2
Description:	Coursework on principles and practice of digital electronics.				

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	B	B	E	E	
	B	A	B	C	E	E	
	C	B	B	C	E	E	
	D	B	C	C	D	E	
	E	E	E	E	E	F	
	F	E	E	E	E	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 FLOYD, T.L., 2015. Digital Fundamentals. 11th ed. Harlow: Pearson.
- 2 STOREY, N., 2013. Electronics: a Systems Approach. 5th ed. Harlow: Pearson.
- 3 WEERT, P.V. and GREGOIRE, M., 2016. C++ standard library quick reference. Berkeley, CA: Apress.
- 4 HORTON, I., 2014. Beginning C++. Berkeley, CA: Apress.
- 5 SUTHERLAND, B., 2015. C++ recipes: a problem-solution approach. Berkeley, CA: Apress.