COLLEGE OF THE DESERT

Course Outline of Record

1. Course Code: CIS-055
2.   a. Long Course Title: Systems and Network Administration
      b. Short Course Title: SYSTEM/NETWORK ADMIN
3.   a. Catalog Course Description:

    This course will provide a student with the knowledge and skills required to build, maintain, troubleshoot and support server hardware and software technologies. The student will be able to identify environmental issues; understand and comply with disaster recovery and physical / software security procedures; become familiar with industry terminology and concepts; understand server roles / specializations and interaction within the overall computing environment. This course will prepare students for the current version of CompTIA's Server+ certification exam.

    b. Class Schedule Course Description:

    This course will prepare students for the current version of CompTIA's Server+ certification exam.

    c. Semester Cycle (*if applicable*): Spring

    d. Name of Approved Program(s):
    - COMPUTER INFORMATION SYSTEMS AS DEGREE AS Degree for Employment Preparation
    - COMPUTER INFORMATION SYSTEMS AS Degree for Employment Preparation
    - COMPUTER INFORMATION SYSTEMS Certificate of Achievement
    - COMPUTER INFORMATION SYSTEMS* Certificate of Achievement

4. Total Units: 3.00   Total Semester Hrs: 54.00

    Lecture Units: 3   Semester Lecture Hrs: 54.00

    Lab Units: 0   Semester Lab Hrs: 0

        Class Size Maximum: 32   Allow Audit: No

        Repeatability 0x

        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)

    Prerequisite: CIS 054 with a minimum grade of C

6. Textbooks, Required Reading or Software: *(List in APA or MLA format.)*

    a. Lachance, D. (2016). *CompTIA Server+ Certification All-in-One Exam Guide (Exam SK0-004)* (1st/e). McGraw-Hill. ISBN: 9781259838033

        College Level: Yes

        Flesch-Kincaid reading level: 12

7. Entrance Skills: *Before entering the course students must be able:*

    a.

    Select the appropriate network and equipment for an installation.

    - CIS 054 - Describe basic switching concepts, how VLANs create logically separate networks and how routing occurs between them, and enhanced switching technologies such as VLANs, VLAN Trunking Protocol (VTP), Rapid Spanning Tree Protocol (RSTP), Per VLAN Spanning Tree Protocol (PVSTP), and 802.1q.

    b.

    Install the hardware and software for a simple local area network.

    - CIS 054 - Configure and troubleshoot basic operations of a small switched network, VLANs, and inter-VLAN routing.

    c.

    Select appropriate hardware and software to integrate different networks.

- CIS 054 - Configure and troubleshoot basic operations of a small switched network, VLANs, and inter-VLAN routing.
- CIS 054 - Understand and describe the purpose, nature, and operations of a router, routing tables, and the route lookup process, dynamic routing protocols, distance vector routing protocols, and link-state routing protocols, the purpose and types of access control lists (ACLs), and and the operations and benefits of Dynamic Host Configuration Protocol (DHCP), Domain Name System (DNS) for IPv4 and IPv6, and Network Address Translation (NAT).

d.

Explain the OSI networking model.

- CIS 054 - Configure and verify static routing and default routing; configure and troubleshoot basic operations of routers in a small routed network including Routing Information Protocol (RIPv1 and RIPv2) and Open Shortest Path First (OSPF) protocol (single-area OSPF); Configure, monitor, and troubleshoot ACLs for IPv4 and IPv6; and configure and troubleshoot NAT operations.

e.

Configure a TCP/IP network client.

- CIS 054 - Understand and describe the purpose, nature, and operations of a router, routing tables, and the route lookup process, dynamic routing protocols, distance vector routing protocols, and link-state routing protocols, the purpose and types of access control lists (ACLs), and and the operations and benefits of Dynamic Host Configuration Protocol (DHCP), Domain Name System (DNS) for IPv4 and IPv6, and Network Address Translation (NAT).

