Computer Virtualization (ITNW 1313)

Credit: 3 semester credit hours (2 hours lecture, 4 hours lab)

Prerequisite/Co-requisite: None

Course Description
Implement and support virtualization of clients of servers in a networked computing environment. This course explores installation, configuration, and management of computer virtualization workstation and servers.

Required Textbook and Materials
1. *Windows Server 2012 Hyper-V Installation and Configuration Guide*, by Aidan Finn, Patrick Lownds, Michel Luescher, Damian Flynn, Wiley, 2013.

    a. ISBN number for print book is 978-1-118-48649-8

    b. ISBN number for E-book is 978-1-118-65143-8

2. Computer Networking and Troubleshooting Technology students are required to have one portable external Hard Drive with a capacity of 500GB or larger to be used for the duration of the time to complete their respective degree.

Course Objectives
Upon completion of this course, the student will be able to:

1. Install and configure virtual machine managers.

2. Create and network virtual machines.

3. Set priorities for accessing resources.

4. Move and clone virtual machines.

5. Ensure high availability for applications within virtual machines.

Course Outline
A. Introducing Windows Server 2012 Hyper-V
1. Virtualization and Cloud Computing
2. Windows Server Hyper-V
3. Licensing Windows Server 2012 in Virtualization
4. VMware
5. Other Essential Knowledge

B. Deploying Hyper-V
1. Preparing a Hyper-V Deployment
2. Building the First Hyper-V Host
3. Managing Hyper-V
4. Upgrading Hyper-V

C. Managing Virtual Machines
1. Creating Virtual Machines
2. Designing Virtual Machines
3. Performing Virtual Machine Operations
4. Installing Operating Systems and Applications

D. Networking

Approved 1/2014

1. Basic Hyper-V Networking
2. Networking Hardware Enhancements
3. Advanced Networking

E. Cloud Computing
   1. Clouds, Tenants, and Segregation
   2. Microsoft Network Virtualization
   3. PVLANs
   4. Port Access Control Lists
   5. Hyper-V Virtual Machine Metrics

F. Microsoft iSCSI Software Target
   1. Introducing the Microsoft iSCSI Software Target
   2. Building the ISCSI Target
   3. Managing the iSCSI Target Server
   4. Migrating

G. Using File Servers
   1. Introducing Scale-Out File Servers
   2. Installing and Configuring Scale-Out File Servers
   3. Windows Server 2012 SMB PowerShell
   4. Windows Server 2012 Hyper-V over SMB 3.0
   5. Troubleshooting Scale-Out File Servers

H. Building Hyper-V Clusters
   1. Introduction to Building Hyper-V Clusters
   2. Active Directory Integration
   3. Cluster Shared Volumes
   4. BitLocker
   5. Cluster-Aware Updating
   6. Highly Available Virtual Machine
   7. Virtual Machine Mobility

I. Virtual SAN Storage and Guest Clustering

1. Introduction to Virtual SAN Storage
2. Guest Clustering
3. Virtual Machine Monitoring

J. Backup and Recovery
   1. How Backup Works with Hyper-V
   2. Improvements in Widows Server 2012 Hyper-V Backup
   3. Using Windows Server Backup
   4. The Impact of Backup on the Network

K. Disaster Recovery
   1. Introducing Disater Recovery
   2. DR Architecture for Windows Server 2012 Hyper-V
   3. Implementation of a Hyper-V Multi-site Cluster

L. Hyper-V Replica
   1. Introducing Hyper-V Replica
   2. Enabling Hyper-V Replica between Nonclustered Hosts
   3. Enabling Virtual Machine Replication
   4. Using Authentication with Certificates
   5. Using Advanced Authorization and Storage
   6. Using Hyper-V Replica with Clusters
   7. Exploring Hyper-V Replica in Greater Detail
   8. Managing Hyper-V Replica
   9. Setting Up Failover Networking
   10. Failing Over Virtual Machines

