MODULE DESCRIPTOR

Module Title

Introduction to Digital Electronics and Engineering Programming

Reference	EN1541	Version	2
Created	August 2021	SCQF Level	SCQF 7
Approved	June 2021	SCQF Points	15
Amended	August 2021	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 programmed of lectures, tutorials and laboratory exercises supplemented by directed reading and student-centred learning.

Module Ref:	EN1541 v2

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:	25%	Outcomes Assessed:	1, 5
Description:	Assessed tutorials or quizzes under exam conditions.				

Component 2

Type:	Examination	Weighting:	25%	Outcomes Assessed:	4
Description:	Open-book programming examination.				

Component 3

Type:	Coursework	Weighting:	50%	Outcomes Assessed:	2, 3
Description:	Logbook of practical activities.				

MODULE PERFORMANCE DESCRIPTOR

Explanatory Text

To pass the module the student must achieve a minimum of a grade D. Non-submission of any component will result in an NS grade.

Module Grade	Minimum Requirements to achieve Module Grade:
A	A in Component 3 and at least B in remaining components.
B	A in Component 3 and at least D in remaining components OR B in Component 3 and at least C in remaining components.
C	C in Component 3 and at least D in remaining components OR D in Component 3 and at least B and D in remaining components.
D	D in Component 3 and at least D in remaining components.
E	E in one or more components.
F	F in one or more components.
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.

Module Ref:	EN1541 v2

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.