



MODULE SPECIFICATION

Part 1: Information			
Module Title	Advanced Systems Programming		
Module Code	UFCFWR-15-3	Level	Level 6
For implementation from	2022-23		
UWE Credit Rating	15	ECTS Credit Rating	7.5
Faculty	Faculty of Environment & Technology	Field	
Department	FET Dept of Computer Sci & Creative Tech		
Contributes towards	Computer Science BSc (Hons) 2020-21		
Module type:	Standard		
Pre-requisites	Systems Development Group Project 2021-22		
Excluded Combinations	None		
Co- requisites	None		
Module Entry requirements	None		

Part 2: Description
<p>Computing has changed so much in the last decade that desktop computer become largely irrelevant. Instead heterogeneous, multicore, mobile, and real-time systems - smart mobile phones, netbooks, and laptops - are now ubiquitous. With all this we might have expected a move away from programming in C.</p> <p>This course will introduce the student to modern system development and operating systems that ease the challenges of systems programming.</p> <p>Educational Aims: This module aims to advance the students' understanding of programming concepts, in particular systems programming, with application to a wide set of applications, including embedded systems, games and audio programming, and high performance computing.</p>

STUDENT AND ACADEMIC SERVICES

Outline Syllabus: This module looks at the features offered by modern C++ and Mozilla's Rust programming language. Emphasis will be placed on system correctness and secure programming, to ensure the resulting systems are safe to use in an adversarial environment.

Teaching and Learning Methods: Laboratory exercises will allow students to gain familiarisation 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.

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.

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.

Through the use of practical work students will also be assessed in their effective use and understanding of the tools and technologies that they utilize.

For the referral coursework 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 %	Small group project with demonstration and signoff.
Portfolio - Component A		50 %	Practical coursework examination with regular sign-offs
Resit Components	Final Assessment	Element weighting	Description
Practical Skills Assessment - Component B	✓	50 %	Regular assessment of project progress and signoff.
Portfolio - Component A		50 %	Evidence of completed practical worksheets.

Part 4: Teaching and Learning Methods

Learning Outcomes	On successful completion of this module students will be able to:	
		Module Learning Outcomes
	MO1	Develop modern low-level system programs using an appropriate programming language; (A/B)
	MO2	To discuss the challenges of secure low-level programming and write secure code in a modern systems programming language to perform systems programming. (A/B)

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	MO3	Critically review and demonstrate the advantages and disadvantages of integrating automatic memory management with the operating system/runtime; (B)
	MO4	Review and evaluate the role of different system programming languages, such as C, C++, and Rust. (B)
Contact Hours	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	<p><i>The reading list for this module can be accessed via the following link:</i></p> <p>https://eur01.safelinks.protection.outlook.com/?url=https%3A%2F%2Frl.talis.com%2F3%2Fuwe%2Flists%2FED9BB685-9800-1F2F-B8DD-38959339BBA2.html%3Flang%3Den-GB%26login%3D1&data=02%7C01%7CElias.Pimenidis%40uwe.ac.uk%7Ccd913533534e403ebc0908d7afb4b1ad%7C07ef1208413c4b5e9cdd64ef305754f0%7C0%7C637171062922471397&sdata=iQ%2B5V%2FCyLvLZntFB%2Fg37%2BI4Mt97UaKWfG92tOp%2F8AbU%3D&reserved=0</p>	