Macao Polytechnic Institute

School of Applied Sciences

Bachelor of Science in Computing

Module Outline

Academic Year 2021 / 2022 Semester 1

Learning Module	IP Routing			**Class Code**	COMP404
Pre-requisite(s)	COMP214				
Medium of Instruction	English			**Credit**	3
Lecture Hours	30 hrs	**Lab/Practice Hours**	15 hrs	**Total Hours**	45 hrs
Instructor	Dr. Jacky Tang		**E-mail**	sktang@ipm.edu.mo	
Office	A202a, Chi Un Building, Main Campus		**Telephone**	8599 6491	

Description

This course delivers the concept of IP routing and the associated routing protocols that can be utilized to route within and between autonomous systems. Common routing protocols such as RIP, OSPF, and IGRP will be discussed. Switching network will also be discussed. Topics covered include network devices, router components, router configuration, IOS images, TCP/IP, routing protocols, network troubleshooting, switching, and VLAN. The course will provide hands-on labs using real networking equipment.

Learning Outcomes

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

1. Justify the need of static and dynamic routing in scalable networks; (EA1p, EA4p)
2. Assess different dynamic routing protocols; (EA1p, EA4p)
3. Configure various routing protocols and switch technologies for scalable networks; (EP2p, EP3p)
4. Justify the configuration of a network; (D1p, EP1p)
5. Analyze the network requirements in different scenarios in terms of scalability and performance; (ET4p, EP1p)
6. Design the modern network for different scenarios based on user needs. (D1p, EP8p)

Content

1. Networking Fundamentals (3 hours)
    - 1.1 Networking Fundamentals
    - 1.2 Routing Fundamentals and Subnets
2. Routers technology (6 hours)
    - 2.1 WANs and Routers
    - 2.2 Configuring a Router
    - 2.3 Managing Cisco IOS Software
3. Routing and Routing Protocols (6 hours)
    - 3.1 Distance Vector Routing Protocols
    - 3.2 TCP/IP Suite Error and Control Messages
    - 3.3 Basic Router Troubleshooting
4. Intermediate Routing (9 hours)
    - 4.1 Introduction to Classless Routing
    - 4.2 RIPv2
    - 4.3 Single-Area OSPF
    - 4.4 EIGRP
5. Access Control Lists (6 hours)
    - 5.1 Standard ACL
    - 5.2 Extended ACL
6. Switching Basics (9 hours)
    - 6.1 Switching Concepts
    - 6.2 Spanning-Tree Protocol
    - 6.3 Virtual LANs
    - 6.4 Virtual Trunking Protocol
7. IPv6 Networking (6 hours)
    - 7.1 IPv6 Basics
    - 7.2 IPv6 Routing Configuration
    - 7.3 IPv6 Tunneling Configuration

Teaching Method

Lectures and laboratories

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 and 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.	Project	Home-based project	EP2p, EP3p ET4p, EP1p, EP8p	25%
2.	Test	Knowledge assessment	EA1p, EA4p, D1p	25%
3.	Examination	3-hour written examination	EA1p, EA4p, D1p	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 course 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 course 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(s)

Textbook(s)

There is no official text for this course. Course notes are distributed in the class.

Reference

Reference book(s)

1. Graziani, R. & Johnson, A. (2012). Routing Protocols and Concepts, CCNA Exploration Companion Guide. Cisco Press. ISBN-13: 978-1587132728
2. Lewis, W. (2012). LAN Switching and Wireless, CCNA Exploration Companion. Cisco Press. ISBN-13: 978-1587132735
3. Dye, M., McDonald, R., & Rufi, A. (2012). Network Fundamentals: CCNA Exploration Companion Guide. Cisco Press. ISBN-13: 978-1587133480