

## ITS446: Securing Virtual and Cloud Systems

**Credit Hours:** 3

**Contact Hours:** This is a 3-credit course, offered in accelerated format. This means that 16 weeks of material is covered in 8 weeks. The exact number of hours per week that you can expect to spend on each course will vary based upon the weekly coursework, as well as your study style and preferences. You should plan to spend 14-20 hours per week in each course reading material, interacting on the discussion boards, writing papers, completing projects, and doing research.

### Faculty Information



Faculty contact information and office hours can be found on the faculty profile page.

### Course Description and Outcomes



#### Course Description:

Students in this course are introduced to the concepts of virtualization security including the types of virtualization, the importance of securing virtualized networks, and discussions of the various virtualization program offerings. Additionally, students in this course are introduced to the concepts of cloud security. Students will understand the strategy for securely implementing network policies and integrating virtual networks into the existing physical infrastructure. Students will also gain an understanding of how to analyze and implement security for public and private clouds. In this course, students will learn about implementations of effective practices for securing virtual machines without creating additional operational overhead for administrators. In addition, students will learn how to protect networks, operating systems, and applications in various cloud deployments.

#### Course Overview:

This course is designed to expose students to various concepts of virtualization security. This course explores the systematic lockdown and application of security-related technical and procedural controls for all components of a virtualization infrastructure. This course is important because the world is quickly changing and people are starting to leverage both internal and external clouds, which tend to make heavy use of virtualization technology. As customers start increasing the use of these virtual environments, the need for a solid grasp on how to strengthen security of this technology will increase as well. This course hopes to increase your knowledge of best practices and specific technical controls for securing virtual infrastructures. Additionally, this course will expose you to a wide range of components ranging from virtual networks to hypervisor platforms and virtual machines.

## Course Learning Outcomes:

1. Describe essential concepts, issues, and challenges in developing and securing today's cloud computing platforms and applications.
2. Compare and contrast vSphere and Hyper-V native security.
3. Identify Secure Cloud Computing Concepts, Functions, Data Management, and Computing Guidelines.
4. Evaluate the use of Secure Cloud Computing Products.
5. Compare and contrast — Service-Oriented Computing and Security, Semantic Web Service and Security, and Specialized Web Services and Security.
6. Discuss Security as a Service.
7. Describe technologies, best practices, and strategies used for securing virtual environments.

## Participation & Attendance



Prompt and consistent attendance in your online courses is essential for your success at CSU-Global Campus. Failure to verify your attendance within the first 7 days of this course may result in your withdrawal. If for some reason you would like to drop a course, please contact your advisor.

Online classes have deadlines, assignments, and participation requirements just like on-campus classes. Budget your time carefully and keep an open line of communication with your instructor. If you are having technical problems, problems with your assignments, or other problems that are impeding your progress, let your instructor know as soon as possible.

## Course Materials



### Required:

Shackleford, D. (2013). *Virtualization security: Protecting virtualized environments*. Hoboken, NJ: Wiley. ISBN-13: 978-1118288122

### Suggested:

**NOTE:** All non-textbook required readings and materials necessary to complete assignments, discussions, and/or supplemental or required exercises are provided within the course itself. Please read through each course module carefully.

## Course Schedule



### Due Dates

The Academic Week at CSU-Global begins on Monday and ends the following Sunday.

- Discussion Boards: The original post must be completed by Thursday at 11:59 p.m. MT and Peer Responses posted by Sunday 11:59 p.m. MT. Late posts may not be awarded points.

- Opening Exercises: Take the opening exercise before reading each week's content to see which areas you will need to focus on. You may take these exercises as many times as you need. The opening exercises will not affect your final grade.
- Mastery Exercises: Students may access and retake mastery exercises through the last day of class until they achieve the scores they desire.
- Critical Thinking Assignments: Assignments are due Sunday at 11:59 p.m. MT.

