CISCO

Introduction

ITP172 – Networking Fundamentals & Project

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Introduction

Module Overview:

- This module incorporates a new approach to teaching networking fundamentals while incorporating critical business and financial skills.

- To equip students for entrepreneurship opportunities in networking business scenarios.

- Students will undertake a project to develop an innovative networking business proposal that requires them to apply their networking, business and financial skills acquired.

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Learning Outcomes

After completing this module, students will be able to:

- Explain the basic characteristics of a network that supports communication.
- Explain network layer protocols and services that support communications across data networks.
- Explain the structure of IP addressing and calculation of subnets in networking.
- Develop a good understanding of the design thinking approach and apply relevant design methods/tools at various stages.
- Plan and execute a project as a team and deliver the solutions according to requirements.

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Topics overview

- Chapter 1 - Exploring the Network
  - Explain how multiple networks are used in everyday life.
  - Explain the basic characteristics and the topologies used in a small- to medium-sized business network.

- Chapter 2 - Configuring a Network Operating System
  - Explain how to access and navigate Cisco IOS.
  - Explain how devices communicate across network media.
  - Configure a host device with an IP address.

- Chapter 3 - Network Protocols and Communications
  - Explain the role of protocols and standards in network communications.
  - Explain how devices on a LAN access resources in a network.

- Chapter 4 - Network Access
  - Describe the purpose and function of the data link layer in preparing communication for transmission on specific media.
  - Describe the basic characteristics of media control methods on LAN topologies.

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Topics overview

- Chapter 5 - Ethernet
  - Describe the operation of the Ethernet sublayers.
  - Describe the purpose and characteristics of the Ethernet MAC address.
  - Describe the purpose of ARP.

- Chapter 6 - Network Layer
  - Explain how network layer protocols and services support communications across data networks.
  - Explain how routers enable end-to-end connectivity in a network.

- Chapter 7 - Transport Layer
  - Describe the purpose of the transport layer in network communication.
  - Describe characteristics of the TCP and UDP protocols, port numbers and their uses.

- Chapter 8 - IP Addressing
  - Describe the structure of an IPv4 address.
  - Compare the characteristics and uses of the unicast, broadcast and multicast IPv4 addresses.
  - Explain the need for IPv6 addressing.

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Topics overview

- Chapter 9 - Subnetting IP Networks
  - Explain why routing is necessary for hosts on different networks to communicate.
  - Given a network and a subnet mask, calculate the number of host addresses available.
  - Describe the benefits of variable length subnet masking (VLSM).

- Chapter 10 - Application Layer
  - Explain the functions of application layer, session layer, and presentation layer.
  - Explain how data is moved across the network, from opening an application to receiving data.

- Chapter 11 - It's a Network
  - Identify the devices and protocols used in a small network.
  - Explain how a small network serves as the basis for larger networks.
  - Describe the need for basic security measures on network devices.

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Topics overview

■ **Project Development**

- Plan and execute a project as a team and deliver the products according to given requirements.
- Develop a good understanding of the Design Thinking approach and apply relevant methods & tools at various stages to design the solution for target users.
- Apply basic business, marketing and financial concepts to develop a business proposal.
- Apply basic networking concepts to develop a network diagram for technology-based businesses.
- Able to articulate the thinking behind the solution while presenting the business proposal and prototype.

Project – The Challenge

1. How might we start up a business, using IT, which can earn 500 thousand dollars in 3 years time?

2. How might we create a Social Enterprise, using IT, which can earn 100 thousand dollars in 3 years time?

Course Materials

- **Materials in the Blackboard web portal**
  learn.nyp.edu.sg/
- **Cisco Materials & Cisco online exams**
  www.netacad.com/
- **Other Online Materials**
  www.lynda.com/

Text Reference:
Introduction to Networks, Companion Guide (Cisco Networking Academy) Mark A. Dye and Allan D. Reid, 2013

Assessments

Component	Individual Effort	Team Effort
Present project ideas		5% (Wk5)
Design Thinking		5% (Wk2-6)
Written Test 1	10% (Wk7)	
Network Design		10% (Wk9)
Business Plan	5%	10% (Wk12)
Cisco Chapter Quiz	5% (Wk2-12)	
Cisco Final Exam	5% (Wk14)	
Written Test 2	15% (Wk14)	
Final Prototype + Website	5%	10% (Wk14)
Final Presentation	5%	10% (Wk15)