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Course Outline for CNT 7701

VMWARE VCP CERTIFICATION & VIRTUALIZATION

Effective: Spring 2019

I. CATALOG DESCRIPTION:
CNT 7701 — VMWARE VCP CERTIFICATION & VIRTUALIZATION — 2.00 units

With VMware, students learn about virtualization, SDNs (Software Defined Networks), data center management, and remote operation of IT infrastructures in the Cloud. Increasingly, businesses are moving their IT services to data centers, and skilled VMware professionals are and will be in high demand for the foreseeable future. vSphere - the major VMware platform - includes features for configuration, backup, cloning, resizing, securing, and moving virtual machines. Upon completion of this course, students will have covered the topics required for taking the examination for the VMware Certified Professional (VCP). This hands-on training course will have students install, configure, and manage different VMware virtualization products. Microsoft Hyper-V and Citrix virtulization technologies will be introduced.

1.50 Units Lecture 0.50 Units Lab

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

CNT 51 - CompTIA's A+ Certification Computer Technician
with a minimum grade of C

CNT 52 - Networking Fundamentals
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. CNT8001
1. describe and differentiate the devices and services used to support communications in data networks and the Internet;
2. describe the role of protocol layers in data networks;
3. evaluate the importance of addressing and naming schemes at various layers of data networks in IPv4 and IPv6 environments;
4. design, calculate, and apply subnet masks and addresses to fulfill given requirements in IPv4 and IPv6 networks;
5. explain fundamental Ethernet concepts such as media, services, and operations;
6. build a simple Ethernet network using routers and switches;
7. compose Cisco command-line interface (CLI) commands to perform basic router and switch configurations;
8. experiment with common network utilities to verify small network operations and analyze data traffic.

B. CNT51
C. CNT52
1. list and explain the layers of the OSI model and the TCP/IP Stack and desribe the roles of protocol layers in data networks;
2. describe and differentiate the devices, protocols, and services used to support communications in data networks and the Internet;
3. calculate both IPv4 and IP6 subnets, and segment a large network into smaller parts;
4. evaluate the importance of addressing and naming schemes at various layers of data networks in IPv4 and IPv6 environments;
5. design and assemble an Ethernet network and a wireless network, including routers, switches, and cables;
6. explain Ethernet topologies, and relevant IEEE hardware and software specifications;

7. build a router and switch topology; and configure the devices to communicate with computers;
8. identify the responsibilities of a LAN system administrator;
9. monitor the network activity using monitoring tools to view packets and analyze 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:

Methods/Frequency

A. Exams/Tests
    Weekly Exams
B. Quizzes
    Weekly Quizzes
C. Projects
    Weekly Labs
D. Simulation
    Weekly Simulations on Remote Equipment
E. Lab Activities
    Weekly Labs

IX. TYPICAL TEXTS:

1. Ferguson , Bill. *vSphere 6 Foundations Exam Official Cert Guide (Exam #2V0-620).* 2nd ed., VMware Press, 2017.
2. Davis, John, Steve Baca, and Owen Thomas. *VCP6-DCV Official Cert Guide (Exam #2V0-621).* 4th ed., VMWare Press, 2017.
3. VMware Academic Program. *VMware IT Academy vSphere: Install, Configure, Manage [V6.0] eKit.* 2nd ed., Gilmore Global, 2018.
4. eCourseware available through the VMware Academy Program (VMAP).

X. OTHER MATERIALS REQUIRED OF STUDENTS: