

JEFFERSON COLLEGE

COURSE SYLLABUS

CIS221

Virtualization and the Cloud

4 Credit Hours

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Date: 10/15/2016

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CIS221 Virtualization and the Cloud

I. CATALOGUE DESCRIPTION

- A. Pre-requisite: CIS220 MS Server II; Reading Proficiency
- B. 4 Credit Hours
- C. This course presents a working knowledge on concepts of virtualization of servers/storage with introduction to cloud computing. The described technologies provide the basis for green computing, server consolidation and disaster recovery. Several aspects of virtualization and cloud computing are accompanied by practical applications and examples of utilization in the IT industry. Design, deployment and management of datacenters, including utilization of open-source systems, are analyzed in conjunction with using VMware solutions. (S,O)

II. EXPECTED LEARNING OUTCOMES/CORRESPONDING ASSESSMENT MEASURES

Identify and define common types of virtualization, benefits of physical versus virtual environments	Quizzes Exams Certification Exam
Identify and define Hypervisors and their networks in Windows and in VMware ESXi configurations	Quizzes Exams Certification Exam
Identify and differentiate between various Windows Operating Systems	Quizzes Exams Certification Exam
Define and demonstrate knowledge of virtual machines, their components, as well as any backup storage solutions like NAS or the Cloud.	Quizzes Exams Hands-On Exercises Certification Exam
Identify and define Datastores, use of Storage Area Networks and Host Clusters	Quizzes Exams Hands-On Exercises Certification Exam
Install and configure VMware with Cloud Storage on Open Source Operating Systems.	Quizzes Exams Hands-On Exercises Certification Exam

III. OUTLINE OF TOPICS

- A. Introduction to Virtualization
 - 1. Types of Virtualization
 - 2. Benefits and Capabilities
 - 3. Physical vs. Virtual
 - 4. Virtualization of Desktops
 - 5. The Jefferson College lab environment

- B. Hypervisors
 - 1. Bare-metal installations vs. host-based
 - 2. VMware Workstation and vSphere environment
 - 3. NTP, DNS and DHCP in virtualized environments
 - 4. Lab 1. Installation of ESXi

- C. Hypervisor Networks
 - 1. VM networks
 - 2. Storage networks
 - 3. Host communications
 - 4. Lab 2. Configuring ESXi networking

- D. Virtual Machines
 - 1. Understanding VMs
 - 2. Required components
 - 3. Lab 3. Creating Windows VM
 - 4. VM management and configurations
 - 5. VM migrations, clones, templates and backup
 - 6. VM networks and configurations
 - 7. Lab 4. Installation of iSCSI FreeNAS VM
 - 8. Lab 5. Installation of Openfiler VM

- E. Datastores
 - 1. Storage Area Networks (SAN)
 - 2. IP SAN
 - 3. Network Attached Storage (NAS)
 - 4. Lab 6. Configure iSCSI and MS iSCSI Initiator
 - 5. Lab 7. Configure NFS datastore on ESXi

- F. Cloud Computing and Virtualization
 - 1. Host Clusters
 - 2. Storage Virtualization
 - 3. VM clusters

- G. Academic Environment and Virtualization
 - 1. VMware Academy
 - 2. Information Storage and Management class
 - 3. Hardware and Software
 - 4. Benefits and Challenges

IV. METHOD(S) OF INSTRUCTION

- A. Lecture
- B. Group
- C. Collaboration
- D. Hands-On Lab Work

V. REQUIRED TEXTBOOK(S)

VCA-DCV Official Cert Guide: VMware Certified Associate - Data Center Virtualization (Current Edition) VMware Press
VMware vCloud Architecture Toolkit (vCAT): Technical and Operational Guidance for Cloud Success (Current Edition) VMware Press

VI. REQUIRED MATERIALS

Storage medium to save files. IE. USB Flash drive or Google Drive

VII. SUPPLEMENTAL REFERENCES

None

VIII. METHOD OF EVALUATION (*basis for determining course grade*)

- A. Participation: 15%
- B. Hands-On Exercises: 40%
- C. Quizzes/Exams: 40%
- D. Certification Exams (Pass/Fail): 5%

IX. ADA AA STATEMENT

Any student requiring special accommodations should inform the instructor and the Coordinator of Disability Support Services (Technology Center 101; phone 636-481-3169).

X. ACADEMIC HONESTY STATEMENT

All students are responsible for complying with campus policies as stated in the Student Handbook (see College website, <http://www.jeffco.edu>).

XI. ATTENDANCE STATEMENT

Regular and punctual attendance is expected of all students. Any one of these four options may result in the student being removed from the class and an administrative withdrawal being processed: (1) Student fails to begin class; (2) Student ceases participation for at least two consecutive weeks; (3) Student misses 15 percent or more of the coursework; and/or (4) Student misses 15 percent or more of the course as defined by the instructor. Students earn their financial aid by regularly attending and actively participating in their coursework. If a student does not actively participate, he/she may have to return financial aid funds. Consult the College Catalog or a Student Financial Services representative for more details.

XII. OUTSIDE OF CLASS ACADEMICALLY RELATED ACTIVITIES

The U.S. Department of Education mandates that students be made aware of expectations regarding coursework to be completed outside the classroom. Students are expected to spend substantial time outside of class meetings engaging in academically related activities such as reading, studying, and completing assignments. Specifically, time spent on academically related activities outside of class combined with time spent in class meetings is expected to be a minimum of 37.5 hours over the duration of the term for each credit hour.