



COMP4331 – Cloud Computing Spring 2017

Course Syllabus

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Introduction to the Course

About the Instructor

Instructor Name: Ibrahim H. Suslu

Office# 806

Virtual Office Hours: Monday & Wednesday: 3:00pm ~ 5:00pm

Tuesday: 9:00am ~ 11:00am

Other times by appointment

Email: ihesuslu@na.edu

URL: <http://cs.na.edu/~ihesuslu>

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Prerequisites/ Corequisites

There are no prerequisites for this course. In addition, it is assumed that students have basic computer networking knowledge.

Statement on Course Materials

Some of the writings, lectures, films, or presentations in this course may include material that conflicts with the core beliefs of some students. Please review the syllabus carefully to see if the course is one that you are committed to taking. If you have a concern, please discuss it with the instructor at your earliest convenience.

Course Description

This course is a tour through various topics and technologies related to Cloud Computing. Topics include distributed system models and enabling technologies, computer clusters for scalable Computing, virtual machines and virtualization of clusters and datacenters, design of cloud computing platforms, cloud programming and software environments, grid computing and resource management, P2P computing with overlay networks, ubiquitous computing with clouds and the Internet of things, and data-intensive distributed computing.

Instructional Contact Hours/Credits

Lecture - 45 Clock Hours / 3 Semester Credits

Virtual Office Hours

This is an online course. Instructor can be contacted via email and phone calls. Your emails will be answered within 24 hours. Phone calls will be accepted during office hours, and other times by appointment.

Please post your questions of general interest in the **Course Q and A forum**. Even if you don't have any questions of your own right now, check to see what may have been posted by others. If you know the answer to a question, feel free to post a reply. The instructor will be moderating and responding to the questions regularly. Please use email for private correspondence.



Course Materials

Textbook

1. Cloud Computing, Kris Jamsa, 2013, Johns & Bartlett Learning, ISBN: 978-1-4496-4739-1
2. Cloud Computing Networking, Lee Chao, 2016, CRC Press, ISBN: 978-1-4822-5481-5



Software and supplementary documents

- Windows Azure Cloud

Articles / e-Journals

- TBD

Library Resources

Since this course includes course activities that require students to gather information using library resources, students are expected to know how to use the library's resources including the available databases, periodicals, and journals. If you are not familiar with using the library, please visit the library's website for more detailed information:

<http://www.na.edu/library>

Technical Requirements

To access this course, students will need access to the Internet and a supported Web browser (Internet Explorer, Firefox, Safari or Chrome). For detailed hardware and software requirements, please visit the following website:

<http://www.na.edu/nau-distance-education/>

Course Technologies

This course requires a webcam and a built-in microphone to attend web conferences. This course requires assignments to be submitted in Microsoft Office or Adobe Acrobat (pdf) file formats. Assignments created using other applications, such as Google Documents, Microsoft Works or WordPerfect, are not acceptable.



Additional Software

Students will be required to complete work and assignments in Microsoft Office.

Course Format

This is a fully online course. In order to complete this course successfully students need access to a computer and the Internet on a daily basis. This course is both synchronous, (through webinars) and asynchronous (discussion board, group work, etc.) All instructions are contained in this syllabus and in the NAUmoodle course management system.

This course will be delivered entirely online through NAU Moodle course management system at Office 365 Portal named NAU Moodle. Students can get access through [Office 365 portal](#) with their NAU accounts provided by IT department. For login issues and account problems with NAU Moodle, please contact with Distance Education Support via one of the following methods:

- Visit Room 732
- Call 832-464-8691
- Email moodle@na.edu
- Visit <http://www.na.edu/nau-distance-education/>

For hardware and software problems other than NAUmoodle system, please contact with IT Department via one of the following methods:

- Visit Room 820
- Call 832-230-5541
- Email support@na.edu

Learning Outcomes

Program-Level Outcomes (PLO)

Program Name-Program Learning Outcomes (PLO)	Assessment
1. Demonstrate advanced skills of computing theory and algorithms.	
2. Develop sophisticated knowledge of operating systems and hardware.	
3. Apply advanced practices of software design and development cycle.	
4. Analyze data using advanced computing tools.	



5. Develop state-of-the-art skills of computer networks.	U
6. Engage and apply secure practices in various digital environments.	
Key: I=Introduced; E=Emphasized; U=Utilized; A=Comprehensive Assessment	

Course-Level Outcomes

Course-Level Outcomes (CLO)	Meets PLO
1. Understand Cloud Computing	5
2. Identify different cloud storage concepts	5
3. Give examples of underlying distributed file systems	5
4. Outline the concepts of alternative programming models	5
5. Produce applications that run-on cloud services	5

Grading

Grading Table

The following table summarizes the requirements and grading of the assignments in this course. The specific instructions for each activity are included in the appropriate forum, assignment, or quiz on the course NAU Moodle website.

