

Digital & Information Technology Networking and Cybersecurity



CAE-CDE 2Y - National Centers of Academic
Excellence in Cyber Defense 2-Year Education

VMware vSphere: Install, Configure, Manage [V6.5] Course Syllabus Spring 2018

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Course Reference Number (CRN) 60597

Summary: - Formats: **Classroom**, **Lab**, **Live Online**
- Length: 16 weeks


















Overview:

VMware vSphere: Install, Configure, manage features intensive hands-on training that focuses on installing, configuring, and managing VMware vSphere® 6.5, which includes VMware ESXi™ 6.5 and VMware vCenter Server™ 6.5 This course prepares you to administer a vSphere infrastructure for an organization of any size and forms the foundation for most other VMware technologies in the software-defined data center.

- Objectives:
- Describe the software-defined data center
 - Deploy an ESXi host and create virtual machines
 - Describe vCenter Server architecture
 - Deploy a vCenter Server instance or VMware vCenter Server™ Appliance™
 - Use vCenter Server to manage an ESXi host
 - Configure and manage vSphere infrastructure with VMware vSphere® Client™ and VMware vSphere® Web Client
 - Configure virtual networks with vSphere standard switches
 - Use vCenter Server to manage various types of host storage: VMware vSphere® VMFS, NFS, virtual SAN, and Virtual Volumes
 - Manage virtual machines, templates, clones, and snapshots
 - Create a vApp
 - Describe and use the content library
 - Migrate virtual machines with VMware vSphere® vMotion®

- Use VMware vSphere® Storage vMotion® to migrate virtual machine storage
- Monitor resource usage and manage resource pools
- Use VMware vRealize™ Operations Manager™ to identify and solve issues through analytics and alerts
- Manage VMware vSphere® High Availability and VMware vSphere® Fault Tolerance
- Use VMware vSphere® Replication™ and VMware vSphere® Data Protection™ to replicate virtual machines and perform data recovery
- Use VMware vSphere® Distributed Resource Scheduler™ clusters to improve host scalability
- Use vSphere distributed switches to improve network scalability
- Use VMware vSphere® Update Manager™ to apply patches and perform basic troubleshooting of ESXi hosts, virtual machines, and vCenter Server operations

NETLAB+ provides remote access to physical lab equipment and curriculum. To access your Virtual Labs, you will need a user ID and password, assigned by your instructor or local system administrator. This will be provided the first week of class. Personal firewall software can interfere with this application. If you experience login or port test failures, please disable your firewall software to determine if this is causing the problem. Browser security settings can interfere with required features. It is recommended that you add the IP address (or host name) of this site to your browser's trusted site list. This application uses [Java™](#), JavaScript, Cookies, Popup Windows, and IFRAMES. Please adjust your browser settings accordingly.

System	Web Browser	Version	Status
 Windows	 Mozilla Firefox	3.6.15	 Supported
	 Internet Explorer	8.0.6	 Supported
	 Apple Safari	5.0.2	 Beta
	 Google Chrome	7.0.517	 Beta
 Mac	 Mozilla Firefox	3.6.15	 Supported
	 Apple Safari	5.0.2	 Beta
 Linux	 Mozilla Firefox	3.6.15	 Supported

Course Requirements, Policy, and Course Calendar

Instructor's Requirements

1. Adequate hardware including a 1 GHz or faster CPU, 4GB or more of RAM, graphics card with 128 MB of memory, 100 GB of disk storage space and handle multimedia items (sound and maybe a microphone [suggested but not required this semester]).
2. Windows 7, 8.1, or 10 operating system.
3. High speed Internet access required!

DE Course Orientation: Each student is expected to complete the Distance Education Department's orientation. You complete an orientation for each course you are taking. Click on the "Orientations" link on the Distance Education's home page <https://www.hccs.edu/online/>

Acceptance Guidelines: Not all people are well suited for independent study. A general set of guidelines is used to determine if you should be accepted into the Distance Education sections of ITNW1425.

