

MODULE DESCRIPTOR

Module Title

Computer Engineering

| | | | |
|-----------|----------------|-------------|--------|
| Reference | EN2541 | Version | 4 |
| Created | August 2021 | SCQF Level | SCQF 8 |
| Approved | September 2017 | SCQF Points | 15 |
| Amended | August 2021 | ECTS Points | 7.5 |

Aims of Module

To provide the student with the ability to describe the operation of microcomputer systems and develop, test and document structured software in a high-level language.

Learning Outcomes for Module

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

- 1 Describe the structure of a microcomputer system and explain its principles of operation.
- 2 Apply knowledge of hardware software in the use of a microprocessor development system.
- 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

Microcomputer systems: operation of the CPU, registers, ALU, control unit, address, data and control buses, memory, input/output ports, system clock and timing, the fetch-execute cycle and memory maps. Machine instructions: opcodes, operands and addressing modes, data transfer, arithmetic and logical operations, control structures, flags, subroutines. 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 delivered 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 | 36 |
| Non-Contact Hours | 90 | 114 |
| Placement/Work-Based Learning Experience [Notional] Hours | N/A | N/A |
| TOTAL | 150 | 150 |
| <i>Actual Placement hours for professional, statutory or regulatory body</i> | | |

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: | 2, 3 |
| Description: | Logbook. | | | | |

Component 2

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

Component 3

| | | | | | |
|--------------|--------------------------|------------|-----|--------------------|------|
| Type: | Examination | Weighting: | 50% | Outcomes Assessed: | 1, 5 |
| Description: | Closed book examination. | | | | |

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.

INDICATIVE BIBLIOGRAPHY

- 1 WEERT, P.V. and GREGOIRE, M., 2016. C++ standard library quick reference. Berkeley, CA: Apress.
- 2 HORTON, I., 2014. Beginning C++. Berkeley, CA: Apress.
- 3 SUTHERLAND, B., 2015. C++ recipes: a problem-solution approach. Berkeley, CA: Apress.