Las Positas College
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Course Outline for CNT 7701

VIRTUALIZATION: VMWARE, HYPER-V, CITRIX

Effective: Fall 2018

I. CATALOG DESCRIPTION:
CNT 7701 — VIRTUALIZATION: VMWARE, HYPER-V, CITRIX — 2.00 units

Upon completion of this course, the students will have covered the topics required for taking the examination to become a VMware Certified Professional. This hands-on training course explores installation, configuration, and management of VMware virtualization products. This class also covers Microsoft Hyper-V and Citrix virtualization technologies.

1.50 Units Lecture 0.50 Units Lab

Strongly Recommended
CIS 50 - Intro to Computing Info Tech
with a minimum grade of C

CNT 55 - Installing & Configuring Windows Server MCSA I
with a minimum grade of C

CNT 8001 - Introduction to Networks (CCNA1)
with a minimum grade of C

Grading Methods:
Letter or P/NP

Discipline:
- Computer Service Technology

	MIN
Lecture Hours:	27.00
Lab Hours:	27.00
Total Hours:	54.00

II. NUMBER OF TIMES COURSE MAY BE TAKEN FOR CREDIT: 1

III. PREREQUISITE AND/OR ADVISORY SKILLS:

Before entering this course, it is strongly recommended that the student should be able to:

A. CIS50
1. Describe existing and emerging technologies and their impact on organizations and society;
2. Describe and evaluate the development and use of information systems in business;
3. Solve common business problems using approporiate Information Technology applications and systems;
4. Demonstrate familiarity with the computing environment, including the hardware, operating system, the user interface, and applications;
5. Describe the capabilities, use, and characteristics of programming languages in a computer environment.

B. CNT55
1. Install and Configure Servers, Local Storage, and File & Share Access
2. Configure Print and Document Services
3. Configure Servers for Remote Management
4. Create and Configuring Virtual Machine Settings, Storage, and Virtual Networks
5. Create and Managing Active Directory Users, Groups and Organizational Units
6. Create Group Policy Objects, Security Policies, and Application Restriction Policies

C. CNT8001
1. describe the role of protocol layers in data networks;
2. evaluate the importance of addressing and naming schemes at various layers of data networks in IPv4 and IPv6 environments;
3. design, calculate, and apply subnet masks and addresses to fulfill given requirements in IPv4 and IPv6 networks;
4. explain fundamental Ethernet concepts such as media, services, and operations;
5. build a simple Ethernet network using routers and switches;
6. compose Cisco command-line interface (CLI) commands to perform basic router and switch configurations;
7. experiment with common network utilities to verify small network operations and analyze data traffic.

IV. MEASURABLE OBJECTIVES:

Upon completion of this course, the student should be able to:

A. Describe the software-defined data center and the vCenter Server architecture
B. Install and configure ESX and vCenter Server
C. Configure and manage ESX networking and storage using vCenter Server
D. Deploy and manage virtual machines
E. Manage user access to the VMware infrastructure
F. Increase scalability, monitor resource usage and manage higher availability and data protection using vCenter Server
G. Apply patches using VMware vCenter Update Manager