These guidelines will require you to:

1. Be self-motivated or self-starter: This usually means having completed at least 6 credit hours of college and having a cumulative GPA of 2.5 or better. Exceptions must be approved by the instructor.
2. Meet the course prerequisites: This means being ready for ENGL1301 and MATH1314 (i.e. no remediation needed) and high school computer literacy or equivalent.
3. Already be familiar with microcomputers by having used:
 - a. Windows XP, Windows, and or Windows 7, Windows 8.1, Windows 10, Linux, (any of these)
 - b. An Internet browser
 - c. Files and folders. This means that you should be able to create, rename, delete, locate, move and copy files and folders. You should also be familiar switching between the icon view and the details view in My Computer/Windows Explorer. A basic understanding of the above file management skills is required.
4. Have access to computer resources:
 - a. either, have adequate hardware with software installed on a computer at home or work including adequate Internet access with DSL or cable speed
 - b. Or, be able and willing to use open lab times provided by the college to complete the course.

Please note, [the network or computer going down the night before an assignment is due is NOT a valid excuse. Assignments have ample lead time before the Cut off Dates to allow for these types of situations. Start work early and submit your work early and you should not have a problem.](#)

Instructor Grading Criteria: Student Attendance/Participation is Mandatory: As a Distance Education section of this topic, you must make satisfactory progress in this course. Students may be withdrawn if the student misses turning in assignments or quizzes that total to more than 89 points (which is more than 12.5% of the course work prior to the Final Exam). Contact the instructor if you are having a problem. If you decide to quit participating in the course before the Last Day for Administrative/Student Withdrawals, you should see the Registrar and properly withdraw so that you will receive a W. After the withdrawal date deadline, the instructor is not able to withdraw you. If you quit participating in the course after the Last Day for Administrative/Student Withdrawals, you will receive an F or FX. This will apply to all students. Incomplete grades are rarely given. Thus, as your Professor, I expect to have regular contact with you during the semester. Most of this contact will be electronically within the Canvas environment. Most interaction will be via the Announcements, Discussions and Mail tools and the grading of assignments.

Professor Participation: I will normally enter the course via Canvas every business day (Monday thru Friday unless it's a Holiday), however for a variety of reasons (sick, out of town, computer broken, internet connection not working, etc.) I may not enter the course on a given day. Often, I will enter the course more than once on a business day. I will usually enter the course on Saturday morning, but not always. Sometimes, I will enter the course on Sunday. Thus, it might appear that you have 24/7 instructor response and you could wrongfully expect immediate response to all your needs. I will try to respond quickly, and you should normally have a response within 3 business days, so don't panic if you don't get a response in 30 minutes.

Instructors are usually allowed up to two weeks to grade assignments, however, I will try to grade lab assignments within 7 days after the "Due Date" for the assignment. In recent semesters, I have tried to grade all assignments within 2 to 3 days after they are submitted by students. All quizzes are self-grading and students can see their results immediately. I will read all "Mail" every time I enter the course and normally will respond that same day. Occasionally a student's question requires a couple of days for me to research his question to allow me to formulate a good (correct) response.

Final Grade: Your final grade will be posted within your Canvas course; however official grades are provided to students by the Registrar and are available shortly after the end of the semester. There is no other official method of posting a student's

final grade. Final grades will not be given over the telephone by either the professor or any HCCS employee. If you need an official transcript, see the registrar and request a transcript be sent after posting of the grades for the semester. During the course, your progress (assignments and quiz scores) will be reported to you via the “Grades” feature within Canvas. You should check this regularly to confirm your progress in the course is current. US Mailing Address, Telephone and Email Address: Make sure that your address is correct on your student ID card and that HCC has your correct telephone and email information.

HCC Grading Scale

Grade	GPA Points
A = 100- 90:	4 points per semester hour
B = 89 - 80:	3 points per semester hour
C = 79 - 70:	2 points per semester hour
D = 69 - 60:	1 points per semester hour
59 and below = F	0 points per semester hour
IP (In Progress)	0 points per semester hour
W (Withdrawn)	0 points per semester hour
I (Incomplete)	0 points per semester hour
AUD (Audit)	0 points per semester hour

IP (In Progress) is given only in certain developmental courses. The student must re-enroll to receive credit. COM (Completed) is given in non-credit and continuing education courses. To compute grade point average (GPA), divide the total grade points by the total number of semester hours attempted. The grades "IP," "COM" and "I" do not affect GPA.

Class Schedule: The below due dates are established to prevent “Procrastination” on your part. It is “strongly suggested” that students set a regular study schedule. This will allow them to complete materials on or before the “Due Date”. Students that work ahead will be able to handle unexpected situations that will occur in their life. Not working ahead might cause them to miss the due date for a Learning Module. Assignments not received, and quizzes not taken by the “Due Date” for a Learning Module will not be received and will be given the grade of zero.

