SYLLABUS

DIVISION: Business and Engineering Technology **REVISED:** SUMMER 2014

CURRICULA IN WHICH COURSE IS TAUGHT: IST, Information Systems Technology

COURSE NUMBER AND TITLE: ITN 255 – Virtual Infrastructure: Deployment, Security, and Analysis (VMware)

CREDIT HOURS: 4 **HOURS/WK LEC:** 3 **HOURS/WK LAB:** 2 **LEC/LAB COMB:** 5

I. CATALOG DESCRIPTION: ITN-255 - Focuses on the deployment, security, and analysis of the virtual infrastructure, including scripted installations, advanced virtual switching for security, server monitoring for health and resource management, high-availability management, system backups, and fault analysis. Lecture 3 hours. Laboratory 2 hours. Total 5 hours per week. 4 credits

II. RELATIONSHIP OF THE COURSE TO CURRICULA OBJECTIVES: ITN 255 will address the following Information Technology Outcomes:

- Implement Information Technology skills required by software applications.
- Apply methodologies to stay current in IT offerings, trends and certifications.
- Apply analytical and problem solving skills for computer system design, planning and support.
- Design, code, test, debug, and document software needed for computer system implementation and maintenance.
- Apply current IT industry standards, protocols, and techniques.
- Use instructional applications and material which could lead towards industry certification.

Please Note: The overall Learner Outcomes from all of the course requirements for the A.A.S. Degrees in IT are more in-depth than those of the Career Studies Certificates. However, the IT courses that are the same in both the A.A.S. Degrees and the Certificate Programs carry the same Learner Outcomes and are identical in content. Please review the DCC Catalog or visit the DCC Web Site for more details.

III. REQUIRED BACKGROUND: ITN-254 or approved by instructor

IV. COURSE CONTENT:

Module 1: Course Introduction
- Introductions and course logistics
- Course objectives

Module 2: Storage Optimization
- Diagnose storage access problems
- Understand how storage protocols, VMware vSphere® VMFS configuration, load balancing, and queuing affect performance
- Monitor key storage performance metrics
- Use vMA to manage virtual storage
- Troubleshoot common storage performance problems

Module 3: VMware Management Resources
- Configure vMA
- Understand the esxcli and vicfg commands
- Configure ESXi technical support mode and SSH access
- Understand important ESXi and vCenter Server log files

Module 4: CPU Optimization
- Understand CPU scheduler and other features that affect CPU performance

- Monitor key CPU performance metrics
- Troubleshoot common CPU performance problems

Module 5: Performance in a Virtualized Environment

- Understand the vSphere performance troubleshooting methodology
- Understand software and hardware virtualization techniques and their effects on performance
- Use vSphere performance monitoring tools

Module 6: Memory Optimization

- Understand memory reclamation techniques and over-commitment
- Monitor key memory performance metrics
- Troubleshoot common memory performance problems

Module 7: Network Scalability

- Create, configure, and manage vSphere distributed switches
- Migrate virtual machines from standard switches to distributed switches
- Understand distributed switch features such as PVLANs, VMware vSphere® Network I/O Control, port mirroring, and NetFlow

Module 8: Virtual Machine and Cluster Optimization

- Understand performance guidelines for virtual machines, resource allocation settings, VMware vSphere® Distributed Resource Scheduler™ clusters, resource pools, and VMware vSphere® High Availability admission control policies.
- Troubleshoot virtual machine power-on failures
- Troubleshoot vSphere cluster problems

Module 9: Network Optimization

- Understand performance features of network adapters
- Understand performance features of vSphere networking
- Monitor key network performance metrics
- Use vMA to manage virtual network configuration
- Troubleshoot common network performance problems

Module 10: Host and Management Scalability

- Understand how vCenter Linked Mode manages multiple vCenter Server inventories
- Explain VMware vSphere® Distributed Power Management™
- Use Host Profiles to manage ESXi configuration compliance
- Use VMware vSphere® PowerCLI™ to perform vSphere administrative tasks
- Use Image Builder to create an ESXi installation image
- Use vSphere Auto Deploy to provision ESXi hosts

Module 11: Storage Scalability

- Configure storage multipathing
- Understand vSphere storage APIs for array integration and storage awareness
- Explain profile-driven storage
- Add a storage policy to a virtual machine storage profile
- Describe VMware vSphere® Storage DRS™ operation
- Configure Storage DRS and VMware vSphere® Storage I/O Control

V. THE FOLLOWING GENERAL EDUCATION OBJECTIVES WILL BE ADDRESSED IN THIS COURSE. STUDENTS WILL:

X Communication
X Critical Thinking
Cultural and Social Understanding Information Literacy
X Personal Development
X Quantitative Reasoning
X Scientific Reasoning

VI. LEARNER OUTCOMES

VII. EVALUATION

Upon conclusion of this course the student will be able to define, discuss, and demonstrate knowledge in the following concepts.	
Configure VMware vSphere Management Assistant	Lab Exercise and test - Utilizing provided ESXi software have student configure the core components of ESXi 5 Server and demonstrate the necessity for the core services that are installed.
Manage VMware Monitoring Tools	Lab Exercise and test – Utilizing vMA have the student login and add their vCenter and ESXi Host. Have student use the ESXCLI commands and directions provided by their lab manual.
Install and Manage VMware Distributed Switches	Lab exercise and test – Have student login to ESXi server and create a distributed switch. Have the student follow the lab manual for modifications of this switch.
Configure VMware Port Mirroring	Lab exercise and test – After student has completed the previous lab assignment have the student create and manage Port Mirroring as instructed by the lab manual.
Configure VMware Profile-Driven Storage	Lab exercise and test – Have student add a Datastore for use by Policy Based Storage then have them use vSphere Storage vMotion to migrate a VM. Continue with this assignment having the student follow the lab manual which includes assigning storage policies to their assigned VM.
Configure VMware Data Clusters	Lab exercise and test – Have the student Create a Datastore cluster that is enabled by vSphere storage DRS. Have student follow the lab manual which includes evacuating a Datastore and run the vSphere Storage DRS and Apply Migration Recommendations.
Utilize vSphere PowerCLI	Lab exercise and test - Have the student define Variables, connect and disconnect from an ESXi host. Have the student follow the lab manual which includes retrieving information from virtual machine statistics.
Configure Host Profiles	Lab exercise and test – Have the student create and export host profile then select another host and import. Have the student follow the lab manual which includes initial remediation and Drift configurations.