Cloud Computing

Do less and achive more

CS516

Unubold Tumenbayar, M.S.

Maharishi International University is an Equal Opportunity Institution.

Course Overview

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
The theme I: IaaS - The Nature of Life is to Grow – Life is structured in layers						
Week 1	Cloud Computing Introduction	Virtual Machine (EC2 & IAM)	Object Storage (S3)	Load Balancers (ALB & NLB)	Auto Scaling (ASG)	Workshop
Theme II: Other important public services - Purification Leads to Progress						
Week 2	Relational Database (RDS)	App Integration (SQS & SNS)	Midterm Review	Midterm Exam	Serverless (Lambda)	Workshop
Theme III: FaaS – Cloud Native Applications						
Week 3	NoSQL Database (DynamoDB)	API Gateway & Cognito	Workshop	CloudFormation & CDK	Project	Project
Theme IV: Integrating all parts together - The Whole is Greater than the Sum of the Parts						
Week 4	Project	Project	Final Exam	Project Presentation & Grading		

Course Goal

This course provides a systematic introduction to cloud computing and how to build modern distributed systems that are scalable, resilient, efficient, and fault-tolerant.

Course objectives

This course will cover a comprehensive understanding of cloud services and technologies. Students will gain the ability to develop secure and robust solutions in the cloud and understand how well-architected distributed systems are built in detail.

Students will practice and work on various web services including virtual machines, load balancers, auto-scaling, object storage, databases, messaging, and automation in the AWS cloud.

Topics include:

- Importance of cloud computing and different cloud service models.
- Account management, billing, and pricing models.
- Compute services such as AWS EC2 (virtual machine), Lambda (Serverless), and Step Functions.
- Storage services such as EBS, S3, RDS, and DynamoDB.
- Autoscaling, monitoring, securing resources, and best practices.
- Other common services such as IAM, API Gateway, Cognito, and CloudFormation.

Course Benefits

- Hands-on experience in next-generation modern technologies and architectures in the cloud.
- Ace technical interviews.
- Your personal website with a reliable, highly scalable, cloud-native back end.
- Skills to pass highly-reputed exams in the IT industry.
- You will become a shiny software developer to adapt to a real-life environment easily in the US.

Evaluation Criteria

Midterm Exam	35%
Final Exam	35%
Final Project	20%
Assignments	10%
Etiquette	0 – 3%

A+	97 - 100
A	92 - 96
A-	88 - 91
B+	84 - 87
B	79 - 83
B-	75 - 78
C+	71 - 74
C	66-70
C-	62-65

Important points

- Email me an interview schedule or letter from a nurse if needs a day off.
- **Read slides daily**. Most questions of the exam are from slides. The rest is from my talk.
- I will not micromanage and will NOT require you to do the exact same thing I did in the recording, for instance, name your resource this way or it has to be in this folder, etc. Understand the big picture of what you are asked.
- Don't blindly follow recordings to do assignments.
- Do not ask for extra credit at the end of the semester.

Other points:

- Teams are how you receive time-sensitive announcements.
- It is a five-hundred-level course for a master's degree. That means the course would be challenging. Getting overwhelmed is how you grow. Remember, I am here to help. Please contact me and I will give you a one-on-one session to make things clearer.
- Being on time in class. Be present at 09:50 am and settle down. When late, you draw everyone's attention.
- Please don't get sick. You must bring a letter from the nurse when come back.
- It is important to plan ahead. Students who wait until the last minute to do their work usually receive lower grades and are more likely to miss deadlines.
- Encourage everyone to ask questions. But remember, pay careful attention all the time in class. Some students don't pay attention and ask me a question that I have already explained many times. Whereas students who ask smart questions are recognized.
- Highly encourage you to do extra tasks and research. Share some important cloud concepts, service features, or best practices in your own words with your classmates on Teams. Come to me and explain what you learned in person. You will be recognized and will have a high chance to receive an A with an honor.
- Let's connect on LinkedIn. Message me after the course. I will endorse you. If you do something impressive as your final project, I will write about that on your LinkedIn profile.
- Please don't share recordings, course, and exam materials with anyone else. These are copyrighted.
- During lab time, I will review the previous day's homework in person and give you feedback. Come to class and try to complete lab tasks.
- Submit your assignments in one PDF with screenshots and links to your resources on time on Sakai. No late email submission.
- Don't blindly follow recordings to do assignments. Understand the big picture of what you are asked. If you are confused, ask me and GSAs anytime.
- Sometimes watching the record and reading the slides over and over again is not effective. Some concepts become much clearer and you will have the "aha" moment when you do hands-on in the AWS console. Get your hands dirty.
- Take note. Your brain digests the concepts effectively as writing. It helps you succeed in the course. Most parts of the exam are theory.
- Please, don't stress too much about grades. That is counter-effective.

