OTAGO POLYTECHNIC Te Kura Matatini ki Otago	*Bachelor of Information Technology*

COURSE DIRECTIVE

IN616 Operating Systems Concepts

Semester 1, 2020

DESCRIPTION

The aim of this course will be to introduce basic system administration using Linux. It starts with a brief discussion on core operating system concepts and gradually delves into Linux internals through mastering the shell commands along with scripts. At the end of the course, students will be able to understand how to navigate, configure, and manage Linux systems for basic system administration. This course lays a solid foundation for more advanced courses in system administration, virtualization and security.

COURSE INFORMATION

Credits 15 credits
Prerequisites IN510 (Programming 1), IN520 (PC Maintenance)

LECTURER

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COURSE DATES

Term 1 (8 weeks)	17 February – 09 April
Mid semester break	14 April – 24 April
Term 2 (8 weeks)	28 April – 19 June

LEARNING OUTCOMES

At the successful completion of this course, students will be able to:

1. Identify the key components of operating systems
2. Interpret process, memory and network management
3. Develop shell scripts to automate user account creation and permission settings
4. Execute basic system administration tasks

INDICATIVE CONTENT

1. Core operating system concepts: scheduling, memory management, process management
2. Operating system design aspects: monolithic vs microkernel, case study of Linux.
3. Linux shell commands and exploring system internals with shell
4. User, process, file and memory management with Linux commands
5. Customizing Linux Kernel and loadable kernel modules
6. Process/Thread management and synchronization
7. Services and Daemons, networking interface
8. Bash Scripting
9. Basic System Administration tasks with scripting
10. File systems
11. Networking with Linux Systems

ASSESSMENT

Assessment Activity	Weighting	Learning Outcomes
Assignment (Programming 20%, Seminar 10%)	30%	2, 3
Class exercises (SBA 15%, Lab 15%, Quiz 10%)	40%	1, 3, 4
Exam	30%	All

SCHEDULE *(TENTATIVE, SUBJECT TO CHANGE)*

Week	Date	Topic	Assessment
1	17 Feb	Introduction to UNIX/Linux; BASH Overview and Commands, OS Architectures	
2	24 Feb	Windows Internals, Process management	
3	2 Mar	Users, groups, permissions, Searching using globbing and regular expressions	
4	9 Mar	Introduction to vim; Package management; Linux Boot process,	
5	16 Mar	SBA; BASH scripting 1	Skills Based Assessment (in class), Scripting Assignment (given)
6	24 Mar	BASH scripting 2; Backup	
7	30 Mar	Bash Scripting 3	
8	6 Apr	Inter process communication, Threads, System Calls	vi Quiz (in class)
Midterm Break			
9	28 Apr	Task scheduling; Partitioning, formatting and mounting,	
10	4 May	BASH scripting assessment session; Compiling the kernel	Scripting Assignment (due)
11	11 May	Networking 1; PPT session	Lab (given & due), Presentation (due)
12	18 May	Networking 2; PPT session	Lab (given & due), Presentation (due)
13	25 May	Networking 3; PPT session	Lab (given & due), Presentation (due)
14	2 Jun	Networking 4, Networking 5	Lab (given & due), Presentation (due)
15	8 Jun	Revision	
16	15 Jun	Final Exam	Exam (due)

RESOURCES

Required:

None

Recommended:

Shotts, William (2019) *The Linux command line, Fifth Internet Edition,* http://linuxcommand.org/tlcl.php

Tannenbaum, A. (2007) *Modern Operating Systems*. (4th ed.). Prentice Hall.