MODULE SPECIFICATION

Part 1: Information			
Module Title	Computer Networks and Operating Systems		
Module Code	UFCFQ4-30-2	Level	Level 5
For implementation from	2018-19		
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		
Contributes towards			
Module type:	Standard		
Pre-requisites	Computer and Network Systems 2018-19, Introduction to OO Systems Development 2018-19, Programming in C 2018-19		
Excluded Combinations	None		
Co- requisites	None		
Module Entry requirements	None		

Part 2: Description

Overview: Pre-requisites: students must take UFCF93-30-1 Computer and Network Systems and UFCFF6-30-1 Programming in C or UFCFC3-30-1 Introduction to OO Systems Development.

Educational Aims: See Learning Outcomes

Outline Syllabus: Operating Systems:
Operating System Organisation models and structures

History and implications of using Open Source code in operating systems. Licensing issues and their legal implications.

Process and Object Management kernel services, interrupt handlers, scheduling.

Inter-process Communication event handling, message passing, synchronous-asynchronous, shared memory.

Concurrency and Synchronisation semaphores, critical regions, monitors, message passing, multi-threaded processes.

Memory Management Organisation algorithms and policies, Virtual Memory Management.

I/O Management Device driver design, Buffering and interrupt handling.

File and Persistent Object Management File organisation, directories and naming, index nodes, disk block management. Network and distributed file systems. Protection and Security Models for secure computing, access control, capability based systems, access control lists.

Virtualisation. History of VMs. Variety of virtualisation – full, partial, para. Emulators, simulators and virtualisation. VM in languages – Java VM.

Embedded and mobile OS. Background to embedded and mobile os. Hardware and software requirements for embedded/mobile. Embedded/mobile OS.

Networked Systems:
Computer network architecture\'s and models. Layered models, peer protocols, the ISO OSI model.

Protocol Specification and Design Specification techniques -FSM, layered protocols, error correction Connection vs connectionless protocols.

Medium Access Control Protocols MAC techniques.

Subnetworks and Internetworks network layer design, routing and switching, addressing and naming network topology.

Transport Services TLIs.

Network and Distributed Systems Management Security issues, fault, monitoring and accounting issues.

TCP/IP protocols IP layer, ICMP, ARP TCP socket programming Applications IPV4 and IPng Administering a TCP IP network.

System Administration Specifying and installing an OS and network Initialise the system for user and applications Install devices, software packages and communication links. Making the system secure, investigation of security strategies Instigation of system maintenance - backup, user control Document system and system modifications

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

Over the course of the academic year students should expect to spend approximately:
Contact time: 72 hours
Assimilation and development of knowledge: 148 hours
Exam preparation: 40 hours
Coursework preparation: 40 hours
Total study time: 300 hours

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 and implementing system software components. For the systems administration part of the course the students will be divided into groups and be required to configure and manage a computer system and offer this computing service to an acceptable professional standard to the rest of the cohort.

An extended case-study, supported by focussed tutorials and practicals, will allow the students to follow through an example application from design to implementation, and appreciate the relevance of all the component parts of the module syllabus. Examples of case studies could be:

creating a VPN (virtual private network) within the existing network, implementing a firewall/bastion host/proxy security strategy within the network, full automate the user account administration of the system.

Part 3: Assessment

The students will be assessed through a mix of assessed practical worksheets, set assignment tasks and examinations. The worksheets are designed to ensure sustained student engagement whilst the assignment tasks allow the student to demonstrate their mastery of a number of practical skills. The final coursework requires the consolidation of the complete module material.

The more theoretical aspects of the course are assessed in the exam. There is an exam at the end of each teaching block. Two exams are used as experience suggests that the material and concepts covered by this module are most successfully examined in relatively small chunks.

First Sit Components	**Final Assessment**	**Element weighting**	**Description**
Set Exercise - Component B		25 %	Weekly worksheets, signed off on a regular basis by the lab tutor
Report - Component B		25 %	Practical coursework
Examination - Component A		25 %	Exam 1 (2 hours)
Examination - Component A	✓	25 %	Exam 2 (2 hours)
Resit Components	**Final Assessment**	**Element weighting**	**Description**
Report - Component B		50 %	Coursework - report on practical work carried out (demonstrated where appropriate)
Examination - Component A	✓	50 %	Exam (3 hours)

Part 4: Teaching and Learning Methods

Learning Outcomes

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

	Module Learning Outcomes
MO1	Show a detailed knowledge and understanding of the design, structure and implementation of modern networked operating systems (NOS) as well as the data structures and interfaces of a NOS
MO2	Write small utility programs, in both script and compiler level languages, that interface to the system primitives
MO3	Build, install, boot, administer and manage a NOS and manage the users on the system
MO4	Understand the networking protocols that underpin the operation of a NOS
MO5	Understand the security problems and solutions on a network

Contact Hours

Contact Hours	
Independent Study Hours:	
Independent study/self-guided study	228
Total Independent Study Hours:	228
Scheduled Learning and Teaching Hours:	
Face-to-face learning	72
Total Scheduled Learning and Teaching Hours:	72
Hours to be allocated	300
Allocated Hours	300

Reading List

The reading list for this module can be accessed via the following link:

https://uwe.rl.talis.com/modules/ufcfq4-30-2.html