COLLEGE OF THE DESERT

Course Code CIS-353A

Course Outline of Record

1. Course Code: CIS-353A
2.   a. Long Course Title: Computer Network Fundamentals I
     b. Short Course Title: IT NETWORKS I
3.   a. Catalog Course Description:

> CompTIA certifications help students build a solid foundation of essential knowledge and skills that will help students earn employment in technology-related careers. The CompTIA Network+ certification assures employers that their applicant is prepared to enter the workforce as a network support technician. Computer network technicians analyze, test, troubleshoot, and evaluate existing network systems, such as local area network (LAN), wide area network (WAN), and Internet systems or a segment of a network system. Perform network maintenance to ensure networks operate correctly with minimal interruption.
>
> Completion of the this course, in conjunction with CIS 353B, prepares students for the CompTIA Network+ N10-006 industry certification exam.

     b. Class Schedule Course Description:

> CompTIA certifications help students build a solid foundation of essential knowledge and skills that will help students earn employment in technology-related careers. The CompTIA Network+ certification assures employers that their applicant is prepared to enter the workforce as a network support technician. Computer network technicians analyze, test, troubleshoot, and evaluate existing network systems, such as local area network (LAN), wide area network (WAN), and Internet systems or a segment of a network system. Perform network maintenance to ensure networks operate correctly with minimal interruption.
>
> Completion of this course, together with CIS 353B, prepares students for the CompTIA Network+ N10-006 industry certification exam.

     c. Semester Cycle (*if applicable*): *N/A*
     d. Name of Approved Program(s):
          • NETWORK+ PREPARATORY Certificate of Completion
4. Total Units: 0   Total Semester Hrs: 27.00
   Lecture Units: 0   Semester Lecture Hrs: 27.00
   Lab Units: 0   Semester Lab Hrs: 0
     Class Size Maximum: 32   Allow Audit: No
     Repeatability Noncredit - Unlimited
     Justification 0
5. Prerequisite or Corequisite Courses or Advisories:
Course with requisite(s) and/or advisory is required to complete Content Review Matrix (CCForm1-A)
N/A
6. Textbooks, Required Reading or Software: *(List in APA or MLA format.)*
     a. Meyers, Mike (2015). *CompTIA Network+ All-In-One Exam Guide* (6th/e). McGraw Hill. ISBN: 9780071848220
        College Level: Yes
        Flesch-Kincaid reading level: 12
7. Entrance Skills: *Before entering the course students must be able:*

8. Course Content and Scope:

CIS 353A-Computer Network Fundamentals I

Lecture:

1. OSI (Open Systems Interconnection)
    1. How the layers prepares network packets for transmission.
    2. Description of the encapsulation protocols and processes.
    3. Network layer routing.
2. TCP/IP (Transmission Control Protocol/Internet Protocol) layered models.
    1. Explore how TCP uses segmentation.
    2. Differences between the OSI and TCP/IP model.
    3. Functions included in the Internet layer.
3. IP addressing (IPv4).
    1. Break down the different classes of IP addresses.
    2. Subnetting IPv4 addresses.
    3. Improve network performance by subnetting.
4. IP addressing (IPv6)
    1. IPv6 Prefix length.
    2. IPv6 Unicast addresses.
    3. Link-local addresses.
    4. Unique local addresses.
5. Routing.
    1. Set password on VTY lines.
    2. Set IP addresses on router interfaces.
    3. Set the clock rate on serial interfaces.
6. Functions of common networking protocols.
    1. How protocols allow communication to occur.
    2. Functions of User Datagram protocol (UDP).
    3. Acknowledgements to ensure delivery of IP packets.
7. DNS (Domain Name System).
    1. Resolving a DNS name.
    2. Hierarchical DNS servers.
8. Network troubleshooting methodology.
    1. Using the OSI model in troubleshooting.
    2. Protocol analysis of a small network.
9. Installation and configuration of routers and switches for a given scenario.
    1. Implement VLan's.
    2. Set the management VLan on switches.
    3. Configure router interfaces
10. Installation and configuration of a wireless network for a given scenario.
    1. Set passwords.
    2. Set DHCP.
    3. Set encryption to AES and security mode to WPA2 personal.
11. DHCP (Dynamic Host Configuration Protocol).
    1. Set maximum number of users.
    2. Change the client lease time.
12. Planning and implementation of a basic SOHO (Small Office/Home Office) network for a given set of requirements.
    1. Network security and performance.
    2. Developing IP and subnets maps.

Lab: *(if the "Lab Hours" is greater than zero this is required)*

9. Course Student Learning Outcomes:

1.

Describe and differentiate the devices and services used to support communications in data networks and the Internet.

2.

Evaluate sensible solutions in simulated network issues.

3.

Implement established and successful network designs and protocols.

10. Course Objectives: *Upon completion of this course, students will be able to:*
   a. Describe and differentiate the devices and services used to support communications in data networks and the Internet.
   b. Describe the role of protocol layers in data networks.
   c. Evaluate the importance of addressing and naming schemes at various layers of data networks in IPv4 and IPv6 environments.
   d. Design, calculate, and apply subnet masks and addresses to fulfill given requirements in IPv4 and IPv6 networks.

11. Methods of Instruction: *(Integration: Elements should validate parallel course outline elements)*
   a. Activity
   b. Collaborative/Team
   c. Demonstration, Repetition/Practice
   d. Discussion
   e. Distance Education
   f. Lecture
   g. Technology-based instruction

   Other Methods:

   > Projects in order to facilitate and demonstrate the acquisition of skills required to relate the OSI model to router and switch commutations.

12. Assignments: *(List samples of specific activities/assignments students are expected to complete both in and outside of class.)*
   In Class Hours: 27.00
   Outside Class Hours: 54.00
   a. In-class Assignments

   > - Building a Simple Network
   > - Configuring a Switch Management Address
   > - Using Wireshark to View Network Traffic
   > - Using Wireshark to Examine Ethernet Frames
   > - Viewing Network Device MAC Addresses
   > - Viewing the Switch MAC Address Table
   > - Exploring Router Physical Characteristics
   > - Building a Switch and Router Network
   > - Identifying IPv6 Addresses
   > - Configuring IPv6 Addresses on Network Devices
   > - Testing Network Connectivity with Ping and Traceroute
   > - Designing and Implementing a Subnetted IPv4 Addressing Scheme
   > - Designing and Implementing a VLSM Addressing Scheme
   > - Accessing Network Devices with SSH
   > - Securing Network Devices
   > - Managing Router Configuration Files with Terminal Emulation Software
   > - Managing Device Configuration Files Using TFTP Flash and USB
   > - Observing ARP with the Windows CLI IOS CLI and Wireshark

   b. Out-of-class Assignments

   > - Students are required to read the Cisco Netacad Web site and the CCNA Routing and Switching Introduction to Networks Companion Guide booklet.
   > - Utilizing the concepts learned, students will wright a paper clarifying the (OSI) Open System Interconnect model on how each layer is used and aligning protocols to each layer. Students will also wright a list IP addresses used to subnet a class A, B, and C network.
   > - Students will be completing assignments outside of class utilizing Packet Tracer, NetAcad, and

Netlab. These assignments will consist of preset configuration requirements covering different router and switch networking scenarios.

13. Methods of Evaluating Student Progress: *The student will demonstrate proficiency by:*
- Written homework

  Written on-line assignments; these topics are called out in the CISCO curriculum.
- Laboratory projects

  Laboratory projects/performance within Netlab, a locally hosted network simulator.
- Computational/problem solving evaluations
- Presentations/student demonstration observations

  Hands-on-projects and a combination of examinations, presentations, discussions, or problem-solving assignments.