Student testimonials

Every block I receive such testimonials. These are testimonials from the class at the time I am writing this.

“I wanted to express my appreciation for the chance to attend your course. It was an honor to learn from you, as you delivered the material in a manner that was both lucid and comprehensible. I wanted to take a moment to acknowledge the high quality of your lectures. With the current job market being competitive, I recognize the value of the education you provided. Thank you!”

“Thank you, professor. I really enjoyed the course and It helps me with the interview. I did 2 interviews after I had a basic understanding of AWS. And they were happy when I talk about my AWS experience.”

“First of all, I would like to express my gratitude to you, You impressed me not only as a professor but you are also an amazing human being. You are a role model. This course was very interesting, I enjoyed each and every session. I’m so glad to have a professor like you in my life, and I hope we can stay in contact. Thank you for everything.”

“Really appreciate the passion with which you taught us. I really enjoyed this course and learned a whole new world. Thank you so much!”

“I want to thank you for your dedication and for this amazing course. I really enjoyed every bit of it. Every service and concept makes sense. And I'm happy that I got to study it with you. Thank you for the best wishes, and I hope we cross each other's paths again. I hope you have success in your work too”

Contact Info

Unubold Tumenbayar
Instructor of Computer Science
Email: utumenbayar@miu.edu
McLaughlin #209

Class attendance

Attendance at all classes is required because all elements of class — lectures, questions, answers, discussions, and laboratory work — contribute to the learning process. Absences are usually excused only if you are sick in bed or have a family emergency.

If you must miss a class, please let your instructor know ahead of time. Call, send an email, or send a note to a friend. There is no such thing as a “personal day.” If you have personal business to take care of, please schedule it for after class or during the days between blocks. At the same time, it may occasionally be necessary for you to miss a class (or part of a class) for some reason other than an illness or family emergency. Please speak with the instructor beforehand, who will be open to considering your needs.

The first lesson of each course is the most important. Students are expected to be present from the first lesson onward. Any student not present on the first morning (except for such compelling reasons as illness or family emergency) may be asked to withdraw from the course. Unexcused absences may result in the student receiving a grade of NC (No Credit) for the whole course.

Punctuality

Punctuality is expected and required in the professional world. People commonly lose their jobs for being late — especially new college graduates unfamiliar with professional expectations. Colleges and universities have come under criticism for not properly preparing students for these values.

Therefore we place a similarly high value on arriving on time for every class session. If students are late, they disrupt the learning environment and may miss the wholeness of the lesson. Coming late is unprofessional and shows a lack of courtesy to the instructor and to fellow students.

Thus the faculty request that students arrive a couple of minutes early, so everyone is seated and settled when the class begins. Well begun is half done.

Punctuality also extends to returning from the class break in a timely fashion (as announced by the professor at the beginning of the break). The instructor should not need to go out and round up students.

If you need to be late to class for some reason beyond your control (a dentist appointment, for example), please arrange that with me ahead of time.

Class participation

American companies (and universities) expect employees (and students) to be active participants in discussions about projects and plans. This is in contrast to many other cultures in Asia and Africa that many of our students are from. Our classrooms are a great environment to get used to being a more active participant. Being an active participant means volunteering information and asking questions from your side—i.e., raising your hand to make a comment or ask a question without being prompted by the professor. This should always be done in a polite manner, but it is not sufficient to sit silently and passively unless called upon.