

University of the West of Scotland

Module Descriptor

Session: 2024/25

Title of Module: Systems Programming Concepts			
Code: COMP09111	SCQF Level: 9 (Scottish Credit and Qualifications Framework)	Credit Points: 20	ECTS: 10 (European Credit Transfer Scheme)
School:	School of Computing, Engineering and Physical Sciences		
Module Co-ordinator:	Stephen Devine		
Summary of Module			
<p>The aim of the module is to provide students with an understanding of the main concepts associated with device control and data acquisition together with the chance to develop further programming skills.</p> <p>Students will be introduced to practical issues associated with hardware and operating systems. This will include topics such as advanced data structures, command line programming, inter process communications and other techniques required to manage and control current networked hosts and devices.</p> <p>Students studying this module will have the opportunity to discover both physical computing and programming concepts, and will include the use of Micro controllers, and several types of sensors, such as light, temperature, humidity and sound.</p> <p>This module will work to develop a number of the key 'I am UWS' Graduate Attributes to make those who complete this module:</p> <p>Universal Critical Thinker Ethically-minded Research-minded</p> <p>Work Ready Problem-Solver Effective Communicator</p> <p>Ambitious Successful Autonomous Resilient Driven</p>			

Module Delivery Method					
Face-To-Face	Blended	Fully Online	HybridC	Hybrid 0	Work-Based Learning
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
See Guidance Note for details.					

Campus(es) for Module Delivery						
The module will normally be offered on the following campuses / or by Distance/Online Learning: (Provided viable student numbers permit) (tick as appropriate)						
Paisley:	Ayr:	Dumfries:	Lanarkshire:	London:	Distance/Online Learning:	Other:
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	D&G and NCL

Term(s) for Module Delivery					
(Provided viable student numbers permit).					
Term 1		Term 2		Term 3	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Learning Outcomes: (maximum of 5 statements) These should take cognisance of the SCQF level descriptors and be at the appropriate level for the module. At the end of this module the student will be able to:	
L1	Demonstrate a critical understanding of systems programming within Linux, Windows and micro-controllers
L2	Critical understanding of programming language constructs in developing interactive programs, that take inputs from sensors and control a variety of physical outputs such as LEDs and Servos.
L3	Critically reflect on alternative system programming techniques to provide solutions to complex network or operating systems problems.
Employability Skills and Personal Development Planning (PDP) Skills	
SCQF Headings	During completion of this module, there will be an opportunity to achieve core skills in:
Knowledge and Understanding (K and U)	SCQF Level 9 Knowledge and understanding of the scope and defining features of systems programming, and an integrated knowledge

	of its main areas and boundaries. A critical understanding of the principles, principal theories, concepts and terminology associated with systems programming.	
Practice: Applied Knowledge and Understanding	SCQF Level 9 Use the principle skills, techniques and practices related to systems programming. Practise routine methods of enquiry to practise in a range of contexts that include a degree of unpredictability.	
Generic Cognitive skills	SCQF Level 9 Undertake critical analysis, evaluation and/or synthesis of ideas, concepts, information and issues in systems programming. Identify and analyse routine professional problems and issues. Draw on a range of sources in making judgements.	
Communication, ICT and Numeracy Skills	SCQF Level 9 Use a wide range of skills in support of established practices; Present or convey, formally and informally, information about topics to informed audiences; Interpret, use and evaluate data.	
Autonomy, Accountability and Working with others	SCQF Level 9 Exercise autonomy and initiative in activities. Manage complex ethical and professional issues in accordance with ethical codes or practices.	
Pre-requisites:	Before undertaking this module the student should have undertaken the following:	
	Module Code: COMP07027 COMP08074	Module Title: Introduction to Programming Operating Systems
	Other:	
Co-requisites	Module Code:	Module Title:

*Indicates that module descriptor is not published.

