

ISCG5401: Operating System Fundamentals

Course number:	ISCG5401	Level:	5	Credits:	15
Main programme:	BCS	Delivery:		Hours directed:	52
Pathway:		Hours self-directed:		Total hours:	150
Other programmes:		Number of weeks:			16 weeks
Prerequisites:					
Co-requisites:					
Restrictions:					
Other:					

Students are expected to adhere to Unitec's policy on conduct in respect of staff, fellow students, and in the use of resources and facilities. Students are required to attend 100% of all scheduled classes.

NZQA Level Descriptor:

	Knowledge	Skills	Application
5	The student has broad operational or technical and theoretical knowledge within a specific field of work or study and selects and applies ...	<ul style="list-style-type: none"> a range of solutions to familiar and sometimes unfamiliar problems, a range of standard and non-standard processes relevant to the field of work or study with ... 	<ul style="list-style-type: none"> complete self-management of learning and performance within defined contexts, some responsibility for the management of learning and performance of others.

Course aim:

The aim of this course is to provide students the understanding fundamental concepts of operating systems (OS), functionalities and architectures of operating systems, and how they are designed to meet requirements from users, hardware, and software. Students will gain hands-on experience on using MS Windows and Linux system commands and programs to explore various topics covered by the course.

Learning Outcomes:

1. Demonstrate knowledge of operating system concepts and structures, and processes and inter-process communications
2. Demonstrate knowledge of memory management, I/O management, file systems, and user management and security.
3. Use system commands and programs to monitor and manage processes and system resources
4. Use system commands and programs to manage files, users, and access controls

Topics:

- - Course structure and assessments, History of OS, Types of OS
- *OS Concepts and Structure* - Operating System Services, User Operating System Interface, System Calls and Programs, Operating System Structure
- *Processes and Process scheduling* - Process model, creating, and states, Threads model, Multi-threading model, Process and CPU scheduling
- *Inter-process communication* - Inter-process communication (IPC) concepts, Classical IPC problems, Synchronization/ Deadlocks, Client-Server Communication
- *Memory management* - Logical and Physical address spaces, Memory Swapping, Allocation, Paging and Segmentation, Virtual memory (VM)
- *Storage management* - Storage structure and File & Directory systems, File permission and access controls
- *I/O Systems* – I/O Hardware and I/O Software
- *Security and User management* - Security environments, Protection mechanisms, Authentication, User management, Malware and defence systems