Assignment	Quantity	Unit	Maximum Total
Discussion Forum	10	2	20
Bi-Weekly Assignments	7	4	28
Webinar Participation	7	1	7
Quizzes	10	2	20
Project	2	25	25
Course Total:			100



Grade Distribution

Point (or Percentage Achieved)	Course Grade
96~100	A
91~95	A-
86~90	B+
81~85	B
76~80	B-
71~75	C+
66~70	C
61~65	C-
56~60	D+
50~55	D
Below 50	F

Time Requirements:

The activities in this course are based on a 15-week instruction schedule. Course topics will be demonstrated and discussed online; however, additional time outside of class is required to achieve learning objectives. Students are expected to spend approximately 6 hours a week, on average, completing class activities such as assignments and projects. This meets the Federal Government's expectation of 2 hours of homework for each hour of lecture. The average time commitment range calculation for this course (3 Semester Credit Hour) is shown in the following table:

Class Activities	Weekly Minimum Expected Average Time
Discussion Forum Postings	0.5 hour
Assignments	6 hours
Webinar Participation	0.5 hour
Multimedia Presentations	0.5 hour
Readings	2 hours
Case Study	0.5 hour
Weekly Total:	10 hours



Total Term Expectation:

10 x 15 = 150 clock-hours

Late Submissions

Technology issues cannot be used as a reason for late assignments. You must have back-up plans for technology issues, such as technical problems with your computer, Internet server provider problems, etc.

Late work will be accepted for full earned credit if and only if arrangements are made with the instructor prior to time due. The instructor will only accept a late submission if you contact him/her in advance.

Assignment Guidelines

Discussion Forums

Students should participate in discussion forums and complete discussion activities with correct English usage, accurate spelling, and standard grammar. Students are expected to post a response to the discussion questions early in the week and maintain a thread of discussions throughout the week as they respond to their classmates.

Points will be given for:

- Following the timeline and quantity of posts to discussion questions
- Offering ideas or resources and inviting a review of them based on readings
- Articulating, explaining and supporting positions on ideas
- Exploring and supporting issues by adding explanations and examples
- Reflecting on and re-evaluating personal opinions based on readings
- Offering a review, challenging, discussing and expanding ideas of others
- Negotiating interpretations, definitions, and meanings
- Responding to at least two other students' responses

Students' work on discussion forum will be graded on two parts:

Criterion	Score %0	Score %50	Score %75	Score %100
Discussion Posting	Did not participate in discussion	Poorly developed, does not add to the discussion	Developing ideas	Well-developed ideas
Discussion responses to other students	Did not interact with any students	Interacts once with other students	Interacts twice with other students	Interacts at least three times with other students

Part I: The first part of this assignment requires students to post a response to the



instructor's discussion question. To secure credit, the response should be thoughtful; that is, it must refer to the weekly readings and information from other pertaining resources. Post your Part I response in the appropriate forum **by 11:55 p.m. Wednesday.**

Part II: The second part of this assignment requires students to respond to two other students' responses. Responses should be thoughtful and should go beyond simple "I agree" posts. They need to expand the idea presented and contribute to the discussion. Post your Part II responses in the appropriate forum **by 11:55 p.m. Sunday.**

Bi-Weekly Assignments

The purpose of this assignment is to encourage students to read, comprehend, and analyze the course materials. Students are expected to respond to the weekly prompt(s) provided by the instructor.

Rubric for the Bi-Weekly Assignments:

Criterion	Score %0	Score %50	Score %100
Depth and Breadth	Writing is so vague and ambiguous that no clear argument emerges.	Some original thinking is evident, though it may not be at the depth or extent seen in "A" work.	Information is presented accurately, in depth and demonstrates original thinking
Organization	No organization is evident.	Writing is generally clear and consistent.	The writing is clear, logical, and internally consistent.
Use of Sources	Information presented is sloppy or no use of sources.	Cites some of the resources provided	Cites all resources provided

Library Research Assignment

Main purpose of the library research assignments is to develop our students' library research skills, their academic writing skills, and to help our students gain confidence and facility in using library research tools. 4 out of 7 assignments will be library research assignment.