Learning and Teaching	
In line with current learning and teaching principles, a 20-credit module includes 200 learning hours, normally including a minimum of 36 contact hours and maximum of 48 contact hours.	
Learning Activities During completion of this module, the learning activities undertaken to achieve the module learning outcomes are stated below:	Student Learning Hours (Normally totalling 200 hours): (Note: Learning hours include both contact hours

	and hours spent on other learning activities)
Lecture/Core Content Delivery	12
Tutorial/Synchronous Support Activity	12
Laboratory/Practical Demonstration/Workshop	24
Independent Study	152
	200 Hours Total

****Indicative Resources: (eg. Core text, journals, internet access)**

The following materials form essential underpinning for the module content and ultimately for the learning outcomes:

Blum, J. (2013) Exploring Arduino. Wiley. ISBN-10: 1118549368, ISBN-13: 978-1118549360

Kerrisk, M (2010) The Linux Programming Interface: A Linux and UNIX System Programming Handbook. ISBN-13: 978-1-59327-220-3

Mazidi, M et al (2019) Arduino Programming From Beginning to Advanced. MicroDigitalEd. ISBN-10:1970054204, ISBN-13: 978-1970054200

Please ensure the list is kept short and current. Essential resources should be included, broader resources should be kept for module handbooks / Aula VLE.

Resources should be listed in Right Harvard referencing style or agreed professional body deviation and in alphabetical order.

(*N.B. Although reading lists should include current publications, students are advised (particularly for material marked with an asterisk*) to wait until the start of session for confirmation of the most up-to-date material)

Attendance and Engagement Requirements

In line with the [Student Attendance and Engagement Procedure](#): Students are academically engaged if they are regularly attending and participating in timetabled on-campus and online teaching sessions, asynchronous online learning activities, course-related learning resources, and complete assessments and submit these on time.

Equality and Diversity

The University's Equality, Diversity and Human Rights Procedure can be accessed at the following link: [UWS Equality, Diversity and Human Rights Code](#).

(N.B. Every effort will be made by the University to accommodate any equality and diversity issues brought to the attention of the School)

Supplemental Information

Divisional Programme Board	Computing
Assessment Results (Pass/Fail)	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
School Assessment Board	Business & Applied Computing
Moderator	Paul Keir
External Examiner	H Al-Khateeb
Accreditation Details	e.g. ACCA Click or tap here to enter text.
Changes/Version Number	1.03

Assessment: (also refer to Assessment Outcomes Grids below)

This section should make transparent what assessment categories form part of this module (stating what % contributes to the final mark).

Maximum of 3 main assessment categories can be identified (which may comprise smaller elements of assessment).

NB: The 30% aggregate regulation (Reg. 3.9) (40% for PG) for each main category must be taken into account. When using PSMD, if all assessments are recorded in the one box, only one assessment grid will show and the 30% (40% at PG) aggregate regulation will not stand. For the aggregate regulation to stand, each component of assessment must be captured in a separate box.

Please provide brief information about the overall approach to assessment that is taken within the module. In order to be flexible with assessment delivery, be brief, but do state assessment type (e.g. written assignment rather than “essay” / presentation, etc) and keep the detail for the module handbook. [Click or tap here to enter text.](#)

Assessment 1 – Practical Assignment: Create a combined hardware and software solution to a given task.

Assessment 2 – Practical & Written Assignment: Carry out specified laboratory tasks and maintain laboratory notes.

Assessment 3 – Written Assignment: Analyse a case study and produce a written solution.

(N.B. (i) **Assessment Outcomes Grids** for the module (one for each component) can be found below which clearly demonstrate how the learning outcomes of the module will be assessed.

(ii) An **indicative schedule** listing approximate times within the academic calendar when assessment is likely to feature will be provided within the Student Module Handbook.)

Assessment Outcome Grids (See Guidance Note)

Component 1							
Assessment Type (Footnote B.)	Learning Outcome (1)	Learning Outcome (2)	Learning Outcome (3)	Learning Outcome (4)	Learning Outcome (5)	Weighting (%) of Assessment Element	Timetabled Contact Hours
Case study	✓	✓	✓			70	4

Component 2							
Assessment Type (Footnote B.)	Learning Outcome (1)	Learning Outcome (2)	Learning Outcome (3)	Learning Outcome (4)	Learning Outcome (5)	Weighting (%) of Assessment Element	Timetabled Contact Hours
Lab tasks	✓	✓	✓			15	8

Component 3							
Assessment Type (Footnote B.)	Learning Outcome (1)	Learning Outcome (2)	Learning Outcome (3)	Learning Outcome (4)	Learning Outcome (5)	Weighting (%) of Assessment Element	Timetabled Contact Hours
Lab notes	✓	✓	✓			15	4
Combined Total for All Components						100%	16 hours