  Presentations of projects within specific modules.
- Group activity participation/observation

  Class and individual projects such as an addressing scheme for a proposed local network.
- True/false/multiple choice examinations

  Testing of each module on the CISCO site.
- Mid-term and final evaluations

  Final examination/skills assessment administered on the CISCO site.
- Student participation/contribution

14. Methods of Evaluating: Additional Assessment Information:

15. Need/Purpose/Rationale -- *All courses must meet one or more CCC missions.*

    PO - Career and Technical Education

    Fulfill the requirements for an entry- level position in their field.

    Apply critical thinking skills to execute daily duties in their area of employment.

    Apply critical thinking skills to research, evaluate, analyze, and synthesize information.

    Display the skills and aptitude necessary to pass certification exams in their field.

    Exhibit effective written, oral communication and interpersonal skills.

    IO - Personal and Professional Development

    Demonstrate an understanding of ethical issues to make sound judgments and decisions.

    IO - Scientific Inquiry

    Collect and analyze data. Skills of data collection include an understanding of the notion of hypothesis testing and specific methods of inquiry such as experimentation and systematic observation.

    IO - Critical Thinking and Communication

    Apply principles of logic to problem solve and reason with a fair and open mind.

    IO - Global Citizenship - Scientific & Technological Literacy

    Synthesize, interpret, and infer, utilizing information, data, and experience to solve problems, innovate, and explore solutions.

    IO - Global Citizenship - Ethical Behavior

    Apply ethical reasoning to contemporary issues and moral dilemmas.

16. Comparable Transfer Course

University System	Campus	Course Number	Course Title	Catalog Year

17. Special Materials and/or Equipment Required of Students:

18. Materials Fees: ☐ Required Material?

Material or Item	Cost Per Unit	Total Cost

CIS 353A-Computer Network Fundamentals I

19. Provide Reasons for the Substantial Modifications or New Course:

This course, together with CIS 353B, prepares students for the CompTIA Network+ certification exam. This certification will help them obtain employment in an IT-related field. The course is also oriented and the nontraditional student who does not desire to continue to a 4 year college but rather benefit from gainful IT-related employment.

20.   a. Cross-Listed Course *(Enter Course Code)*: *N/A*
    b. Replacement Course *(Enter original Course Code)*: *N/A*

21. Grading Method *(choose one)*: Pass/No Pass Only

22. MIS Course Data Elements
    a. Course Control Number [CB00]: CCC000580646
    b. T.O.P. Code [CB03]: 70100.00 - Information Technology, G
    c. Credit Status [CB04]: N - Noncredit
    d. Course Transfer Status [CB05]: C = Non-Transferable
    e. Basic Skills Status [CB08]: 2N = Not basic skills course
    f. Vocational Status [CB09]: Clearly Occupational
    g. Course Classification [CB11]: J - Workforce Preparation Enhanced Funding
    h. Special Class Status [CB13]: N - Not Special
    i. Course CAN Code [CB14]: *N/A*
    j. Course Prior to College Level [CB21]: Y = Not Applicable
    k. Course Noncredit Category [CB22]: J - Workforce Preparation
    l. Funding Agency Category [CB23]: Y = Not Applicable
    m. Program Status [CB24]: 1 = Program Applicable
Name of Approved Program *(if program-applicable)*: NETWORK+ PREPARATORY
Attach listings of Degree and/or Certificate Programs showing this course as a required or a restricted elective.)

23. Enrollment - Estimate Enrollment
First Year: 12
Third Year: 32

24. Resources - Faculty - Discipline and Other Qualifications:
    a. Sufficient Faculty Resources: Yes
    b. If No, list number of FTE needed to offer this course: *N/A*

25. Additional Equipment and/or Supplies Needed and Source of Funding.
N/A

26. Additional Construction or Modification of Existing Classroom Space Needed. *(Explain:)*
N/A

27. FOR NEW OR SUBSTANTIALLY MODIFIED COURSES
Library and/or Learning Resources Present in the Collection are Sufficient to Meet the Need of the Students Enrolled in the Course: Yes

28. Originator Felix Marhuenda-Donate   Origination Date 09/13/16

06/06/2018   5 of 5