Our library website: <http://www.na.edu/library>



Webinars

The instructor will be conducting 60 minutes webinar sessions every other week. The webinars will include lecturing, reviewing course requirements, and answering any questions students may have. **Participation is optional but will be graded.** To get the full credit from the webinars:

1. Join the webinar, and type in your full name into chat box , **OR**
2. Watch the recorded webinar session on the Moodle page

Watch the recorded session on the course page and submit a brief summary of the webinar, a synopsis, in 100-150 words

The first webinar will be on 01/21/16, at 1:00 pm.

Webinar Schedule:

Webinar links will be posted on course website. Make sure that you installed [Gotomeeting](#) software/app to participate in the webinar sessions. Please refer to our technical support website to get more technical information: <http://www.na.edu/nau-distance-education/video-tutorials/>

Webinar	Date	Time
Session 1	TBD	TBD
Session 2	TBD	TBD
Session 3	TBD	TBD
Session 4	TBD	TBD
Session 5	TBD	TBD
Session 6	TBD	TBD
Session 7	TBD	TBD

Project

Students are required to complete two projects. Details will be provided during the semester

Quizzes

There will be 10 quizzes during the semester. You will need to take quizzes using NAU Moodle.

Students Rights and Responsibilities



Students are responsible for:

- reading any assigned reading as stated in the weekly blocks of the course page
- reviewing the web-page resources posted in the NAUmoodle course site for each week
- reading all discussion postings in the weekly blocks as assigned
- posting weekly discussion postings as assigned
- assuring that their computer/device is compatible and working to engage effectively in this online course
- uploading assignments before or on the assigned due date/time

Students can expect:

- the instructor will return email and phone communications within 24 hours unless otherwise announced in the course page.
- discussion participation will be responded to/graded after 5 days of the due date
- assignments will be graded after 7 days of the due date

Academic Honesty

Each student assumes the responsibilities of being a member of the NAU academic community. All acts of plagiarism are not tolerated including: cheating, claiming one's work as their own, fabrication and helping one to commit any of these acts. Any violations of academic honesty will receive strict disciplinary action, which can include suspension and even expulsion from NAU.

ADA Statement

When possible, and in accordance with 504/ADA guidelines, we will attempt to provide reasonable academic accommodations to students who request and require them. Please call North American University at (832) 230-5555 for more assistance.

Course Schedule

Week of	Topic, Learning Activities, Assignments, and Due Dates	Course Level Outcomes
First Day Jan 17 ~ Jan 22	<ul style="list-style-type: none">○ Introduce yourself to your classmates and to the instructor by participating in the Introduce Yourself discussion forum.○ Overview of the Course	



	<ul style="list-style-type: none">○ Review of Syllabus○ Review Course NAUMoodle site○ Course Procedure○ Discussion 1: Introduce yourself to your classmates	
Jan 23 ~ Jan 29	<ul style="list-style-type: none">○ Cloud Computing: Ch1 - Introducing Cloud Computing<ul style="list-style-type: none">- Cloud Computing: Ch1 presentation will be posted- Read Cloud Computing: Ch1- Introducing Cloud Computing○ Cloud Computing: Ch2 – Software as a Service (SaaS)<ul style="list-style-type: none">- Cloud Computing: Ch2 presentation will be posted- Read Cloud Computing: Ch2 Software as a Service (SaaS)○ Webinar 1 link will be published on NAUMoodle	1
Jan 30 ~ Feb 5	<ul style="list-style-type: none">○ Cloud Computing: Ch3 – Platform as a Service (PaaS)<ul style="list-style-type: none">- Cloud Computing: Ch3 presentation will be posted- Read Cloud Computing: Ch3 - Platform as a Service (PaaS)○ Cloud Computing: Ch4 – Infrastructure as a Service (IaaS)<ul style="list-style-type: none">- Cloud Computing: Ch4 presentation will be posted- Read Cloud Computing: Ch4 - Infrastructure as a Service (IaaS)○ Synopsis 1 needs to be submitted (Due on Feb 1 at 11:00 pm)○ Qz1 link will be published on NAUMoodle, (Due on Feb 1 at 11:00 pm)○ HW1 will be published on NAUMoodle○ Discussion 2 will be published on NAUMoodle	
Feb 6 ~ Feb 12	<ul style="list-style-type: none">○ Cloud Computing: Ch5 – Identity as a Service (IDaaS)<ul style="list-style-type: none">- Cloud Computing: Ch5 presentation will be posted- Read Cloud Computing: Ch5 - Identity as a Service (IDaaS)○ Cloud Networking: Ch1 – Overview on Cloud and Networking<ul style="list-style-type: none">- Cloud Networking Ch1 Presentation will be posted- Read Cloud Networking Ch1 - Overview on Cloud and Networking○ Qz2 link will be published and Due on Feb 18 at 11:00 pm.○ Discussion 3 will be published on NAUMoodle○ Webinar 2 link will be published on NAUMoodle○ HW1 is due on Feb 8 at 11:00 pm○ Discussion 2 is due on Feb 8 at 11:00 pm	1, 3, 5
Feb 13 ~ Feb 19	<ul style="list-style-type: none">○ Cloud Computing: Ch6 – Data Storage in the Cloud<ul style="list-style-type: none">- Cloud Computing: Ch6 presentation will be posted- Read Cloud Computing: Ch6 - Data Storage in the Cloud○ Cloud Networking: Ch2 – Network Protocols<ul style="list-style-type: none">- Cloud Networking Ch2 Presentation will be posted- Read Cloud Networking Ch2 - Network Protocols○ Synopsis 2 needs to be submitted (Due on Feb 15 at 11:00 pm)○ Discussion 3 is due on Feb 15 at 11:00 pm○ HW2 will be published on NAUMoodle (Article)	1, 2, 3, 5
Feb 20 ~ Feb 26	<ul style="list-style-type: none">○ Cloud Computing: Ch7 – Collaboration in the Cloud<ul style="list-style-type: none">- Cloud Computing: Ch7 presentation will be posted- Read Cloud Computing: Ch7 - Collaboration in the Cloud○ Cloud Networking: Ch3 – Network Concepts and Design<ul style="list-style-type: none">- Cloud Networking Ch3 Presentation will be posted- Read Cloud Networking Ch3 - Network Concepts and Design	1, 5