Assignments must be submitted, and quizzes taken by 11:55:00 PM (on OUR CLOCK) on the “Due Date” when the module MUST be submitted. Remember, you can always turn in assignments before the “Due Date”, but never after the “Due Date”

If you are having problems completing course materials on time (by the “Due Date”), chat with the instructor. If you have over scheduled your life (working 40 hours a week and taking 15 credit hours of college instruction), have computer problems (my computer is broke and I don’t know when it will get fixed) or don’t have a textbook (too poor to buy one until payday) – DON’T BE SURPRISED IF THE INSTRUCTOR SIMPLY SAYS, “You should withdraw from the course”. In other words, you might not get much sympathy and the instructor will expect materials to be submitted by the “Due Date”. However, under unusually circumstances (death or illness in the family and other items that greatly disrupt your life), the instructor might be willing to accept late materials if you make contact in advance!

The Final Exam Distance Ed classes require an on-campus visit. Final Examination is scheduled for: TBA, at the J. Don Boney building on the Central Campus which is located at 1300 Holman Room JDB206. The exam will be limited to 2 hours unless a student has ADA accommodations. If you are an ADA student and are to receive 3 hours for testing time, then you must arrive early. Potential conflicts should be resolved individually with your Instructor. You must pass the final examination to pass this course. Each quiz and exam is composed to test knowledge and skills acquired through reading, labs, discussions, videos, and participation. Exams are an evaluation of your individual knowledge and skill acquired.

The course grading scale:

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COURSE GRADING:	
20%	Final Exam
20%	Mid-Term Exam
20%	Discussions
40%	Labs
100%	Total

Week 1-16	Due dates	Learning Modules and associated learning outcomes	NSA/KU Topics
Week 1	TBA	Classes Begins – Introduction Module 1 Chapter 1	
Week 1	TBA	1 Course Introduction <ul style="list-style-type: none"> ○ Introductions and course logistics ○ Course objectives ○ References and resources 	
Week 2	TBA	2 Software-Defined Data Center <ul style="list-style-type: none"> ○ Introduce components of the software-defined data center ○ Describe where vSphere fits into the cloud architecture ○ Install and use vSphere Client ○ Overview of ESXi 	
Week 3	TBA	3 Creating Virtual Machines <ul style="list-style-type: none"> ○ Introduce virtual machines, virtual machine hardware, and virtual machine files ○ Create and work with virtual machines and templates 	
Week 4	TBA	4 vCenter Server	

Week 5	TBA	<ul style="list-style-type: none"> ○ Introduce the vCenter Server architecture ○ Deploy and configure vCenter Server Appliance ○ Use vSphere Web Client ○ Manage vCenter Server inventory objects and licenses <p>5 Configuring and Managing Virtual Networks</p>	
Week 6	TBA	<ul style="list-style-type: none"> ○ Describe, create, and manage standard switches ○ Configure virtual switch security and load-balancing policies ○ Create, configure, and manage vSphere distributed switches, network connections, and port groups <p>6 Configuring and Managing Virtual Storage</p>	
Week 7	TBA	<ul style="list-style-type: none"> ○ Introduce storage protocols and storage device types ○ Discuss ESXi hosts using iSCSI and NFS storage ○ Create and manage VMFS and NFS datastores ○ Introduce VMware Virtual SAN™ ○ Introduce Virtual Volumes <p>7 Virtual Machine Management</p>	
Week 8	TBA	<ul style="list-style-type: none"> ○ Use templates and cloning to deploy new virtual machines ○ Modify and manage virtual machines ○ Perform vSphere vMotion and vSphere Storage vMotion migrations ○ Create and manage virtual machine snapshots ○ Create vApps ○ Introduce the types of content libraries and how to deploy and use them <p>8 Resource Management and Monitoring</p>	
		<ul style="list-style-type: none"> ○ Introduce virtual CPU and memory concepts ○ Configure and manage resource pools 	

