



MODULE SPECIFICATION

Part 1: Information			
Module Title	Mobile and Embedded Devices		
Module Code	UFCFW5-30-2	Level	Level 5
For implementation from	2019-20		
UWE Credit Rating	30	ECTS Credit Rating	15
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 2019-20		
Excluded Combinations	None		
Co- requisites	None		
Module Entry requirements	None		

Part 2: Description
<p>Overview: Pre-requisites: students must take one out of UFCF93-30-1 Computer and Network Systems or UFCFGL-30-1 Programming in C++</p> <p>Educational Aims: See Learning Outcomes.</p> <p>In addition, the educational experience may explore, develop, and practise but not formally discretely assess the following:</p> <p>Working as a member of a team.</p> <p>Outline Syllabus: The syllabus includes: History of mobile devices. Architecture of low powered mobile system, exemplified by the ARM-Cortex-M3 processor. Advanced architectures, exemplified by ARM-Cortex A9 The nature of security in embedded and network systems Cross development and cross compilation Booting embedded systems JTAG - controlling dead or locked systems - system initialisation, security implications Memory technologies at the device level - Flash, SD Networking technologies - wired and wireless</p>

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Configuring and building 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.
Embedded OS - Linux kernel programming, Linux kernel modules, security concerns
Embedded OS – Android: architecture, programming, security concerns
Reliability of mobile data – jamming devices
File Systems - secure and journaling file systems
Power saving features of mobile and embedded systems: Booting, suspending, sleeping and hibernating
Mobile wireless technology: Wireless and GPS.

Teaching and Learning Methods: For the most part the course will be delivered through practicals and lectures. The theoretical content will be covered in lectures. In the practical sessions students will gain understanding through designing, implementing, analysing and investigating mobile systems and/or simulations of mobile systems. Students will be expected to work in groups and, as part of the learning process, to present their work to their peers. The practical sessions will be delivered in such a way that the student is able to focus on activities that most closely align with their degree programme.

The module delivering will therefore include:
Scheduled learning - lectures, demonstrations, practical classes and workshops;

Independent learning includes hours engaged with essential reading, case study preparation, assignment preparation and completion etc.

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.

Contact Hours:

This module will involve 6 hours contact time per fortnight. The time will be divided between lecture sessions and laboratory sessions.

Module contact time = 72 hours

Over the course of the academic year students should expect to spend approximately:

Activity

Contact time: 72 hours

Assimilation and development of knowledge: 148 hours

Exam preparation: 40 hours

Coursework preparation: 40 hours

Total study time: 300 hours

Part 3: Assessment

In common with many modules that form part of a computing degree, this module aims to equip students with a theoretical understanding that will underpin their mastery of a set of practical skills. In this way, students will be able to extend their practical skills, transfer them to alternative tools and reflect on problems that arise as those skills are applied. The assessment strategy reflects this overarching aim in that students are assessed by examinations and by a piece of practical work.

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First Sit Components	Final Assessment	Element weighting	Description
Practical Skills Assessment - Component B		25 %	Group practical work 1
Practical Skills Assessment - Component B		25 %	Group practical work 2
Examination - Component A		25 %	Examination (2 hours)
Examination - Component A	✓	25 %	Examination (2 hours)
Resit Components	Final Assessment	Element weighting	Description
Professional Practice Report - Component B		50 %	Practical development and software and supporting documentation
Examination - Component A	✓	50 %	Examination (2 hours)

Part 4: Teaching and Learning Methods																	
Learning Outcomes	<p>On successful completion of this module students will achieve the following learning outcomes:</p> <table border="1"> <thead> <tr> <th>Module Learning Outcomes</th> <th>Reference</th> </tr> </thead> <tbody> <tr> <td>Understand the characteristics of memory in low-powered mobile and embedded technology</td> <td>MO1</td> </tr> <tr> <td>Analyse and manipulate higher-level software architectures, file systems and memory</td> <td>MO2</td> </tr> <tr> <td>Develop software for mobile and embedded devices for a range of purposes</td> <td>MO3</td> </tr> <tr> <td>Explore booting and system initialisation in a range of devices</td> <td>MO4</td> </tr> <tr> <td>Appraise the role of device drivers in mobile and embedded systems</td> <td>MO5</td> </tr> </tbody> </table>	Module Learning Outcomes	Reference	Understand the characteristics of memory in 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 initialisation in a range of devices	MO4	Appraise the role of device drivers in mobile and embedded systems	MO5				
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Reading List	<p><i>The reading list for this module can be accessed via the following link:</i></p> <p>https://uwe.rl.talis.com/modules/ufcfw5-30-2.html</p>
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Part 5: Contributes Towards

This module contributes towards the following programmes of study:

Electronic and Computer Engineering [Sep][FT][Frenchay][3yrs] BEng (Hons) 2018-19

Electronic and Computer Engineering [Sep][SW][Frenchay][4yrs] BEng (Hons) 2018-19

Electronic and Computer Engineering {Top Up} [Aug][FT][SHAPE][1yr] BEng (Hons) 2018-19

Electronic and Computer Engineering {Top Up} [Aug][PT][SHAPE][2yrs] BEng (Hons) 2018-19

Electronic and Computer Engineering [Sep][PT][GlosColl][5yrs] BEng (Hons) 2018-19

Electronic and Computer Engineering {Apprenticeship} [Sep][PT][GlosColl][5yrs] BEng (Hons) 2018-19