	<ul style="list-style-type: none"> ○ Qz3 link will be published and due on Feb 22 at 11:00 pm. ○ Webinar 3 link will be published on NAUMoodle ○ HW2 is due on Feb 22 at 11:00 pm ○ Discussion 4 will be published on NAUMoodle 	
Feb 27 ~ Mar 5 Week 7	<ul style="list-style-type: none"> ○ Cloud Computing: Ch8 – Virtualization <ul style="list-style-type: none"> - Cloud Computing: Ch8 presentation will be posted - Read Cloud Computing: Ch8 - Virtualization ○ Cloud Networking: Ch4 – Network Directory Services <ul style="list-style-type: none"> - Cloud Networking Ch4 Presentation will be posted - Read Cloud Networking Ch4 - Network Directory Services ○ Synopsis 3 needs to be submitted (Due on Feb 29 at 11:00 pm) ○ Discussion 4 is due on Feb 29 at 11:00 pm ○ HW3 will be published on NAUMoodle 	1, 2, 3, 5
Mar 6 ~ Mar 12	<ul style="list-style-type: none"> ○ Cloud Computing: Ch9 – Securing the Cloud <ul style="list-style-type: none"> - Cloud Computing: Ch9 presentation will be posted - Read Cloud Computing: Ch9 - Securing the Cloud ○ Cloud Networking: Ch5 – Dynamic Host Service and Name Service <ul style="list-style-type: none"> - Cloud Networking Ch5 Presentation will be posted - Read Cloud Networking Ch5 - Dynamic Host Service and Name Service ○ Provide Course Feedback: You will receive the survey link via email ○ Webinar 4 link will be published on NAUMoodle ○ HW3 is due on Mar 7 at 11:00 pm ○ HW4 will be published on NAUMoodle (Article) ○ Discussion 5 will be published on NAUMoodle ○ Qz4 link will be published and due on Mar 7 at 11:00 pm. 	1, 5
Mar 13 ~ Mar 19	Spring Break	
Mar 20 ~ Mar 26	<ul style="list-style-type: none"> ○ Cloud Computing: Ch10 – Disaster Recovery and Business Continuity and the Cloud <ul style="list-style-type: none"> - Cloud Computing: Ch10 presentation will be posted - Read Cloud Computing: Ch10 - Disaster Recovery and Business Continuity and the Cloud ○ Cloud Networking: Ch6 – Networking with Windows PowerShell <ul style="list-style-type: none"> - Cloud Networking Ch6 Presentation will be posted - Read Cloud Networking Ch6 - Networking with Windows PowerShell ○ Synopsis 4 needs to be submitted (Due on Mar 14 at 11:00 pm) ○ HW4 is due on Mar 14 at 11:00 pm ○ Discussion 5 is due on Mar 14 at 11:00 pm ○ Qz5 link will be published and due on Mar 14 at 11:00 pm. ○ Discussion 6 will be published on NAUMoodle 	1, 3, 4, 5
Mar 27 ~ Apr 2	<ul style="list-style-type: none"> ○ Cloud Computing: Ch11 – Service-Oriented Architecture <ul style="list-style-type: none"> - Cloud Computing: Ch11 presentation will be posted 	1, 4, 5