V. CONTENT:

A. Course Introduction
    1. Introductions and course logistics
    2. Course objectives
    3. References and resources
B. Software-Defined Data Center
    1. Introduce components of the software-defined data center
    2. Describe where vSphere fits into the cloud architecture
    3. Install and use vSphere Client
    4. Overview of ESXi
C. Creating Virtual Machines
    1. Introduce virtual machines, virtual machine hardware, and virtual machine files
    2. Create and work with virtual machines and templates
D. vCenter Server
    1. Introduce the vCenter Server architecture
    2. Deploy and configure vCenter Server Appliance
    3. Use vSphere Web Client
    4. Manage vCenter Server inventory objects and licenses
E. Configuring and Managing Virtual Networks
    1. Describe, create, and manage standard switches
    2. Configure virtual switch security and load-balancing policies
    3. Create, configure, and manage vSphere distributed switches,
    4. network connections, and port groups
F. Configuring and Managing Virtual Storage
    1. Introduce storage protocols and storage device types
    2. Discuss ESXi hosts using iSCSI and NFS storage
    3. Create and manage VMFS and NFS datastores
    4. Introduce VMware Virtual SAN™
    5. Introduce Virtual Volumes
G. Virtual Machine Management
    1. Use templates and cloning to deploy new virtual machines
    2. Modify and manage virtual machines
    3. Perform vSphere vMotion and vSphere Storage vMotion migrations
    4. Create and manage virtual machine snapshots
    5. Create vApps
    6. Introduce the types of content libraries and how to deploy and use them
H. Resource Management and Monitoring
    1. Introduce virtual CPU and memory concepts
    2. Configure and manage resource pools
    3. Describe methods for optimizing CPU and memory usage
    4. Use various tools to monitor resource usage
    5. Create and use alarms to report certain conditions or events
    6. Identify and troubleshoot virtual machine resource issues
    7. Introduce vRealize Operations Manager for data center monitoring and management
I. vSphere HA and vSphere Fault Tolerance
    1. Explain the vSphere HA architecture
    2. Configure and manage a vSphere HA cluster
    3. Use vSphere HA advanced parameters
    4. Introduce vSphere Fault Tolerance
    5. Enable vSphere Fault Tolerance on virtual machines
    6. Introduce vSphere Replication
    7. Use vSphere Data Protection to back up and restore data
J. Host Scalability
    1. Describe the functions and benefits of a vSphere DRS cluster
    2. Configure and manage a vSphere DRS cluster
    3. Work with affinity and anti-affinity rules
    4. Use vSphere HA and vSphere DRS together for business
    5. continuity
K. vSphere Update Manager and Host Maintenance
    1. Use vSphere Update Manager to manage ESXi patching
    2. Install vSphere Update Manager and the vSphere Update
    3. Manager plug-in
    4. Create patch baselines
    5. Use host profiles to manage host configuration compliance
    6. Scan and remediate hosts
L. Installing vSphere Components
    1. Install ESXi
    2. Introduce vCenter Server deployment options
    3. Describe vCenter Server hardware, software, and database
    4. requirements
    5. Discuss installation of vCenter Server Appliance and a vCenter
    6. Server instance
    7. Demonstrate vCenter Server installation
M. Labs
    1. Using the VMware vSphere Web Client
    2. Configuring the Vmware vSphere vCenter Server Appliance
    3. Configuring Vmware ESXi
    4. Working with Virtual Machines

5. Access Control - NETLAB+ SUPPLEMENTAL LAB1
6. Creating Folders in Vmware vCenter Server
7. Using Standard & Distributed Switches
8. Accessing iSCSI Storage
9. Accessing NFS Storage
10. Managing Vmware vSphere
11. Using Templates and Clones
12. Modifying a Virtual Machine
13. Migrating Virtual Machines
14. Managing Virtual Machines
15. Managing Vmware vSphere Apps
16. Resource Pools
17. Monitoring Virtual Machine Performance
18. Using Alarms
19. Using vSphere High Availability
20. VMware Vsphere Distributed Resource Scheduler
21. Configuring VMware vSphere Fault Tolerance

VI. METHODS OF INSTRUCTION:

A. **Lecture** -
B. **Lab** -
C. **Discussion** -
D. **Demonstration** -

VII. TYPICAL ASSIGNMENTS:

A. Reading Assignments
   1. Textbook readings and online supporting webpages to inform the students of a software-defined data center and the vCenter Server architecture.
B. Hands-on Lab Assignments
   1. Complete hands-on labs using the BACCC ICT remote lab environmnet to install and configure ESX and vCenter Server, configure and manage ESX networking and storage using vCenter Server, deploy and manage virtual machines, and manage user access to the VMware infrastructure.

VIII. EVALUATION:

A. **Methods**

1. Exams/Tests
2. Quizzes
3. Projects
4. Class Participation
5. Lab Activities

B. **Frequency**

1. Weekly labs
2. Daily participation in discussion and interaction
3. Quizzes for each module
4. One mid-term exam per semester
5. One final exam per semester
6. Weekly Labs
7. Final project

IX. TYPICAL TEXTS:

1. VMware Academic Program. *VMware IT Academy vSphere: Install, Configure, Manage [V6.0] eKit.* 1st Edition ed., Gilmore Global, 2016.
2. Ferguson , Bill . *vSphere 6 Foundations Exam Official Cert Guide (Exam #2V0-620).* 1 ed., VMware Press, 2016.
3. Davis, John , Steve Baca, and Thomas Owen . *VCP6-DCV Official Cert Guide (Exam #2V0-621).* 3 ed., VMWare Press, 2016.
4. eCourseware available through the VMware Academy Program (VMAP).

X. OTHER MATERIALS REQUIRED OF STUDENTS: