



## ITS440 – Cloud Computing and Big Data

**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 10-25 hours per week in each course reading material, interacting on the discussion boards, writing papers, completing projects, and doing research.

### Course Description and Outcomes



#### Course Description:

The promise of cloud computing technology to provide unlimited utility computing and storage capacity to organizations is investigated. The various types of current cloud computing services offered by the major service vendors are studied. The challenges of managing “big data” are reviewed, and the relationships of cloud computing, big data, and data mining are examined. Students cannot receive credit for both ITS440 and MIS440. *Prerequisite: ITS410*

#### Course Overview:

In this course you will learn about two extremely important, and sometimes interrelated, emerging data management technologies: *cloud computing* and *big data*. You will analyze the reasons why cloud computing provides an attractive alternative to an on-site data center, and the technical and economic impacts of migrating to the cloud. You will also gain an appreciation of the challenges of managing vast quantities of structured and unstructured big data, and how organizations are trying to leverage big data stores via analytics for strategic decision-making. You will conduct research into current and proposed solutions for both of these information technologies.

#### Course Learning Outcomes:

1. Compare and contrast the advantages and challenges of cloud computing.
2. Describe the challenges involved with managing big data.
3. Describe and analyze the interrelationships between cloud computing and big data.
4. Describe the service types and deployment types of cloud computing.
5. Apply different virtualization techniques to provide resources for cloud computing solutions.
6. Identify and propose the best strategies and practices for managing cloud computing resources.
7. Examine and analyze some of the current vendor solutions offering cloud computing solutions for applications.

8. Analyze and select application development guidelines and technologies to best leverage cloud computing offerings.
9. Describe and appraise the potential security threats involved with cloud computing and propose how these can best be mitigated.
10. Predict the possible future impact of cloud computing applications and describe greater need for management of big data.

## 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



**Textbook Information is located in the CSU-Global Booklist on the Student Portal.**

## 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.
- Mastery Exercises: Students may access and retake mastery exercises through the last day of class until they achieve the scores they desire.
- Critical Thinking Activities: Assignments are due Sunday at 11:59 p.m. MT.

Wee k #	Readings	Assignments
1	<ul style="list-style-type: none"> <li>• Chapter 1 in <i>Cloud Computing</i></li> <li>• Garrison, G., Kim, S., &amp; Wakefield, R. L. (2012). Success factors for deploying cloud computing. <i>Communications of the ACM</i>, 55(9), 62-68. doi:10.1145/2330667.2330685</li> <li>• Mell, P., &amp; Grance, T. (2011, September). <i>Special publication</i></li> </ul>	<ul style="list-style-type: none"> <li>• Discussion (25 points)</li> <li>• Mastery (10 points)</li> <li>• Critical Thinking (70 points)</li> </ul>

	800-145: <i>The NIST definition of cloud computing; Recommendations of the National Institute of Standards and Technology</i> . Retrieved from <a href="http://csrc.nist.gov/publications/nistpubs/800-145/SP800-145.pdf">http://csrc.nist.gov/publications/nistpubs/800-145/SP800-145.pdf</a>	
2	<ul style="list-style-type: none"> <li>• Chapters 2, 3, 4, &amp; 5 in <i>Cloud Computing</i></li> <li>• BlueSnap. (2012, April 17). BlueSnap monetizes Zibaba Facebook social commerce and marketing platform. <i>Business Wire (English)</i>. Retrieved from <a href="http://www.businesswire.com/news/home/20120417005368/en/BlueSnap-Monetizes-Zibaba-Facebook-Social-Commerce-Marketing#.U5T5pSiVnrw">http://www.businesswire.com/news/home/20120417005368/en/BlueSnap-Monetizes-Zibaba-Facebook-Social-Commerce-Marketing#.U5T5pSiVnrw</a></li> <li>• PR, N. (2014, January 28). While many companies try SaaS for cost savings, top performers discover competitive advantage, according to IBM study. <i>PR Newswire US</i>. Retrieved from <a href="http://www-03.ibm.com/press/us/en/pressrelease/43035.wss">http://www-03.ibm.com/press/us/en/pressrelease/43035.wss</a></li> </ul>	<ul style="list-style-type: none"> <li>• Discussion (25 points)</li> <li>• Mastery (10 points)</li> <li>• Critical Thinking (75 points)</li> </ul>
3	<ul style="list-style-type: none"> <li>• Chapters 6 &amp; 7 in <i>Cloud Computing</i></li> <li>• Social media changing TV viewing habits. (2011). <i>Telecom Asia</i>, 22(9), 1.</li> <li>• Wilson, J. R. (2013). The challenge of a secure military cloud. <i>Military &amp; Aerospace Electronics</i>, 24(11), 20.</li> </ul>	<ul style="list-style-type: none"> <li>• Discussion (25 points)</li> <li>• Mastery (10 points)</li> <li>• Critical Thinking (75 points)</li> </ul>
4	<ul style="list-style-type: none"> <li>• Chapters 8 &amp; 9 in <i>Cloud Computing</i></li> </ul>	<ul style="list-style-type: none"> <li>• Discussion (25 points)</li> <li>• Mastery (10 points)</li> </ul>
5	<ul style="list-style-type: none"> <li>• Chapters 10, 11, &amp; 12 in <i>Cloud Computing</i></li> </ul>	<ul style="list-style-type: none"> <li>• Discussion (25 points)</li> <li>• Mastery (10 points)</li> <li>• Critical Thinking (75 points)</li> </ul>
6	<ul style="list-style-type: none"> <li>• Chapters 13, 14, 15, &amp; 16 in <i>Cloud Computing</i></li> </ul>	<ul style="list-style-type: none"> <li>• Discussion (25 points)</li> <li>• Mastery (10 points)</li> <li>• Critical Thinking (75 points)</li> </ul>
7	<ul style="list-style-type: none"> <li>• Chapters 17, 18, &amp; 19 in <i>Cloud Computing</i></li> </ul>	<ul style="list-style-type: none"> <li>• Discussion (25 points)</li> <li>• Mastery (10 points)</li> </ul>
8	<ul style="list-style-type: none"> <li>• Chapter 20 in <i>Cloud Computing</i></li> </ul>	<ul style="list-style-type: none"> <li>• Discussion (25 points)</li> <li>• Mastery (10 points)</li> <li>• Portfolio (350 points)</li> </ul>

## Assignment Details



This course includes the following assignments/projects:

### Module 1

Choose one of the following two assignments to complete this week. Do not do both assignments. Identify your assignment choice in the title of your submission. When you are ready to submit, click the Module 1 Critical Thinking header on the Assignments page to upload the document.

### **Assignment Choice #1: Advantages of Cloud Computing**

A school decides it wants to provide a common and consistent “office” solution (a software package that includes word processing, spreadsheets, presentation capabilities, and drawing capabilities) to all students and teachers in the school. The school has approximately 1,000 students, 50 teachers, five administrators, five secretaries, and 10 food/maintenance workers. The school also wants to provide a solution that allows students to do their homework on any device they own, with the ability to log in from anywhere anytime and get to the work they last worked on where they left off.

Right now the school has at least four different versions of office software, the library has PCs, the classrooms have Macs, some of the kids have tablets of varying varieties, and the office staff members all have different laptops. The IT group has a heck of a time ensuring all machines are up to date, patched correctly, and have the correct software installed. Everyone is provided a USB drive to save their work to.

You have been tasked with outlining a “cloud computing” strategy that will provide a common and consistent solution to the above scenario. Be sure your outline includes:

1. What cloud-based services or deployment models would you recommend? And why?
2. What common office software would you recommend? And why?
3. Does your solution ensure log-in capabilities from anywhere anytime on any platform? Be sure to address how.

Your proposal should be 2-3 pages in length and include at least three credible scholarly resources to support your findings. The CSU-Global Library is a good place to find these sources. Be sure to cite and reference your work using the *CSU-Global Guide to Writing and APA Requirements*.

### **Assignment Choice #2: Cloud-Based Organizations**

Your company is interested in learning more about cloud computing and the varying services offered. The head of the IT department has handed you a list of cloud-based organizations—he doesn’t have time to put together a report for the CEO that explains what cloud computing does and how it might benefit the organization. That, of course, is why YOU got the list.

For each of the organizations on the list, you are to report back on the following:

1. What is the organization’s primary cloud function—what advantages might the organization have over another organization that provides the same product or service?
2. What type of cloud computing service model is the organization using?
3. Does the organization provide any type of cloud deployment model? If so, what is it and why might your organization choose the company you are reporting about over another one?
4. What “promises” of a secure cloud environment does the organization highlight? Are those considerations important to your company? Why?

The list you were given contains the following organizations:

1. Apple iCloud

2. Amazon Web Services
3. Google Docs
4. Windows Azure
5. Salesforce.com

Your proposal should be 2-3 pages in length and include at least three credible scholarly resources to support your findings. The CSU-Global Library is a good place to find these sources. Be sure to cite and reference your work using the *CSU-Global Guide to Writing and APA Requirements*.

## Module 2

### CRITICAL THINKING ASSIGNMENT (75 points)

Choose one of the following two assignments to complete this week. Do not do both assignments. Identify your assignment choice in the title of your submission. When you are ready to submit, click the Module 2 Critical Thinking header on the Assignments page to upload the document.

#### Assignment Choice #1: Facebook as a SaaS Solution?

There are a lot of varied opinions among experts as to whether Facebook is a SaaS social media site. Justify your position on whether or not Facebook is a SaaS cloud computing solution. Analyze the SaaS characteristics and argue whether or not you believe it is. Include a description of the most appropriate deployment model for a social media site such as Facebook.

Your paper should be 2-3 pages in length and conform to the *CSU-Global Guide to Writing and APA Requirements*. Cite and reference at least two credible outside sources in addition to the textbook. The CSU-Global Library is a good place to find these references.

#### Assignment Choice #2: IDaaS Service Model Presentation

You have recently started working for a new company and like it pretty well so far. There is one thing that is driving you a bit crazy, though. The company has to create a different login for you for every single application you need to use. You have different user IDs and passwords for the accounting system, the order inventory system, the customer tracking system, and your email. You approach your boss and suggest the company adopt an IDaaS service model. Your boss says “sounds like a good idea; why don’t you put together a presentation and sell it to the CTO?”

Your presentation must be at least 6-10 slides in length. Each slide must have accompanying speaker notes. As part of your presentation, be sure to touch upon the 4 A’s of cloud identity (authentication, authorization, account management, and audit logging.) Also, be sure to explain both the advantages and disadvantages of SSO. Make a viable argument and support your analysis with at least two credible sources in addition to the course textbook in your research. The CSU-Global Library is a good place to find these resources. Presentations also require proper citations and references, so follow the *CSU-Global Guide to Writing and APA Requirements* and include a references slide at the end of your presentation.

## Module 3

### CRITICAL THINKING ASSIGNMENT (75 points)

Choose one of the following two assignments to complete this week. Do not do both assignments. Identify your assignment choice in the title of your submission. When you are ready to submit, click the Module 3 Critical Thinking header on the Assignments page to upload the document.

#### **Assignment Choice #1: Streaming Video from the Cloud**

Discuss how the ability of companies to stream movies and TV programs on demand to our homes is changing our viewing habits. Contrast the offerings of providers such as Hulu and Netflix.

