COMS 190 - Computer Network Fundamentals Course Outline

Approval Date: 03/11/2021
Effective Date: 08/13/2021

SECTION A

Unique ID Number	CCC000623961
Discipline(s)	Computer Information Systems
Division	Career Education and Workforce Development
Subject Area	Computer Studies
Subject Code	COMS
Course Number	190
Course Title	Computer Network Fundamentals
TOP Code/SAM Code	0708.10 - Computer Systems Networking and Telecommunications* / D - Possible Occupational
Rationale for adding this course to the curriculum	Part of the Information Technology Model Curriculum C-ID ITIS 150
Units	3
Cross List	*N/A*
Typical Course Weeks	18

Total Instructional Hours

	Contact Hours
Lecture	54.00
Lab	0.00
Activity	0.00
Work Experience	0.00
Outside of Class Hours	108.00

Total Contact Hours	54
Total Student Hours	162
Open Entry/Open Exit	No
Maximum Enrollment	30
Grading Option	Letter Grade or P/NP

Distance Education Mode of Instruction	On-Campus
	Hybrid
	Entirely Online

SECTION B
General Education Information:

SECTION C
Course Description

Repeatability May be repeated 0 times

Catalog Description This course will introduce the architecture, structure, functions, components, and models of the Internet and other computer networks. The principles and structure of IP (Internet Protocol) addressing and the fundamentals of Ethernet concepts, media, and operations are introduced to provide a foundation for further study of computer networks. It uses the OSI (Open Systems Interconnection) and TCP (Transmission Control Protocol) layered models to examine the nature and roles of protocols and services at the application, network, data link, and physical layers. This course also prepares students for the CompTIA Network+

Schedule Description

SECTION D
Condition on Enrollment

1a. Prerequisite(s): *None*

1b. Corequisite(s): *None*

1c. Recommended: *None*

1d. Limitation on Enrollment: *None*

SECTION E
Course Outline Information

1. Student Learning Outcomes:

    A. Demonstrate understanding of basic security issues and best practices in network configuration.

2. Course Objectives: Upon completion of this course, the student will be able to:

    A. Identify and use network transmission media.

    B. Identify and use network transmission media.

    C. Demonstrate the ability to install physical connections (cabling and wireless) between networked devices.

    D.

3. Course Content

    A. Network Fundamentals

        a. OSI (Open Systems Interconnection) and TCP/IP (Transmission Control Protocol/Internet Protocol) layered models

        b. IP addressing (IPv4 and IPv6)

        c. Routing and switching

    B. Functions of common networking protocols

        a. DNS (Domain Name System)

        b. FTP (File Transfer Protocol)

        c. email (POP3, IMAP, SMTP,...)

      d. DHCP (Dynamic Host Configuration Protocol)
      e. HTTP (HyperText Transport Protocol)
      f. Telnet, SSH, RDP,...
  C. Network Design
      a. Network topologies (for example: Ring, Star, Client-server)
      b. WAN (Wide Area Networks) technology types and properties
      c. LAN (Local Area Networks) technology types and properties
      d. Planning and implementation of a basic SOHO (Small Office/Home Office) network for a given set of requirements.
      e. Standard media types (for example: Fiber, Copper), associated properties, standard connector types
      f. Wireless standards, protocols and design considerations
  D. Network Configuration
      a. Installation and configuration of routers and switches for a given scenario
      b. Installation and configuration of a wireless network for a given scenario
  E. Network Management, Monitoring and Troubleshooting
      a. Methodology
      b. Hardware and software tools to troubleshoot connectivity issues
      c. Network monitoring resources to analyze traffic
      d. Network performance optimization
  F. Network Security
      a. Wireless Security Measures
      b. Network Access Security Methods
      c. User authentication Methods
      d. Common threats, vulnerabilities, and mitigation techniques
      e. Installation and configuration of a basic firewall
      f. Network Security appliances and methods
      g.

4. Methods of Instruction:

Lecture: Lab assignments include: *Designing network topologies *Implementing a network design *Configuring operating systems *Monitoring network throughput *Inspecting network packets

Online Adaptation: Discussion

1. Methods of Evaluation: Describe the general types of evaluations for this course and provide at least two, specific examples.

Typical classroom assessment techniques

Exams/Tests -- Objective quizzes and exams on: the architecture, structure, functions, components, and models of the Internet and other computer networks; the nature and roles of protocols and services at the application, network, data link, and physical layers; and the principles and structure of IP addressing and the fundamentals of Ethernet concepts, media, and operations

Home Work -- Textbook readings and online supporting webpages to inform the student on the architecture, structure, functions, components, and models of the Internet and other computer networks.

Lab Activities --

Additional assessment information:

Textbook readings and online supporting webpages to inform the student on the architecture, structure, functions, components, and models of the Internet and other computer networks.

Letter Grade or P/NP

2. Assignments: State the general types of assignments for this course under the following categories and provide at least two specific examples for each section.

   A. Reading Assignments
   Daily reading assignments from the textbook(s) and supplementary materials.
   B. Writing Assignments
   Prepare critical analysis reports on networking concepts and issues that could include:

   Network troubleshooting, log analyses and forensic evaluation
   Critical network evaluation against customer requirements.

   Establish network operating procedures.

   Developing addressing and routing plans
   C. Other Assignments
   Assignments include designing and configuring networks conceptually and in practice, and answering questions in preparation for the Network+ certification exam.

3. Required Materials

   A. EXAMPLES of typical college-level textbooks (for degree-applicable courses) or other print materials.
   Book #1:
   Author: Various
   Title: Introduction to Networks
   Publisher: Cisco Press
   Date of Publication: 2017
   Edition: 6

   B. Other required materials/supplies.