COURSE OUTLINE: NASA105 - VIRTUAL INFRA

Prepared: Michael Wood
Approved: Corey Meunier, Dean, Technology, Trades, and Apprenticeship

Course Code: Title	NASA105: VIRTUALIZATION INFRASTRUCTURE
Program Number: Name	2196: NETWRK ARCH & SEC AN
Department:	COMPUTER STUDIES
Academic Year:	2023-2024
Course Description:	This course will cover the various technologies and business models related to virtualization and cloud computing. Students will deploy and manage a virtual infrastructure, taking into account the security considerations. Specific topics will include active directory integration, network security policies, firewall configuration and effective use of privileges, roles and permissions.
Total Credits:	5
Hours/Week:	5
Total Hours:	70
Prerequisites:	There are no pre-requisites for this course.
Corequisites:	There are no co-requisites for this course.
Vocational Learning Outcomes (VLO's) addressed in this course: **Please refer to program web page for a complete listing of program outcomes where applicable.**	**2196 - NETWRK ARCH & SEC AN** VLO 1 Design an enterprise network by applying knowledge of networking and routing protocols. VLO 3 Develop a security architecture plan to incorporate both perimeter and endpoint security controls and devices to provide layers of security. VLO 6 Design and implement a virtualization and cloud computing focused infrastructure specifically addressing security risks associated with incorporating virtualization into an organizations infrastructure.
Essential Employability Skills (EES) addressed in this course:	EES 4 Apply a systematic approach to solve problems. EES 5 Use a variety of thinking skills to anticipate and solve problems. EES 6 Locate, select, organize, and document information using appropriate technology and information systems. EES 7 Analyze, evaluate, and apply relevant information from a variety of sources. EES 9 Interact with others in groups or teams that contribute to effective working relationships and the achievement of goals.
Course Evaluation:	Passing Grade: 50%, A minimum program GPA of 2.0 or higher where program specific standards exist is required for graduation.
Other Course Evaluation &	A+ = 90-100%

Assessment Requirements:

A = 80-89%
B = 70-79%
C = 60-69%
D = 50-59%
F < 50%

Students are expected to be present to write all tests in class, unless otherwise specified. If a student is unable to write a test due to illness or a legitimate emergency, that student must contact the professor prior to class and provide reasoning. Should the student fail to contact the professor, the student shall receive a grade of zero on the test.

If a student is not present 10 minutes after the test begins, the student will be considered absent and will not be given the privilege of writing the test.
Students exhibiting academic dishonesty during a test will receive an automatic zero. Please refer to the College Academic Dishonesty Policy for further information.

In order to qualify to write a missed test, the student shall have:
a.) attended at least 75% of the classes to-date.
b.) provide the professor an acceptable explanation for his/her absence.
c.) be granted permission by the professor.

NOTE: The missed test that has met the above criteria will be an end-of-semester test.
Labs / assignments are due on the due-date indicated by the professor. Notice by the professor will be written on the labs / assignments and verbally announced in the class. Labs and assignments that are deemed late will have the following penalty: 1 day late - 10% reduction, 2 days late, 20% reduction, 3 days late, 30% reduction. After 3 days, no late assignments and labs will be accepted. It is the responsibility of the student who has missed a class to contact the professor immediately to obtain the lab / assignment. Students are responsible for doing their own work. Labs / assignments that are handed in and are deemed identical or near identical in content may constitute academic dishonesty and result in a zero grade.

Students are expected to be present to write in-classroom quizzes. There are no make-up options for missed in-class quizzes.

Students have the right to learn in an environment that is distraction-free, therefore, everyone is expected to arrive on-time in class. Should lectures become distracted due to students walking in late, the professor may deny entry until the 1st break period, which is 50 minutes into the class or until that component of the lecture is complete.

The total overall average of test scores combined must be 50% or higher in order to qualify to pass this course. In addition, combined tests, Labs / Assignments total grade must be 50% or higher.

Course Outcomes and Learning Objectives:

Course Outcome 1	Learning Objectives for Course Outcome 1
1. Understand the various types of virtualization technologies and where to apply them in an organization.	1.1 hypervisors 1.2 virtual servers 1.3 virtual networks 1.4 public cloud 1.5 private cloud 1.6 platform as a service 1.7 infrastructure as a service 1.8 software as a service

Course Outcome 2	Learning Objectives for Course Outcome 2
2. Understand how to install, configure and manage virtual servers.	2.1 installing the hypervisor 2.2 managing the hypervisor 2.3 configuring settings 2.4 host storage and networking
Course Outcome 3	**Learning Objectives for Course Outcome 3**
3. Understand how to install, configure, monitor and manage virtual machines and networks.	3.1 creating and configuring virtual hard disks 3.2 creating and configuring virtual machines 3.3 installing and importing virtual machines 3.4 managing virtual machine checkpoints 3.5 monitoring virtual resources
Course Outcome 4	**Learning Objectives for Course Outcome 4**
4. Understand how to create and configure virtual machine networks.	4.1 creating and using virtual switches 4.2 advanced networking features 4.3 configuring and using network virtualization
Course Outcome 5	**Learning Objectives for Course Outcome 5**
5. Understand the virtualization tools that allow for high availability and redundancy.	5.1 providing high availability and redundancy for virtualization 5.2 implementing virtual machine movement 5.3 implementing and managing virtual machine replication
Course Outcome 6	**Learning Objectives for Course Outcome 6**
6. Understand how to implement fail-over clustering with shared storage.	6.1 configuring and using shared storage 6.2 implementing and managing failover clustering
Course Outcome 7	**Learning Objectives for Course Outcome 7**
7. Understand how to install and configure and use System Center Virtual Machine Manager	7.1 integrating system center and server virtualization 7.2 overview of system center virtual machine manager 7.3 installing system center virtual machine manager 7.4 adding hosts and managing host groups 7.5 managing networking infrastructure 7.6 managing storage infrastructure 7.7 managing infrastructure updates 7.8 clustering 7.9 creating virtual machines 7.10 cloning & converting virtual machines
Course Outcome 8	**Learning Objectives for Course Outcome 8**
8. Understand how to produce and manage clouds.	8.1 introduction to clouds 8.2 creating and managing a cloud 8.3 working with user roles in virtual machine manager 8.4 azure 8.5 windows azure pack (on-prem azure)
Course Outcome 9	**Learning Objectives for Course Outcome 9**
9. Understand how to manage services.	9.1 understanding Services in Virtual Machine Manager 9.2 creating and Managing Services in VMM

	9.3 using System Center App Controller
Course Outcome 10	**Learning Objectives for Course Outcome 10**
10. Understand how to protect and monitor virtualization infrastructure	10.1 protecting virtualization infrastructure 10.2 monitoring and reporting

Evaluation Process and Grading System:

Evaluation Type	Evaluation Weight
Labs	40%
Test #1	30%
Test #2	30%

Date: August 21, 2023

Addendum: Please refer to the course outline addendum on the Learning Management System for further information.