Week #	Readings	Assignments
1	<ul style="list-style-type: none"> <li>• Chapter 1 in <i>Virtualization security: Protecting virtualized environments</i></li> </ul>	<ul style="list-style-type: none"> <li>• Discussion (25 points)</li> <li>• Opening Exercise (0 points)</li> <li>• Mastery Exercise (10 points)</li> </ul>
2	<ul style="list-style-type: none"> <li>• Chapter 2 in <i>Virtualization security: Protecting virtualized environments</i></li> </ul>	<ul style="list-style-type: none"> <li>• Discussion (25 points)</li> <li>• Opening Exercise (0 points)</li> <li>• Mastery Exercise (10 points)</li> <li>• Critical Thinking (70 points)</li> </ul>
3	<ul style="list-style-type: none"> <li>• Chapters 3 &amp; 4 in <i>Virtualization security: Protecting virtualized environments</i></li> </ul>	<ul style="list-style-type: none"> <li>• Discussion (25 points)</li> <li>• Opening Exercise (0 points)</li> <li>• Mastery Exercise (10 points)</li> <li>• Critical Thinking (70 points)</li> <li>• Portfolio Project (80 Points)</li> </ul>
4	<ul style="list-style-type: none"> <li>• Chapters 5 &amp; 6 in <i>Virtualization security: Protecting virtualized environments</i></li> </ul>	<ul style="list-style-type: none"> <li>• Discussion (25 points)</li> <li>• Opening Exercise (0 points)</li> <li>• Mastery Exercise (10 points)</li> <li>• Critical Thinking (70 points)</li> </ul>
5	<ul style="list-style-type: none"> <li>• Chapters 7 &amp; 8 in <i>Virtualization security: Protecting virtualized environments</i></li> </ul>	<ul style="list-style-type: none"> <li>• Discussion (25 points)</li> <li>• Opening Exercise (0 points)</li> <li>• Mastery Exercise (10 points)</li> <li>• Critical Thinking (70 points)</li> <li>• Portfolio Project (80 Points)</li> </ul>
6	<ul style="list-style-type: none"> <li>• Chapter 9 in <i>Virtualization security: Protecting virtualized environments</i></li> </ul>	<ul style="list-style-type: none"> <li>• Discussion (25 points)</li> <li>• Opening Exercise (0 points)</li> <li>• Mastery Exercise (10 points)</li> <li>• Critical Thinking (90 points)</li> </ul>
7	<ul style="list-style-type: none"> <li>• Chapter 10 in <i>Virtualization security: Protecting virtualized environments</i></li> </ul>	<ul style="list-style-type: none"> <li>• Discussion (25 points)</li> <li>• Opening Exercise (0 points)</li> <li>• Mastery Exercise (10 points)</li> </ul>
8	<ul style="list-style-type: none"> <li>• Chapter 11 in <i>Virtualization security: Protecting virtualized environments</i></li> </ul>	<ul style="list-style-type: none"> <li>• Discussion (25 points)</li> <li>• Opening Exercise (0 points)</li> <li>• Mastery Exercise (10 points)</li> <li>• Portfolio (190 points)</li> </ul>

## Assignment Details



This course includes the following assignments/projects:

### Module 1

#### **Portfolio Project Reminder: Microsoft Virtualization Technologies Portfolio Project Overview**

For this course, you will only have one Portfolio Project option. Please review the description below, which includes the Milestones (an outline due in Module 3 and a draft due in Module 5) and the final Portfolio Project, which is due in Module 8.

In Module 3 you will complete the following:

### Module 3

#### **Portfolio Project Milestone: Identifying a Breach in a Virtualized Environment Outline (80 points)**

Identify a major breach of a virtualized environment that has occurred in the recent past (within the last five years). For your Portfolio Project Assignment, you will write a critical evaluation of your chosen breach, and review and analyze the breach along the following dimensions:

1. What went wrong?
2. Why did it occur?
3. Who was responsible?
4. How could it have been prevented?
5. What advice would you offer to prevent such a breach from occurring in the future?

For the purposes of this assignment, you will write the outline for the Portfolio Project.