Your paper should be 2-3 pages in length and conform to the *CSU-Global Guide to Writing and APA Requirements*. Include at least two scholarly references in addition to the course textbook. The CSU-Global Library is a good place to find these references.

#### **Assignment Choice #2: Working in the Cloud Presentation**

You have recently been hired by a company that is planning to increase its remote workforce by 200% starting in six months. In that period of time, you need to propose a solution that would allow the remote employees the ability to do the following:

Meet collaboratively, which includes:

- white board sharing
- application sharing
- video/voice sharing
- chat
- document collaboration

As part of the presentation, you have been tasked with including these requirements:

- Define and describe collaboration and how it works in the cloud.
- List the benefits of cloud-based collaboration.
- List and describe cloud-based tools for document sharing.

The last part of your presentation needs to include a Frequently Asked Questions section that has questions and answers that one might consider with respect to cloud-based collaboration tools.

The presentation should be between 8-12 slides in length, with detailed speaker's notes. It must also include a references page with at least two scholarly outside sources besides the textbook. The CSU-Global Library is a good place to find resources. The presentation should conform to *the CSU-Global Guide to Writing and APA Requirements*.

## **Module 5**

### **CRITICAL THINKING ASSIGNMENT (75 points)**

Choose one of the following two assignments to complete this week. Do not do both assignments. Identify your assignment choice in the title of your submission. When you are ready to submit, click the Module 5 Critical Thinking header on the Assignments page to upload the document.

#### **Assignment Choice #1: Utilizing a Web Service**

Describe how an application at your organization could make use of a specific Web service and the development tasks that would be involved.

Your paper should be 2-3 pages in length and conform to the *CSU-Global Guide to Writing and APA Requirements*. Include at least two scholarly references in addition to the course textbook. The CSU-Global Library is a good place to find these references.

### **Assignment Choice #2: Cloud Based Disaster Recovery Plan**

The company you work for does NOT have a disaster recovery plan in place. Your boss has just asked you to put together a presentation that would outline the steps necessary to create such a plan.

Your job is to not only “sell” the idea but provide details regarding the varying threats to the IT data center infrastructure of your company and recommending cloud-based solutions to mitigate those risks. In your presentation, be sure to include definitions of what both business continuity and disaster recovery mean and why they are important to an enterprise. Be sure to also discuss recommendations for including cloud-based backup operations “just in case.”

Be sure to include speaker’s notes with each slide. Your slide deck should be between 6-10 slides in length and conform to the *CSU-Global Guide to Writing and APA Requirements*. Include at least two scholarly references in addition to the course textbook. The CSU-Global Library is a good place to find these references.

## **Module 6**

### **CRITICAL THINKING ASSIGNMENT (75 points)**

Choose one of the following two assignments to complete this week. Do not do both assignments. Identify your assignment choice in the title of your submission. When you are ready to submit, click the Module 5 Critical Thinking header on the Assignments page to upload the document.

#### **Assignment Choice #1: Evaluating Return on Investment (ROI)**

Describe how a company can effectively evaluate its return on investment (ROI) when deciding to make use of cloud computing resources.

Your paper should be 2-3 pages in length and conform to the *CSU-Global Guide to Writing and APA Requirements*. Include at least two scholarly references in addition to the course textbook. The CSU-Global Library is a good place to find these references.

#### **Assignment Choice #2: Migrating an Application to the Cloud**

Your company has decided to move your email system to the cloud. Your company now uses a full-blown version of Microsoft Exchange. The company has had issues with mailboxes too full and people unable to send/receive emails. The backup system doesn’t function properly, and the calendaring component for some reason no longer functions correctly. You are responsible for putting together a detailed requirements-specification report for the IT group.

Your specifications report should include the following:

- Requirements for migrating an application to the cloud
- The plan for backing up data before and after moving an application to the cloud
- A description of an application in terms of its resource use
- Recommendations for training employees before, during, and after a cloud migration
- Recommendations for establishing a realistic cloud-deployment schedule
- A discussion of potential IT governance issues related to the email migration to the cloud

Your report should be 2-3 pages in length and conform to the *CSU-Global Guide to Writing and APA Requirements*. Include at least two scholarly references in addition to the course textbook. The CSU-Global Library is a good place to find these references.

