MODULE SPECIFICATION

Part 1: Information			
Module Title	C Programming		
Module Code	UFMFN7-15-1	Level	Level 4
For implementation from	2018-19		
UWE Credit Rating	15	ECTS Credit Rating	7.5
Faculty	Faculty of Environment & Technology	Field	Engineering, Design and Mathematics
Department	FET Dept of Engin Design & Mathematics		
Contributes towards	Electronic Engineering [Sep][SW][Frenchay][5yrs] MEng 2018-19 Robotics [Sep][SW][Frenchay][4yrs] BEng (Hons) 2018-19 Electrical and Electronic Engineering [Sep][SW][Northshore][5yrs] MEng 2018-19 Robotics [Sep][FT][Frenchay][3yrs] BEng (Hons) 2018-19 Electrical and Electronic Engineering [Sep][SW][Frenchay][5yrs] MEng 2018-19		
Module type:	Standard		
Pre-requisites	None		
Excluded Combinations	None		
Co- requisites	None		
Module Entry requirements	None		

Part 2: Description
Educational Aims: See Learning Outcomes **Outline Syllabus:** Programming language principles Sequence, selection, iteration

Data structures, pointers

Data-types, data manipulation

Development tools: Compilers, linkers, loaders. Debug tools

Specification and design techniques

Introduction to embedded operating systems

User Interfacing

Hardware, interfacing to the real world: Capturing analogue data. Motors, stepper motors and servos. Digital input/output

Professional and legal issues: Ethics. Intellectual property. Product liability

Standards: IEC61508 MISRA C

Teaching and Learning Methods: Programming is a core component in the development of embedded and autonomous systems. This module will provide students with fundamental programming concepts and also the principles of elementary procedural programming based on the C Programming language. The C Programming (UFMFN7-15-1) module will introduce and develop the practical and professional skills for designing and implementing C programs for a wide variety of applications, with emphasis on embedded systems.

This will be delivered though a set of lectures and structured laboratory exercises. Students will start from "step by step" laboratory exercises and progress to problem based learning culminating in design and implementation of a complete system. Accompanying lectures and tutorial sessions will present the formal aspects of the module. Laboratory exercises will also introduce the student to the tools and techniques required for the implementation and verification of an embedded system.

Part 3: Assessment

The strategy will be based on individual exercises, logbooks, reports and demonstrations to develop and assess their understanding of C-programming concepts through problem based exercises. The different components assessed are:

Component A: Final summative assessment will be an online examination on the DEWIS assessment platform. The examination will assess the students' awareness of professional and legal issues relating to the use of C within embedded systems along with their understanding of design principles.

Component B: Summative assessment is achieved through the demonstration of an embedded programme together with the submission of a report showing the development process (B2) and a digital logbook of C-Programming exercises (B1).

Resit Assessment Strategy: Students will be required to submit a report showing the development process of an embedded programme (designed for the resit) together with a demonstration of the final product.

Formative assessments will be used to provide oral feedback throughout laboratory sessions particularly with respect to the workshop exercises and logbook entries along with a set of DEWIS exercises for additional formative feedback purposes.

The online examination will be of 2 hours duration.

First Sit Components	**Final Assessment**	**Element weighting**	**Description**
Set Exercise - Component B		37 %	Digital logbook entries of C-programming exercises
Report - Component B		38 %	Report showing development process of an embedded programming exercise and demonstration of final product
Examination - Component A	✓	25 %	Online examination
Resit Components	**Final Assessment**	**Element weighting**	**Description**
Report - Component B		75 %	Report showing development process of an embedded programming exercise and demonstration of final product
Examination - Component A	✓	25 %	Online examination

Part 4: Teaching and Learning Methods

Learning Outcomes

On successful completion of this module students will be able to:

	Module Learning Outcomes
MO1	Develop a good understanding of engineering principles and needs to apply a system approach for the design and development of embedded software development
MO2	Demonstrate an understanding of appropriate codes of practice and industry standards in relation to software development
MO3	Develop an understanding of programming fundamentals through the design of simple control programmes and appropriate use of verification tools and techniques
MO4	Demonstrate understanding and use of technical literature and other information sources

Contact Hours

Contact Hours	
Independent Study Hours:	
Independent study/self-guided study	46
Total Independent Study Hours:	46
Placement Study Hours:	
Placement	56

	Total Placement Study Hours:	56
	Scheduled Learning and Teaching Hours:	
	Face-to-face learning	48
	Total Scheduled Learning and Teaching Hours:	48
	Hours to be allocated	150
	Allocated Hours	150
Reading List	*The reading list for this module can be accessed via the following link:* https://uwe.rl.talis.com/modules/ufmfn7-15-1.html	