Your outline should meet the following requirements:

- Be approximately 1-2 pages in length, not including the cover page and reference page.
- Follow the *CSU-Global Guide to Writing & APA*. Your outline should include an introduction, a body, and a conclusion.
- Cite a minimum of eight to 10 related sources—five of which should be academic peer-reviewed scholarly sources—to support your positions, claims, and observations, in addition to your textbook. The CSU-Global Library is a great place to find resources.
- Be clear and well-written, concise, and logical, using excellent grammar and style techniques. You are being graded in part on the quality of your writing. If you need assistance with your writing style, start with Tools for Effective Writing at the CSU-Global Library, accessible from the Library's homepage.

In Module 5 you will complete the following:

### Module 5

#### **Portfolio Project Milestone: Identify a Major Breach Draft (80 points)**

Identify a major breach of a virtualized environment that has occurred in the recent past (within the last five years). For your Portfolio Project Assignment, you will write a critical evaluation of your chosen breach, and review and analyze the breach along the following dimensions:

1. What went wrong?
2. Why did it occur?
3. Who was responsible?

4. How could it have been prevented?
5. What advice would you offer to prevent such a breach from occurring in the future?

For the purposes of this assignment, you will write the draft for the Portfolio Project.

Your outline should meet the following requirements:

- Be approximately 4-5 pages in length, not including the cover page and reference page. The Portfolio Project should be 10-12 pages in length and is due in Module 8.
- Follow the *CSU-Global Guide to Writing & APA*. Your outline should include an introduction, a body, and a conclusion.
- Cite a minimum of eight to 10 related sources—five of which should be academic peer-reviewed scholarly sources—to support your positions, claims, and observations, in addition to your textbook. The CSU-Global Library is a great place to find resources.
- Be clear and well-written, concise, and logical, using excellent grammar and style techniques. You are being graded in part on the quality of your writing. If you need assistance with your writing style, start with Tools for Effective Writing at the CSU-Global Library, accessible from the Library's homepage.

In Module 8 you will complete the following:

## Module 8

### Portfolio Project: Identify a Major Breach (190 points)

Identify a major breach of a virtualized environment that has occurred in the recent past (within the last five years). In a 10-12 page, critical evaluation of your chosen breach, review and analyze the breach along the following dimensions:

1. What went wrong?
2. Why did it occur?
3. Who was responsible?
4. How could it have been prevented?
5. What advice would you offer to prevent such a breach from occurring in the future?

Submit your Portfolio Project as a single document.

Your paper should meet the following requirements:

- 10-12 pages in length, not including the cover page and reference page.
- Follow the *CSU-Global Guide to Writing & APA*. Your paper should include an introduction, a body with fully developed content, and a conclusion.
- Support your answers with the readings from the course and at least four scholarly journal articles. The CSU-Global Library is a great place to find resources.
- Cite a minimum of eight to 10 related sources—five of which should be academic peer-reviewed scholarly sources—to support your positions, claims, and observations, in addition to your textbook.
- Be clear and well-written, concise, and logical, using excellent grammar and style techniques. You are being graded in part on the quality of your writing. If you need assistance with your writing style, start with Tools for Effective Writing at the CSU-Global Library, accessible from the Library's homepage.

## Module 2

### Critical Thinking: Data Security in Cloud Platforms (70 points)

Data security is a major issue in any cloud computing platform. What are some of the measures that can be taken to ensure that data in a cloud environment is secure? Based on your readings which platform is easier to configure, patch, and secure? Include some best practices for securing a hypervisor?

Your assignment should be clear and well-written, concise, and logical, using excellent grammar and style techniques. You are being graded in part on the quality of your writing. If you need assistance with your writing style, start with Tools for Effective Writing at the CSU-Global Library, accessible from the Library's homepage. You may also want to consider utilizing the Writing Center 24/7 tutoring. Please keep in mind that there are times where it can take 24-48 hours to receive a response, so plan ahead for your assignment.

The length and formatting requirements include:

- 3-4 pages in length, not including cover and reference pages. Written assignments must have a cover page, section headers, an introduction, a conclusion, and a reference page.
- Formatted according to the [CSU-Global Guide to Writing & APA](#).
- Cite a minimum of three sources—two of which should be academic peer-reviewed scholarly sources—to support your positions, claims, and observations, in addition to your textbook.