M. Using Hyper-V for Virtual Desktop Infrastructure
   1. Using Virtual Desktops, the Modern Work Style
   2. Building a Microsoft VDI Environment

ITNW 1370
Course Syllabus

Grade Scale
90 – 100	A
80 – 89	B
70 – 79	C
60 – 69	D
0 – 59	F

Course Evaluation
Final grades will be calculated according to the following criteria:

1. Labs	25%
2. Study Guides	10%
3. Chapter Tests	35%
4. Final Exam	30%

Course Requirements
1. Demonstrate proficiency through hands-on labs as assigned.
2. Completion of Study Guides as assigned.

Course Policies
1. No food, drinks, or use of tobacco products in class.
2. Beepers, telephones, headphones, and any other electronic devices must be turned off while in class.
3. Do not bring children to class.
4. No late assignments will be accepted.
5. Certification. If a student passes the certification test that is associated with this class, you will receive an "A" on the final exam and credit for 25% of your labs. If you have missed a previous test, you must still take the final exam to substitute for that grade.
6. Attendance Policy. Three absences are allowed. If a student is tardy to class or departs early three (3) times, it will be equal to one (1) absence. Each absence beyond three absences will result in a 2 point deduction from your final grade.
7. If you wish to drop a course, the student is responsible for initiating and completing the drop process. If you stop coming to class and fail to drop the course, you will earn an 'F' in the course.
8. Labs. Due dates will be announced by the instructor.
9. Tools. Return all tools and/or software to their designated place.
10. A grade of 'C' or better must be earned in this course for credit toward degree requirement.
11. Additional class policies as defined by the individual course instructor.

Disabilities Statement

The Americans with Disabilities Act of 1992 and Section 504 of the Rehabilitation Act of 1973 are federal anti-discrimination statutes that provide comprehensive civil rights for persons with disabilities. Among other things, these statutes require that all students with documented disabilities be guaranteed a learning environment that provides for reasonable accommodations for their disabilities. If you believe you have a disability requiring an accommodation, please contact the Special Populations Coordinator at (409) 880-1737 or visit the office in Student Services, Cecil Beeson Building.

Course Schedule

Week of	Topic	Reference
Week 1	Syllabus and policies Course Introduction Chapter 1: Introducing Windows Server 2012 Hyper-V	pp. 3-32
Week 2	Chapter 2: Deploying Hyper-V	pp. 33-70
Week 3	Chapter 3: Managing Virtual Machines	pp. 71-152
Week 4	Chapter 4: Networking	pp. 155-218
Week 5	Chapter 5: Cloud Computing	pp. 219-272
Week 6	Chapter 6: Microsoft iSCSI Software Target	pp. 275-296
Week 7	Chapter 7: Using File Servers	pp. 297-334
Week 8	Chapter 8: Building Hyper-V Clusters	pp. 335-378
Week 9	Chapter 9: Virtual SAN Storage and Guest Clustering	pp. 379-400
Week 10	Chapter 9: Virtual SAN Storage and Guest Clustering	pp. 379-400
Week 11	Chapter 10: Backup and Recovery	pp. 403-430
Week 12	Chapter 11: Disaster Recovery	pp. 431-468
Week 13	Chapter 12: Hyper-V Replica	pp. 469-520
Week 14	Chapter 12: Hyper-V Replica	pp. 469-520
Week 15	Chapter 13: Using Hyper-V for Virtual Desktop Infrastructure	pp. 521-542
Week 16	Final Exam	Comprehensive

Contact Information:

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Additional Course Policies

- Lab Grading. You must answer all questions in the assigned labs, as well as any review questions at the end of the lab. Labs are submitted through Blackboard and must be turned in on or before the due date. 5 points will be deducted for each question in the lab that is not answered and 7 points will be deducted for each review question that is not answered. If none of the questions are answered then the lab will receive a '0'. Labs that are not turned in will receive a '0'. Do not do the lab challenges or the troubleshooting labs.