Week 9	TBA	<ul style="list-style-type: none"> ○ Describe methods for optimizing CPU and memory usage ○ Use various tools to monitor resource usage ○ Create and use alarms to report certain conditions or events ○ Identify and troubleshoot virtual machine resource issues ○ Introduce vRealize Operations Manager for data center monitoring and management <p>9 vSphere HA and vSphere Fault Tolerance</p>	
Week 10	TBA	<ul style="list-style-type: none"> ○ Explain the vSphere HA architecture ○ Configure and manage a vSphere HA cluster ○ Use vSphere HA advanced parameters ○ Introduce vSphere Fault Tolerance ○ Enable vSphere Fault Tolerance on virtual machines ○ Introduce vSphere Replication ○ Use vSphere Data Protection to back up and restore data <p>10 Host Scalability</p>	
Week 11	TBA	<ul style="list-style-type: none"> ○ Describe the functions and benefits of a vSphere DRS cluster ○ Configure and manage a vSphere DRS cluster ○ Work with affinity and anti-affinity rules ○ Use vSphere HA and vSphere DRS together for business continuity <p>11 vSphere Update Manager and Host Maintenance</p>	
Week 12	TBA	<ul style="list-style-type: none"> ○ Use vSphere Update Manager to manage ESXi patching ○ Install vSphere Update Manager and the vSphere Update Manager plug-in ○ Create patch baselines ○ Use host profiles to manage host configuration compliance ○ Scan and remediate hosts 	

		<p>12 Installing vSphere Components</p> <ul style="list-style-type: none"> ○ Install ESXi ○ Introduce vCenter Server deployment options ○ Describe vCenter Server hardware, software, and database requirements ○ Discuss installation of vCenter Server Appliance and a vCenter Server instance ○ Demonstrate vCenter Server installation 	
Week 13- Week 15	TBA	Catch Up review for final Exam	
Week 16	TBA	Final Examination On Campus TBA 1:00-7:00pm JDB206 Central College	

Student Assignments: Reading, Labs, Discussions, Videos, Quizzes, Exams. Refer to the Canvas Online course site for details.

Student Assessments: Labs, Quizzes, Exams, discussions.

HCC Policies

For detailed information see Student Handbook at <https://www.hccs.edu/resources-for/current-students/student-handbook/>

For online classes see also the online student handbook <https://www.hccs.edu/resources-for/current-students/student-handbook/FINAL-HCCStudentHandbook.pdf>

HCC Policy -- Class Attendance

Students are expected to attend class meetings on a regular basis and to participate in class and online activities. Students may be withdrawn administratively if they don't meet the State mandated attendance policy. You are responsible for materials covered during your absences. Class attendance is checked daily. Although it is your responsibility to drop a course for nonattendance, the instructor has the authority to drop you for excessive absences. For complete information regarding Houston Community College's policies on attendance, please refer to the HCC Student Handbook.

HCC Policy -- Course Withdrawal

If you feel that you cannot complete this course, you will need to withdraw from the course. (check HCCS Academic Calendar for any updates). Students must withdraw by the withdrawal deadline to receive a "W" on a transcript. Final withdrawal deadlines vary each semester and/or depending on class length, please visit the online Academic Calendar, any HCC Registration Office, or any HCC advisor to determine class withdrawal deadlines.

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Be certain you understand HCC policies about dropping a course and consult with a counselor/advisor to determine if withdrawing is in your best interest. It is your responsibility to withdraw officially from a class and prevent an "F" from appearing on your transcript. Senate Bill 1231 and limits the number of W's a student can have to 6 classes over the course of their entire academic career. This policy is effective for students entering higher education for the first time in fall 2007 and subsequent terms. Withdrawals accumulated at any other Texas public higher education institution count toward the 6-course total. Withdrawals for certain circumstances beyond the student's control may not be counted toward the 6-drop limit. In addition, withdrawing from a course may impact your financial aid award or eligibility. Contact the Financial Aid Office or website to learn more about the impact of withdrawing on financial aid. For complete information on HCC Course Withdrawal policy including the three-peat rule refer to the HCC Student Handbook.

HCC Eagle Early Alert

As your professor, I want you to know that HCC has processes for helping students who are struggling with meeting the demands of a college course. Emergency concerns will be reported promptly. After week three of a 12 or 16-week semester, all concerns that are not resolved after my initial notification to you, will be shared with an appropriate student services staff for further assistance.

Reasons for Eagle Early Alert referrals could include any of the following: • Evidence of Academic under-preparedness • Failed Major Test/Assignment • No Online Activities • Incomplete Homework • Missing Material or Textbook • Limited Computer Skills • Excessive Absences/Personal Issues

A referral to Eagle Early Alert indicates a concern about you and your progress that needs to be addressed to ensure successful completion of this course. If you are contacted by an Eagle Early Alert staff, or you see an Eagle Early Alert notice in your PeopleSoft "To Do List", please respond to the advisor/counselor, within 24-48 hours. After your visit with the advisor/counselor, please report back to me and share your plan for successful completion of this course.