### Module 3

#### **Critical Thinking: Selecting a Cloud-Based Vendor in the U.S. (70 points)**

For this assignment, complete a summary that addresses the following scenarios based on your readings this week:

1. Many users do not yet feel comfortable storing data within the cloud. Discuss some steps you can take to reduce their concerns.
2. Assume that you must select a cloud-based data storage solution for your company. List the factors you would consider when selecting a U.S.-based vendor.

Your assignment should be clear and well-written, concise, and logical, using excellent grammar and style techniques. You are being graded in part on the quality of your writing. If you need assistance with your writing style, start with Tools for Effective Writing at the CSU-Global Library, accessible from the Library's homepage. You may also want to consider utilizing the Writing Center 24/7 tutoring. Please keep in mind that there are times where it can take 24-48 hours to receive a response, so plan ahead for your assignment.

The length and formatting requirements include:

- 3-4 pages in length, not including cover and reference pages. Written assignments must have a cover page, section headers, an introduction, a conclusion, and a reference page.
- Formatted according to the [CSU-Global Guide to Writing & APA](#).  
Cite a minimum of three sources—two of which should be academic peer-reviewed scholarly sources—to support your positions, claims, and observations, in addition to your textbook. The CSU-Global library is a great place to find these resources.

#### **Portfolio Project Milestone: Identifying a Major Breach in a Virtualized Environment Outline (80 points)**

Identify a major breach of a virtualized environment that has occurred in the recent past (within the last five years). For your Portfolio Project Assignment, you will write a critical evaluation of your chosen breach, and review and analyze the breach along the following dimensions:

1. What went wrong?

2. Why did it occur?
3. Who was responsible?
4. How could it have been prevented?
5. What advice would you offer to prevent such a breach from occurring in the future?

For the purpose of this assignment you will write the outline for the Portfolio Project.

Your outline should meet the following requirements:

- Be approximately 1-2 pages in length, not including the cover page and reference page.
- Follow the [CSU-Global Guide to Writing & APA](#). Your outline should include an introduction, a body, and a conclusion.
- Cite a minimum of eight to 10 related sources—five of which should be academic peer-reviewed scholarly sources—to support your positions, claims, and observations, in addition to your textbook. The [CSU-Global Library](#) is a great place to find resources.
- Be clear and well-written, concise, and logical, using excellent grammar and style techniques. You are being graded in part on the quality of your writing. If you need assistance with your writing style, start with [Tools for Effective Writing at the CSU-Global Library](#), accessible from the Library's homepage.

## Module 4

### **Critical Thinking: Microsoft Desktop Virtualization Tools (70 points)**

Assume that your company has 1,000 desktops, for which your CIO wants to deliver an operating system and environment on demand. Discuss which Microsoft desktop virtualization tools you would require and the corresponding cost.

Your assignment should be clear and well-written, concise, and logical, using excellent grammar and style techniques. You are being graded in part on the quality of your writing. If you need assistance with your writing style, start with [Tools for Effective Writing at the CSU-Global Library](#), accessible from the Library's homepage. You may also want to consider utilizing the Writing Center 24/7 tutoring. Please keep in mind that there are times where it can take 24-48 hours to receive a response, so plan ahead for your assignment.

The length and formatting requirements include:

- 3-4 pages in length, not including cover and reference pages. Written assignments must have a cover page, section headers, an introduction, a conclusion, and a reference page.
- Formatted according to the [CSU-Global Guide to Writing & APA](#).
- Cite a minimum of three sources—two of which should be academic peer-reviewed scholarly sources—to support your positions, claims, and observations, in addition to your textbook. The CSU-Global library is a great place to find these resources.

### **Portfolio Project Reminder**

Continue working on your draft and make sure that all APA citations are correct. Contact your instructor if you have any questions regarding the assignment and grading expectations or course content. You may also want to consider utilizing the Writing Center 24/7 tutoring. Please keep in mind that there are times where it can take 24-48 hours to receive a response, so plan ahead for your assignment.