8. Course Content and Scope:

Lecture:

1. Introduction to servers
    1. Examine the network architecture
    2. Identify common server types and functions
2. Exploring the server hardware
    1. Identify server system board components
    2. Explore system processing core
    3. Explore server memory
    4. Examine server cooling and power systems
3. Introduction to server software
    1. Describe server software
    2. Network operating system (NOS) management features
    3. Network operating system (NOS) security features
    4. Network essentials for servers
4. Exploring the server storage system
    1. Examine storage devices used for servers
    2. Exploring disk interfaces, such as Integrated Drive Electronics (IDE) and Small Computer System Interface (SCSI)
    3. Describe Random Arrays of Independent Disks (RAID)
    4. Explore Network-Attached Storage (NAS) implementations
    5. Explore Storage Area Network (SAN) implementations
5. Installing the server hardware
    1. Identify the best practices in server hardware installation
    2. Install hardware components on a server
    3. Verify server installation
    4. Install a server in a network environment
6. Configuring servers
    1. Network operating system (NOS) installation and verification
    2. Install system monitoring agents and service tools
    3. Server configuration documentation
7. Examining the issues in upgrading server components
    1. Examine an upgrade checklist
    2. Examine the issues in upgrading server hardware

3. Examine the issues in upgrading server software
8. Examining servers in an it environment
    1. Industry best practices for server installation and maintenance
    2. Server security and access methods
9. Troubleshooting servers
    1. Examine the troubleshooting theory and methodologies
    2. Troubleshoot server hardware problems
    3. Troubleshoot server software problems
    4. Troubleshoot server network problems
    5. Troubleshoot server storage device problems
10. Exploring disaster recovery concepts and methodologies
    1. Examine disaster recovery plans
    2. Implement disaster recovery methodologies
    3. Implement replication methods

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

9. Course Student Learning Outcomes:

1.

Design, configure, maintain and troubleshoot industry standard servers.

2.

Perform system backup and recovery operations.

3.

Install and maintain multiple-drive arrays.

4.

Manage multiple servers in a networked environment.

10. Course Objectives: *Upon completion of this course, students will be able to:*
    a. Identify the hardware components of a server.
    b. Describe the features of server software.
    c. Examine the various types of storage systems used in servers.
    d. Install hardware components on a server.
    e. Configure and troubleshoot servers.
    f. Examine the issues in upgrading server components.
    g. Identify some of the industry's best practices for deploying a server and the various strategies of securing, accessing, and remotely managing the server hardware.
    h. Describe and employ disaster recovery concepts and techniques.

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. Observation
    h. Participation
    i. Technology-based instruction

12. Assignments: *(List samples of specific activities/assignments students are expected to complete both in and outside of class.)*

In Class Hours: 54.00

Outside Class Hours: 108.00

      a. Out-of-class Assignments

> The following out of class assignments may be used in the course:
> - projects (server installation, configuration and maintenance with multiple server operating systems)
> - research projects (e.g. research troubleshooting methods for server problems).

      b. In-class Assignments

> 1. Complete a flow chart indicating correct procedures for documenting server environment.
> 2. Describe the proper configuration for a given server performance issue.
> 3. Troubleshoot a computer system that contains a given hardware or software glitch in the server set-up.
> 4. Complete assigned practice test questions in a simulated CompTIA exam environment.

13. Methods of Evaluating Student Progress: *The student will demonstrate proficiency by:*
    - Written homework
      Students are evaluated on skills and abilities related to CompTIA Server+ certification examination preparation.
    - Computational/problem solving evaluations
      Demonstration of various server characteristics on the computer Solutions to assigned server problems Troubleshoot solutions to server faults Class analysis of assigned server problems
    - Product/project development evaluation
      Hands-on lab exercises and tests utilizing various types of server procedures
    - True/false/multiple choice examinations
      Demonstration of knowledge of server fundamentals through various types of examinations (multiple-choice, true/false)
    - Mid-term and final evaluations
      Final exam for the course will consist of the CompTIA Server+ SKO-004

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**

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

This course will prepare students for the current version of CompTIA's Server+ certification exam.
20. a. Cross-Listed Course *(Enter Course Code)*: *N/A*
 b. Replacement Course *(Enter original Course Code)*: *N/A*

21. Grading Method *(choose one)*: Letter Grade Only

22. MIS Course Data Elements
 a. Course Control Number [CB00]: CCC000579570
 b. T.O.P. Code [CB03]: 70100.00 - Information Technology, G
 c. Credit Status [CB04]: D - Credit - Degree Applicable
 d. Course Transfer Status [CB05]: B = Transfer CSU
 e. Basic Skills Status [CB08]: 2N = Not basic skills course
 f. Vocational Status [CB09]: Clearly Occupational
 g. Course Classification [CB11]: Y - Credit Course
 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]: Y - Not Applicable
 l. Funding Agency Category [CB23]: Y = Not Applicable
 m. Program Status [CB24]: 1 = Program Applicable
Name of Approved Program *(if program-applicable)*: COMPUTER INFORMATION SYSTEMS,COMPUTER INFORMATION SYSTEMS
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 Jose Marhuenda-Donate Origination Date 10/06/16