## Module 8

### PORTFOLIO PROJECT (350 points)

You have a choice between two Portfolio Projects. Do not do both projects. Identify your Portfolio Project choice in the title of your document. When you are ready to submit, click the Module 8 Portfolio Project assignment header on the Assignments page to upload your Portfolio Project.

#### Portfolio Project Assignment Choice #1: Cloud Computing Strategy

You are the IT director for XYZ Manufacturing. Your company is a B2B (business-to-business) organization that supplies auto parts to General Motors. There are 200 employees at XYZ Manufacturing with a headquarters in Detroit, Michigan, and field offices in Omaha, Nebraska; Austin, Texas; and Orlando, Florida. There are over 10,000 items in the inventory for XYZ Manufacturing and you receive raw material (i.e. steel, plastic, wiring, etc.) from China.

XYZ Manufacturing has been struggling for years with inadequate computer resources to track inventory and handle user requests from internal management, orders and invoices from General Motors, orders and invoices from your suppliers, and management reports. There is clearly an inability to store and retrieve complex “big data,” and recently there have been frequent security breaches. Your CIO is extremely frustrated with this situation and is looking for an alternative approach to providing IT services. She has asked you for input on this investigation.

Write a paper that describes the advantages and disadvantages that cloud computing offers to your organization. Include a sensible, detailed strategy to migrate to cloud computing, addressing the issues of performance, scalability, and economic factors.

Your paper should be 8-10 pages in length and conform to the *CSU-Global Guide to Writing and APA Requirements*. Include at least five credible references in addition to the course textbook. The CSU-Global Library is a good place to find these references.

#### Portfolio Project Assignment Choice #2: Big Data and Cloud Solutions

After completing this course, you have learned a great deal about the cloud and how it works. The cloud and big data go hand in hand. According to Chong (2014),

A recent study indicates that unstructured data account for at least 80% of the world's data. This means that many companies today are making mission critical decisions with only 20% of the data they have, the 20% of data that is structured and stored in relational databases ... Now it is



possible to manage this vast amount of data, structured and unstructured. When we talk about big data, we not only refer to existing data that have been collected for years. We also talk about huge amounts of data being generated because of social media, mobile devices, sensors, and other technologies. (para. 5)

IBM offers one solution—Hadoop and the IBM SmartCloud Enterprise. There are other solutions provided by multiple other vendors out there as well.

For this project you will be researching at least four different big-data/cloud solutions. You may use Hadoop as one if you wish.

The paper should begin with an introduction to what big data is and its relationship to cloud computing.

The second section of the paper should define the following terms:

- Big data storage
- Application hosting
- Big data analytics
- Machine learning
- Streaming processing
- Data import
- Data sources

The third section of the paper should outline the four big-data/cloud computing solutions you will be comparing and contrasting, including justification as to why you chose those four. The final section of your paper should include a detailed matrix (explanations and details for each aspect) of the four solutions you are comparing. Use the following template:

Category	Product 1 name	Product 2 name	Product 3 name	Product 4 name
Big data storage				
Application hosting				
Big data analytics				
Machine learning				
Streaming processing				
Data import				
Data sources				

Finally, end your paper with a conclusion recommending the solution you think is the best.

Your paper should be 8-10 pages in length and conform to the *CSU-Global Guide to Writing and APA Requirements*. Include at least five credible references in addition to the course textbook. The CSU-Global Library is a good place to find these references.

## Course Grading



20% Discussion Participation  
10% Mastery Exercises  
35% Critical Thinking Activities  
35% Final Portfolio Paper

**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 on your course’s Assignments page.

### 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](tel: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.