

SAN DIEGO COMMUNITY COLLEGE DISTRICT
CONTINUING EDUCATION
COURSE OUTLINE

SECTION I

SUBJECT AREA AND COURSE NUMBER

COMP 651

COURSE TITLE

VIRTUAL DATACENTER 1

TYPE COURSE

NON-FEE

VOCATIONAL

CATALOG COURSE DESCRIPTION

This course includes the installation and configuration of the infrastructure that makes up a software-defined datacenter. Students will install and configure virtual machines, host hypervisors, and virtual datacenters. Students will be introduced to virtual network devices and concepts. Students will learn about cloud computing, hardware requirements, and virtual hardware resources. (FT)

LECTURE/LABORATORY HOURS

60

ADVISORY

COMP 608 Basic Network Configuration
AND

COMP 642 Server Admin Fundamentals OR COMP 643 Linux Server Technologies

RECOMMENDED SKILL LEVEL

Possess a 10th grade reading level; ability to communicate effectively in the English language; knowledge of math concepts at the 8th grade level and basic computer literacy.

INSTITUTIONAL STUDENT LEARNING OUTCOMES

1. Social Responsibility
SDCE students demonstrate interpersonal skills by learning and working cooperatively in a diverse environment.
2. Effective Communication
SDCE students demonstrate effective communication skills.

INSTITUTIONAL STUDENT LEARNING OUTCOMES (CONTINUED)

3. Critical Thinking
SDCE students critically process information, make decisions, and solve problems independently or cooperatively.
4. Personal and Professional Development
SDCE students pursue short term and life-long learning goals, mastering necessary skills and using resource management and self-advocacy skills to cope with changing situations in their lives.

COURSE GOALS

1. Gain an understanding of the software-defined data center.
2. Learn about host hypervisors and guest virtual machines.
3. Gain an understanding of the virtual infrastructure management architecture.
4. Learn about virtual infrastructure management servers and appliances.
5. Use a virtual infrastructure management server to manage a host hypervisor.
6. Explore the configuration and management of the virtual machine host infrastructure with a hypervisor client and web client.
7. Explore virtual networks and virtual standard switches.
8. Use a virtual infrastructure management server to manage various types of host storage.

COURSE OBJECTIVES

1. Describe the components of a software-defined datacenter.
2. Install and configure virtual infrastructure management server or appliance.
3. Install and configure virtual machine host hypervisors.
4. Create and deploy virtual machines.
5. Install guest operating systems on virtual machine.
6. Configure and manage virtual networks and network devices.
7. Configure and manage virtual storage.

SECTION II

COURSE CONTENT AND SCOPE

1. Data Center Virtualization
 - 1.1. Components
 - 1.1.1. Virtual switches
 - 1.1.2. Virtual Ethernet adapters
 - 1.1.3. Hypervisor client
 - 1.1.4. Hypervisor web client
 - 1.1.5. Hypervisors
 - 1.1.6. Virtual machines

COURSE CONTENT AND SCOPE (CONTINUED)

- 1.2. Cloud architecture
 - 1.2.1. Physical
 - 1.2.2. Virtual
 - 1.2.3. Benefits
- 1.3. Hypervisor client
 - 1.3.1. Installation
 - 1.3.2. Usage
- 2. Virtual Machine Management
 - 2.1. Components
 - 2.1.1. Hardware
 - 2.1.2. Files
 - 2.1.3. Operating system
 - 2.1.4. Virtual machine tools
 - 2.1.5. Files
 - 2.2. Virtual resources
 - 2.2.1. Central Processing Unit (CPU)
 - 2.2.2. Memory
 - 2.2.3. Network adapters
 - 2.2.4. Disk controllers
 - 2.2.5. Parallel and serial ports
 - 2.3. Deployment
 - 2.3.1. Templates
 - 2.3.2. Cloning
 - 2.4. Snapshots
 - 2.4.1. Files
 - 2.4.2. Manager
 - 2.5. Migrations
 - 2.5.1. Virtual machines
 - 2.5.2. Virtual storage
 - 2.6. Virtual applications
- 3. Virtual Infrastructure Management Server
 - 3.1. Architecture
 - 3.1.1. Components
 - 3.1.2. Server services and interfaces
 - 3.1.3. Communication process
 - 3.2. Deployment
 - 3.2.1. Deployment type
 - 3.2.2. Installation
 - 3.2.3. Datastore
 - 3.2.4. License management
 - 3.2.5. System monitoring
 - 3.3. Web Client
 - 3.3.1. Access
 - 3.3.2. Views

