MODULE SPECIFICATION

Part 1: Information			
Module Title	Secure Embedded Systems		
Module Code	UFCFDL-15-2	Level	Level 5
For implementation from	2020-21		
UWE Credit Rating	15	ECTS Credit Rating	7.5
Faculty	Faculty of Environment & Technology	Field	Computer Science and Creative Technologies
Department	FET Dept of Computer Sci & Creative Tech		
Module type:	Standard		
Pre-requisites	Computer and Network Systems 2020-21		
Excluded Combinations	None		
Co- requisites	None		
Module Entry requirements	None		

Part 2: Description

Overview: Pre-requisites: students must take one out of UFCFF6-30-1 Programming in C or UFCFGL-30-1 Programming in C++ or UFCF93-30-1 Computer and Network Systems

Educational Aims: See Learning Outcomes

Outline Syllabus: In this module you will cover the following areas:

History of mobile devices.

Architecture of low powered mobile systems, exemplified by the ARM - Cortex-M3 processor.

The nature of security in embedded and network systems Cross development and cross compilation

Booting embedded systems JTAG - controlling dead or locked systems, recovering data - system initialization, security implications Memory technologies at the device level - Flash, SD

Networking technologies - wired and wireless

Configuring, building and booting embedded OS

File systems for embedded systems on a range of devices

Open source development methodologies. Working in OS communities, responsibilities, professionalism and legal implications.

Power saving features of mobile and embedded systems: Booting, suspending, sleeping and hibernating

Teaching and Learning Methods: Laboratory exercises will allow the student to gain familiarization with the tools and techniques required for the implementation and verification of safe embedded systems.

Students will be expected to demonstrate self-direction and originality in their learning which will be facilitated through student directed tutorials.

Scheduled learning in the form of tutorials, demonstrations and practical classes, will comprise 1/3 of the total study time for this module.

The lecture series will be supported by weekly practical sessions in which the students have the opportunity to apply some of the concepts discussed during the lecture series.

The practicals will allow the students to explore and debug mobile devices and/or device simulations using a range of tools.

Independent learning: will constitute the remaining study time with an expectation that approximately 36 hours will be spent on self-directed study, a further 40 hours in support of the coursework and 16 hours in exam preparation.

Part 3: Assessment

Formative assessment is achieved through the demonstration and discussion of their solutions to the graded problems in the worksheets. The sign off sheet will be handed in as evidence of their work.

Students will also be assessed in their effective use and understanding of the tools and technologies that they utilise.

For the referral coursework it is likely that the student will be required to provide evidence of their achievements on the practical worksheets rather than an in person demonstration.

First Sit Components	**Final Assessment**	**Element weighting**	**Description**
Practical Skills Assessment - Component B		50 %	Signed off and demonstrated practical worksheets
Examination (Online) - Component A	✓	50 %	Online Examination (2 hours) 24 hour window
Resit Components	**Final Assessment**	**Element weighting**	**Description**
Practical Skills Assessment - Component B		50 %	Evidence of completed practical worksheets
Examination (Online) - Component A	✓	50 %	Online written Examination (2 hours) 24 hour window

Part 4: Teaching and Learning Methods

Learning Outcomes

On successful completion of this module students will achieve the following learning outcomes:

Module Learning Outcomes	Reference
Understand the characteristics of secure, low-powered mobile and embedded technology	MO1
Analyse and manipulate higher-level software architectures, file systems and memory	MO2
Develop software for mobile and embedded devices for a range of purposes	MO3
Explore booting and system initialization in a range of devices	MO4
Appraise the role of device drivers in mobile embedded systems	MO5

Contact Hours

Independent Study Hours:	
Independent study/self-guided study	114
Total Independent Study Hours:	114
Scheduled Learning and Teaching Hours:	
Face-to-face learning	36
Total Scheduled Learning and Teaching Hours:	36
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/index.html

Part 5: Contributes Towards

This module contributes towards the following programmes of study:

Forensic Computing and Security {Foundation} [Sep][SW][Frenchay][5yrs] BSc (Hons) 2018-19

Forensic Computing and Security {Foundation} [Sep][FT][Frenchay][4yrs] BSc (Hons) 2018-19