## Module 5

### **Critical Thinking: Reducing the Risk of Failure of a Cloud-Migration Project (70 points)**

Discuss steps you would take to reduce the risk of failure of a cloud-migration project. In an essay, discuss the following questions based on course readings:

1. What is log management?
2. What steps would you take to integrate virtualization into existing workflows?

Your assignment should be clear and well-written, concise, and logical, using excellent grammar and style techniques. You are being graded in part on the quality of your writing. If you need assistance with your writing style, start with [Tools for Effective Writing at the CSU-Global Library](#), accessible from the Library's homepage. You may also want to consider utilizing the Writing Center 24/7 tutoring. Please keep in mind that there are times where it can take 24-48 hours to receive a response, so plan ahead for your assignment.

The length and formatting requirements include:

- 3-4 pages in length, not including cover and reference pages. Written assignments must have a cover page, section headers, an introduction, a conclusion, and a reference page.
- Formatted according to the [CSU-Global Guide to Writing & APA](#).

Cite a minimum of three sources—two of which should be academic peer-reviewed scholarly sources—to support your positions, claims, and observations, in addition to your textbook. The CSU-Global library is a great place to find these resources.

### **Portfolio Project: Identify a Major Breach Draft (80 points)**

Identify a major breach of a virtualized environment that has occurred in the recent past (within the last five years). For your Portfolio Project Assignment, you will write a critical evaluation of your chosen breach, and review and analyze the breach along the following dimensions:

1. What went wrong?
2. Why did it occur?
3. Who was responsible?
4. How could it have been prevented?
5. What advice would you offer to prevent such a breach from occurring in the future?

For the purposes of this assignment, you will write the draft for the Portfolio Project.

Your outline should meet the following requirements:

- Be approximately 4-5 pages in length, not including the cover page and reference page. The Portfolio Project should be 10-12 pages in length and is due in Module 8.
- Follow the [CSU-Global Guide to Writing & APA](#). Your outline should include an introduction, a body, and a conclusion.
- Cite a minimum of eight to 10 related sources—five of which should be academic peer-reviewed scholarly sources—to support your positions, claims, and observations, in addition to your textbook. The [CSU-Global Library](#) is a great place to find resources.
- Be clear and well-written, concise, and logical, using excellent grammar and style techniques. You are being graded in part on the quality of your writing. If you need assistance with your writing style, start with [Tools for Effective Writing at the CSU-Global Library](#), accessible from the Library's homepage.

## Module 6

### **Critical Thinking: Corporate Development in the Cloud (90 points)**

Virtualization plays a major role in disaster recovery and business continuity planning. Find a scholarly article related to DR/BCP and discuss virtualization's impact on possible solutions. Discuss the advantages and disadvantages of a virtual solution for DR/BCP.

Your assignment should be clear and well-written, concise, and logical, using excellent grammar and style techniques. You are being graded in part on the quality of your writing. If you need assistance with your writing style, start with Tools for Effective Writing at the CSU-Global Library, accessible from the Library's homepage. You may also want to consider utilizing the Writing Center 24/7 tutoring. Please keep in mind that there are times where it can take 24-48 hours to receive a response, so plan ahead for your assignment.

The length and formatting requirements include:

- 2-3 pages in length, not including cover and reference pages. Written assignments must have a cover page, section headers, an introduction, a conclusion, and a reference page.
- Formatted according to the [CSU-Global Guide to Writing & APA](#).
- Cite a minimum of three sources—two of which should be academic peer-reviewed scholarly sources—to support your positions, claims, and observations, in addition to your textbook. The CSU-Global library is a great place to find these resources.

### **Portfolio Project Reminder**

Review the feedback received from your instructor in Module 5 and contact your instructor if you have any questions. Begin incorporating your instructor's feedback into your draft. Your Portfolio Project is due in Module 8. You may also want to consider continuing to utilize the Writing Center 24/7 tutoring. Please keep in mind that there are times where it can take 24-48 hours to receive a response, so plan ahead for your assignment.

