Macao Polytechnic Institute

School of Applied Sciences

Bachelor of Science in Computing

Module Outline

Academic Year 2020/2021 Semester 2

Learning Module	Network and System Administration			**Class Code**	COMP225
Pre-requisite(s)	Nil				
Medium of Instruction	English			**Credit**	3
Lecture Hours	45 hrs	**Lab/Practice Hours**	0 hrs	**Total Hours**	45 hrs
Instructor	Dr. K. L. Eddie Law		**E-mail**	eddielaw@ipm.edu.mo	
Office	M509, Main Campus		**Telephone**	8599-3287	

Description

Network and system administrations are increasingly complex and essential fields in the information technology industry. This module aims at building up the knowledge of students in the administration of network environment. Major topics covered in this module are on Linux environment installation, system administration, network services, Internet services, system maintenance, and system security and problem solving.

Learning Outcomes

After completing the learning module, students will be able to:

1. Recognize different important Linux system commands and their usages; (EA1p, EA2p)
2. Identify and recognize principles and importance of network administration in engineering practice; (EA1p, SM2p)
3. Configure and manage network components like DHCP, SSH and Firewalls; (EP2p, EP3p)
4. Operate and manipulate under Linux environment using shell scripts from technical manuals or other information sources; (EP2p, EP4p)
5. Construct and setup a secure network for organizations; (EP1p, EP3p)
6. Identify and recognize the principles of base network protocols; (EA1p, SM2p)
7. Construct and configure different virtual environment of various Linux distributions. (EP2p, EP3p)

Content

1. Introduction to System Administration (3 hours)
   - 1.1 Basic System Administration
   - 1.2 Overview of Linux Systems
2. Linux Installation (3 hours)
   - 2.1 Virtual Machine and Installation
   - 2.2 Linux Startup Process
3. Basic Linux Environment (6 hours)
   - 3.1 Shell Script
   - 3.2 Basic Programming Environment
4. Administration and Management Tasks (4.5 hours)
   - 4.1 User and Group Accounts
   - 4.2 System Backup
   - 4.3 Job Scheduling
   - 4.4 Logging and Reporting
5. TCP/IP Networking (7.5 hours)
   - 5.1 IPv4 and IPv6 Addressing
   - 5.2 Network Configuration
6. DHCP and SSH (3 hours)
   - 6.1 DHCP Configuration
   - 6.2 SSH Configuration
7. Samba Server (3 hours)
   - 7.1 Samba Connection
   - 7.2 File Sharing
8. Secure File Transfer (3 hours)
   - 8.1 sftp and scp Connections
   - 8.2 File Sharing Configuration
9. Firewalls (7.5 hours)
   - 9.1 IP Tables
   - 9.2 Sharing Internet Connection using NAT
   - 9.3 Firewalls
10. Web Server (4.5 hours)
    - 10.1 Web Server Configuration
    - 10.2 Directory Access Control
    - 10.3 Authentication Module

10.4 Secure Socket Layer (SSL/TLS)

10.5 Virtual Hosts

Teaching Method

Lectures, demonstrations and tutorials.

Attendance

Attendance requirements are governed by the "Academic Regulations Governing Bachelor's Degree Programmes of Macao Polytechnic Institute". Students who do not meet the attendance requirements for the module will not be permitted to sit the final or re-sit examination and shall be awarded an 'F' grade.

Assessment

This learning module is graded on a 100 point scale, with 100 being the highest possible score and 50 being the passing score.

	Item	Description	AHEP3 LO	Percentage
1.	Assignments / Classwork	Home / Class-based exercises	EA2p, EP4p	25%
2.	Tests	Knowledge assessement	EA1p, EP1p, EP2p, EP3p	25%
3.	Examinataion	3-hour written examination	EA1p, EA2p, SM2p, EP1p, EP2p	50%
			Total Percentage:	100%

Students with an overall score of less than 35 in the coursework must take the re-sit examination even if the overall score for the module is 50 or above.

Students with a score of less than 35 in the final examination must take the re-sit examination even if the overall score for the module is 50 or above.

Students with an overall final grade of less than 35 are NOT allowed to take the re-sit examination.

Teaching Material

Textbook(s)

1. Mackin, D. (2017). *UNIX and Linux System Administration Handbook* (5th edition). Pearson Education.

Reference

Reference book(s)

1. Both, D. (2020). *Using and Administering Linux: Volume 1 – Zero to SysAdmin: Getting Started*. Apress.
2. Both, D. (2020). *Using and Administering Linux: Volume 2 – Zero to SysAdmin: Advanced Topics*. Apress