

MODULE DESCRIPTOR

Module Title

Computer Architecture

Reference	EN3540	Version	7
Created	February 2018	SCQF Level	SCQF 9
Approved	March 2004	SCQF Points	15
Amended	March 2018	ECTS Points	7.5

Aims of Module

To provide the student with the ability to evaluate the operation of microprocessor-based computer systems and to design and implement software for real-time operation.

Learning Outcomes for Module

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

- 1 Evaluate the design of microprocessor input/output sub-systems.
- 2 Design and implement linked C and assembly language programs.
- 3 Design and implement polled and interrupt driven peripheral interface software.
- 4 Design, build and test a software product incorporating some or all of: linked C and assembly language, hardware interfacing and real-time operations.

Indicative Module Content

Microprocessor system design: nature of embedded real-time systems, hardware requirements, impact on software development, exceptions and interrupts, industrial applications, case studies. Integrated and external peripherals: timers, analogue to digital and digital to analogue conversion, serial peripheral interfaces (e.g. SPI, I2C), serial bus peripherals and memory; working with manufacturers data sheets and application notes. Software development: software development process; cross-compilation and linkage of C and assembly language; debugging support; input/output programming - polled and interrupt driven (e.g. ADC, SPI, Key Wakeup);

Module Delivery

The module is taught using a structured programme of lectures, tutorials, laboratories and student-centred learning leading to a significant project-based activity.

Indicative Student Workload

	Full Time	Part Time
Contact Hours	44	36
Non-Contact Hours	106	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:	50%	Outcomes Assessed:	1, 2, 3
Description:	Software development exercises for microprocessor interfacing				

Component 2

Type:	Coursework	Weighting:	50%	Outcomes Assessed:	4
Description:	Mini-project involving the development of a microprocessor based system.				

MODULE PERFORMANCE DESCRIPTOR**Explanatory Text**

The module grade is calculated as the weighted average of the component marks. To pass the module the student must achieve a minimum of a grade D and at least 35% in all components.

Module Grade	Minimum Requirements to achieve Module Grade:
A	70% - 100%
B	60% - 69%
C	50% - 59%
D	40% - 49%
E	35% - 39%
F	0% -34%
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 CADY, F.M. and SIBIGTROT, J.M., 2000. Software and Hardware Engineering: Motorola M68HC12. London: Oxford University Press.
- 2 LIPOVSKI, G. J., 2004. Introduction To Microcontrollers: Architecture, Programming, And Interfacing For The Freescale 68HC12. 2nd ed. Academic Press.