

MODULE DESCRIPTOR

Module Title

Embedded Control Design Project

Reference	EN2107	Version	5
Created	April 2023	SCQF Level	SCQF 8
Approved	July 2018	SCQF Points	30
Amended	August 2023	ECTS Points	15

Aims of Module

To provide the student with necessary knowledge, skills and experience to fulfil a simple embedded control brief from concept to fruition.

Learning Outcomes for Module

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

- 1 Infer required documentations for an embedded control application.
- 2 Plan work activities to enable maintainability of the solution and ensure protection of intellectual property.
- 3 Design an embedded controller to a design brief.
- 4 Undertake continuous improvement and its quality management of an embedded controller design.
- 5 Show the performance behaviour of an embedded controller against the original specification document

Indicative Module Content

Introduction to the embedded system, basics of C/C++ language, Hands-on: programming of digital, analogue and serial peripherals of a microcontroller, also interfacing to industrial sensors and implementation of signal processing for control operation. Prototype and development of embedded control system with user interaction.

Module Delivery

The module is delivered in Blended Learning mode using structured online learning materials/activities and directed study, facilitated by regular online tutor support. Workplace Mentor support and work-based learning activities will allow students to contextualise this learning to their own workplace. Face-to-face engagement occurs through annual induction sessions, employer work-site visits, and modular on-campus workshops.

Indicative Student Workload	Full Time	Part Time
Contact Hours	30	N/A
Non-Contact Hours	30	N/A
Placement/Work-Based Learning Experience [Notional] Hours	240	N/A
TOTAL	300	N/A
<i>Actual Placement hours for professional, statutory or regulatory body</i>	240	

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
Description:	Logbook portfolio.				

Component 2

Type:	Coursework	Weighting:	50%	Outcomes Assessed:	3, 4, 5
Description:	Report based on an embedded controller project.				

MODULE PERFORMANCE DESCRIPTOR

Explanatory Text

The module has 2 components and to gain an overall pass a minimum D grade must be achieved in each component. The component weighting is as follows: C1 is worth 50% and C2 is worth 50%.

		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	Completion of Stage 1, SCQF Level 7, or equivalent.
Corequisites for module	None.
Precluded Modules	None.

INDICATIVE BIBLIOGRAPHY

- 1 MORTON, T D, 2000, Embedded Microcontrollers, Prentice-Hall
- 2 WHITE, E, 2012, Making Embedded Systems, DawsonEra (e-book)
- 3 ZHANG, P, 2010, Advanced Industrial Control Technology, 1st ed., Elsevier (e-book)