	<ul style="list-style-type: none">- Read Cloud Computing: Ch11 - Service-Oriented Architectureo Cloud Networking: Ch7 – Internet Data Transaction Protection<ul style="list-style-type: none">- Cloud Networking Ch7 Presentation will be posted- Read Cloud Networking Ch7 - Internet Data Transaction Protectiono Webinar 5 link will be published on NAUMoodleo HW5 will be published on NAUMoodleo Qz6 link will be published due on Mar 28 at 11:00 pm.o Discussion 6 is due on Mar 28 at 11:00 pm	
Apr 3 ~ Apr 9	<ul style="list-style-type: none">o Cloud Computing: Ch12 – Managing the Cloud<ul style="list-style-type: none">- Cloud Computing: Ch12 presentation will be posted- Read Cloud Computing: Ch12 - Managing the Cloudo Cloud Networking: Ch8 – Internet Protocol Security<ul style="list-style-type: none">- Cloud Networking Ch8 Presentation will be posted- Read Cloud Networking Ch8 - Internet Protocol Securityo Synopsis 5 needs to be submitted (Due on Apr 4 at 11:00 pm)o HW5 is due on Apr 4 at 11:00 pmo HW6 will be published on NAUMoodle (Article)o Qz7 link will be published due on Apr 4 at 11:00 pm.o Discussion 7 will be published on NAUMoodle	1, 5
Apr 10 ~ Apr 16	<ul style="list-style-type: none">o Cloud Computing: Ch17 – Design Cloud Based Solutions<ul style="list-style-type: none">- Cloud Computing: Ch17 presentation will be posted- Read Cloud Computing: Ch17 - Design Cloud Based Solutionso Cloud Networking: Ch9 – Routing and Remote Access Service<ul style="list-style-type: none">- Cloud Networking Ch9 Presentation will be posted- Read Cloud Networking Ch9 - Routing and Remote Access Serviceo Webinar 6 link will be published on NAUMoodleo Qz8 link will be published on due on Apr 11 at 11:00 pm.o Discussion 7 is due on Apr 11 at 11:00 pmo Discussion 8 will be published on NAUMoodle	1, 5
Apr 17 ~ Apr 23	<ul style="list-style-type: none">o Cloud Computing: Ch18 – Coding Cloud-Based Applications<ul style="list-style-type: none">- Cloud Computing: Ch18 presentation will be posted- Read Cloud Computing: Ch18 - Coding Cloud-Based Applicationso Cloud Networking: Ch10 – Virtual Private Network<ul style="list-style-type: none">- Cloud Networking Ch10 Presentation will be posted- Read Cloud Networking Ch10 - Virtual Private Networko Synopsis 6 needs to be submitted (Due on Apr 18 at 11:00 pm)o HW6 is due on Apr 18 at 11:00 pmo HW7 will be published on NAUMoodle (Article)o Qz9 link will be published due on Apr 18 at 11:00 pm.o Discussion 8 is due on Apr 18 at 11:00 pmo Discussion 9 will be published on NAUMoodle	1, 4, 5
Apr 24 ~ Apr 30	<ul style="list-style-type: none">o Cloud Computing: Ch19 – Application Scalability<ul style="list-style-type: none">- Cloud Computing: Ch19 presentation will be posted- Read Cloud Computing: Ch19 - Application Scalability	



	<ul style="list-style-type: none">○ Cloud Networking: Ch11 – Hybrid Cloud<ul style="list-style-type: none">- Cloud Networking Ch11 Presentation will be posted- Read Cloud Networking Ch11 - Hybrid Cloud○ Webinar 7 link will be published on NAUMoodle○ Qz10 link will be published due on Apr 25 at 11:00 pm.○ Discussion 9 is due on Apr 24 at 11:00 pm○ Discussion 10 will be published on NAUMoodle	
Mar 1 ~ Mar 3	<ul style="list-style-type: none">○ Cloud Computing: Ch20 – The Future of the Cloud<ul style="list-style-type: none">- Cloud Computing: Ch20 presentation will be posted- Read Cloud Computing: Ch20 - The Future of the Cloud○ Final Project due on TBD○ Complete Online Course Evaluation Survey: You will receive the survey link via email.○ Synopsis 7 needs to be submitted (Due on Mar 2 at 11:00 pm)○ HW7 is due on Mar 2 at 11:00 pm○ Discussion 10 is due on Apr Mar 2 at 11:00 pm	1

Syllabus subject to change

This syllabus may change as needed to support the student learning outcomes for this course.