## Module 7

### **Portfolio Project Reminder**

By this time, you should finish revising your Portfolio Project, which is due in Module 8. Make sure that the APA formatting and citations are correct throughout your paper.

## Module 8

### **Portfolio Project: Identify a Major Breach (190 points)**

Identify a major breach of a virtualized environment that has occurred in the recent past (within the last five years). In a 10-12 page, critical evaluation of your chosen breach, review and analyze the breach along the following dimensions:

1. What went wrong?
2. Why did it occur?
3. Who was responsible?
4. How could it have been prevented?
5. What advice would you offer to prevent such a breach from occurring in the future?

Submit your Portfolio Project as a single document.

Your paper should meet the following requirements:

- Be 10-12 pages in length, not including the cover page and reference page.

- Follow the [CSU-Global Guide to Writing & APA](#). Your paper should include an introduction, a body with fully developed content, and a conclusion.
- Support your answers with the readings from the course and at least four scholarly journal articles. The [CSU-Global Library](#) is a great place to find resources.
- Cite a minimum of eight to 10 related sources—five of which should be academic peer-reviewed scholarly sources—to support your positions, claims, and observations, in addition to your textbook.
- Be clear and well-written, concise, and logical, using excellent grammar and style techniques. You are being graded in part on the quality of your writing. If you need assistance with your writing style, start with [Tools for Effective Writing at the CSU-Global Library](#), accessible from the Library’s homepage.

## Course Policies



### Course Grading

20% Discussion Participation  
 0% Opening Exercises  
 8% Mastery Exercises  
 37% Critical Thinking Assignments  
 35% Final Portfolio Project

### Grading Scale and Policies

A	95.0 – 100
A-	90.0 – 94.9
B+	86.7 – 89.9
B	83.3 – 86.6
B-	80.0 – 83.2
C+	75.0 – 79.9
C	70.0 – 74.9
D	60.0 – 69.9
F	59.9 or below

### In-Classroom Policies

For information on late work and incomplete grade policies, please refer to our [In-Classroom Student Policies and Guidelines](#) or the Academic Catalog for comprehensive documentation of CSU-Global institutional policies.

### Academic Integrity

Students must assume responsibility for maintaining honesty in all work submitted for credit and in any other work designated by the instructor of the course. Academic dishonesty includes cheating, fabrication, facilitating academic dishonesty, plagiarism, reusing/re-purposing your own work (see *CSU-Global Guide to Writing and APA Requirements* for percentage of repurposed work that can be used in an assignment), unauthorized possession of academic materials, and unauthorized collaboration. The CSU-Global Library provides information on how students can avoid plagiarism by understanding what it is and how to use the Library and Internet resources.

### Citing Sources with APA Style

All students are expected to follow the *CSU-Global Guide to Writing and APA Requirements* when citing in APA (based on the APA Style Manual, 6th edition) for all assignments. For details on CSU-Global APA style, please review the APA resources within the CSU-Global Library under the “APA Guide & Resources” link. A link to this document should also be provided within most assignment descriptions in your course.

### Disability Services Statement

CSU-Global is committed to providing reasonable accommodations for all persons with disabilities. Any student with a documented disability requesting academic accommodations should contact the Disability Resource Coordinator at 720-279-0650 and/or email [ada@CSUGlobal.edu](mailto:ada@CSUGlobal.edu) for additional information to coordinate reasonable accommodations for students with documented disabilities.

**Netiquette**

Respect the diversity of opinions among the instructor and classmates and engage with them in a courteous, respectful, and professional manner. All posts and classroom communication must be conducted in accordance with the student code of conduct. Think before you push the Send button. Did you say just what you meant? How will the person on the other end read the words?

Maintain an environment free of harassment, stalking, threats, abuse, insults or humiliation toward the instructor and classmates. This includes, but is not limited to, demeaning written or oral comments of an ethnic, religious, age, disability, sexist (or sexual orientation), or racist nature; and the unwanted sexual advances or intimidations by email, or on discussion boards and other postings within or connected to the online classroom.

If you have concerns about something that has been said, please let your instructor know.