HCC Policy -- Students Living Out of The HCC Service Area

Students living out of the HCC service area while enrolled in HCC online classes need to make special arrangements with their instructors to schedule their required proctored examinations. For more information visit <http://www.hccs.edu/online/proctoring-services/> or contact HCC Online division at <http://www.hccs.edu/online/>

HCC Policy -- Academic Honesty

A student who is academically dishonest is, by definition, not showing that the coursework has been learned, and that student is claiming an advantage not available to other students. The instructor is responsible for measuring each student's individual achievements and for ensuring that all students compete on a level playing field. Thus, in our system, the instructor has teaching, grading, and enforcement roles. You are expected to be familiar with the University's Policy on Academic Honesty, found in the catalog. What that means is: If you are charged with an offense, pleading ignorance of the rules will not help you. Students are responsible for conducting themselves with honor and integrity in fulfilling course requirements. Penalties and/or disciplinary proceedings may be initiated by College System officials against a student accused of scholastic dishonesty. "Scholastic dishonesty": includes, but is not limited to, cheating on a test, plagiarism, and collusion.

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For more information on HCC policy on academic honesty refer to the HCC Student Handbook.

HCC Policy Statement-- Accommodations Due to a Qualified Disability

HCC strives to make all learning experiences as accessible as possible. If you anticipate or experience academic barriers based on your disability (including mental health, chronic or temporary medical conditions), please meet with a campus Abilities Counselor as soon as possible to establish reasonable accommodations. Reasonable accommodations are established through an interactive process between you, your instructor(s) and Ability Services. It is the policy and practice of HCC to create inclusive and accessible learning environments consistent with federal and state law.

For more information, please go to <https://www.hccs.edu/programs/adult-education/txchse/disability-accommodations/>

HCC Policy --Title IX

Houston Community College is committed to cultivating an environment free from inappropriate conduct of a sexual or gender-based nature including sex discrimination, sexual assault, sexual harassment, and sexual violence. Sex discrimination includes all forms of sexual and gender-based misconduct and violates an individual's fundamental rights and personal dignity. Title IX prohibits discrimination based on sex including pregnancy and parental status-in educational programs and activities. If you require an accommodation due to pregnancy, please contact an Abilities Services Counselor. The Director of EEO/Compliance is designated as the Title IX Coordinator and Section 504 Coordinator. All inquiries concerning HCC policies, compliance with applicable laws, statutes, and regulations (such as Title VI, Title IX, and Section 504), and complaints may be directed to:

David Cross Director EEO/Compliance Office of Institutional Equity & Diversity 3100 Main (713) 718-8271
Houston, TX 77266-7517 or Institutional.Equity@hccs.edu

<https://www.hccs.edu/departments/institutional-equity/>

HCC Policy—Campus Carry

At HCC the safety of our students, staff, and faculty is our priority. As of August 1, 2017, Houston Community College is subject to the Campus Carry Law (SB11 2015). For more information, visit the HCC Campus Carry web page at <https://www.hccs.edu/departments/police/campus-carry/>

HCC Policy Statement: Basic Needs

Any student who faces challenges securing their food or housing and believes this may affect their performance in the course is urged to contact the Dean of Students for support. Furthermore, please notify the professor if you are comfortable in doing so. This will enable us to provide any resources that HCC may possess.

HCC Policy — Vaccination against bacterial meningitis

Texas Senate Bill 1107, passed in May 2011, requires that new HCC students and former HCC students returning after an absence of at least one fall or spring semester who are under the age of 22 are required to present a physician-signed certificate showing they have been vaccinated against bacterial meningitis.

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For more information and the list of exemptions, please visit the HCC page at: <https://www.hccs.edu/applying-and-paying/meningitis/>

EGLS3 -- Evaluation for Greater Learning Student Survey System

At Houston Community College, professors believe that thoughtful student feedback is necessary to improve teaching and learning. During a designated time, you will be asked to answer a short online survey of research-based questions related to instruction. The anonymous results of the survey will be made available to your professors and division chairs for continual improvement of instruction. Look for the survey as part of the Houston Community College Student System online near the end of the term.