COURSE CONTENT AND SCOPE (CONTINUED)

- 3.4. Inventory
 - 3.4.1. Data center objects
 - 3.4.2. Licenses
 - 3.4.3. Events and logs
- 4. Virtual Networks
 - 4.1. Virtual switch connection types
 - 4.1.1. Virtual machine port groups
 - 4.1.2. Vmkernel port
 - 4.1.3. Uplink port
 - 4.1.4. Port groups
 - 4.2. Switch types
 - 4.2.1. Standard
 - 4.2.2. Distributed
 - 4.2.3. Configuration
 - 4.3. VLANs (Virtual Local Area Network)
 - 4.3.1. Tagging
 - 4.3.2. Trunk ports
 - 4.4. Virtual switch
 - 4.4.1. Load-balancing algorithm
 - 4.5. Configuration
 - 4.5.1. Promiscuous mode
 - 4.5.2. Network policies
 - 4.5.3. Traffic shaping
 - 4.5.4. NIC teaming
 - 4.5.5. Failover
 - 4.5.6. Load balancing methods
- 5. Virtual Storage
 - 5.1. Storage protocols
 - 5.1.1. iSCSI (Internet Small Computer System Interface)
 - 5.1.2. NFS (Network File System)
 - 5.1.3. iFibre Channel
 - 5.2. Naming conventions
 - 5.3. Hypervisor storage configuration
 - 5.3.1. VMFS (Virtual Machine File System)
 - 5.3.2. NFS
 - 5.3.3. Virtual SAN (Storage Area Network)
 - 5.4. Hypervisor datastores
 - 5.4.1. Creation
 - 5.4.2. Management
 - 5.5. Virtual SAN
 - 5.5.1. Deployment

APPROPRIATE READINGS

Appropriate readings may include, but are not limited to, periodicals, magazines, instructor-written materials, manuals, instructor selected URLs, and publications related to the implementation of virtualization technologies, including software-defined datacenters, networking, and virtual machine management.

WRITING ASSIGNMENTS

Appropriate writing assignments may include, but are not limited to, preparing text for an assigned project, documenting all laboratories and project work, and completing all written assigned reports, such as how datacenters are deployed.

OUTSIDE ASSIGNMENTS

Outside assignments may include, but are not limited to, reading texts and reference resources; research as needed to complete projects, such as how cloud computing is used to deliver data and services; and organizing and preparing written answers to assigned questions.

APPROPRIATE ASSIGNMENTS THAT DEMONSTRATE CRITICAL THINKING

Assignments which demonstrate critical thinking may include, but are not limited to, analysis and evaluation of assigned text and reference resources, and utilize this analysis in classroom discussions, performing laboratory activities, and in researching and comparing the strengths and benefits of the different types of hypervisors. Students must select appropriate methods and resources needed to complete laboratory assignments.

EVALUATION

A student's grade will be based on multiple measures of performance and will include evaluation of student's ability to:

1. Perform in a variety of activities and assignments related to the course objectives.
2. Complete written and practical examinations.
3. Contribute to class and group discussions.
4. Maintain attendance and punctuality per current policy.
5. Demonstrate ability to work independently and as a team member.
6. Demonstrate troubleshooting skills.

Upon successful completion of each course in the program, a Certificate of Course Completion will be issued. Upon successful completion of all courses included in the program, a Certificate of Program Completion will be issued.

METHOD OF INSTRUCTION

Methods of instruction may include, but are not limited to, lectures, self-paced lab, demonstrations, individualized study, use of audio-visual aids, group/team work, tutorials, outside assignments, guest lectures, field trips, and guided student job assignments. This course, or sections of this course, may be offered through distance education.

TEXTS AND SUPPLIES

VMware vSphere: Install, Configure, Manage, VMware Educational services, current edition
Mastering VMware vSphere 6, Nick Marshall, Grant Orchard, Josh Atwell, Scott Lowe, Wiley Publishing, current edition
Web Resources: <https://mylearn.vmware.com>

Supplies: Journal (composition book), USB Drive or other storage media

PREPARED BY: Richard Gholson DATE: 12/07/2016

REVISED BY: _____ DATE: _____

Instructors must meet all requirements stated in Policy 3100 (Student Rights, Responsibilities and Administrative Due Process), and the Attendance Policy set forth in the Continuing Education Catalog.

REFERENCES:

San Diego Community College District Policy 3100
California Community Colleges, Title 5, Section 55002
Continuing Education Catalog