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Spring 2024

CS 643-856: Cloud Computing

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CS 643 Cloud Computing - Spring 2024 - Syllabus

Faculty Contact Information

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Virtual Office Hours: Tuesday 7-8 P.M. ET

Link for Office Hours: https://calendar.app.google/MipCvYLRJgcqQHdj6 ↪

Short Description

The course presents a comprehensive view of cloud computing, from platforms and services to programming and infrastructure. We'll explore topics like the advantages of cloud computing, the services offered by major providers like Amazon Web Services (AWS), Google Cloud, and Microsoft Azure; The course will introduce students to various services available from Cloud providers.

We will use AWS as the Cloud Provider to learn about the service offerings, programming labs and understanding the cloud concepts. The course will also introduce the students to virtualization, storage, networking and containerization.

The course includes Knowledge checks, Hands-on Labs, AWS Topic presentation presentations.

Learning Outcomes

Upon the successful completion of this course, the student should be able to:

- Analyze the trade-offs between deploying applications in the cloud and over local infrastructure
- Compare the advantages and disadvantages of different types of cloud platforms
- Deploy applications over Public cloud platforms
- Hands-on lab work to accelerate your knowledge about services that Public Cloud providers offer
- Analyze the performance, scalability, and availability of the cloud systems and applications
- Learn about Cloud services and Identify security and privacy issues in the cloud
- Present session on Cloud Computing topic

Why Take This Course?

Cloud computing represents a major paradigm shift in computing from the era of personal computers to the era of computing as utility. Most major Internet services are already deployed in the "the cloud." We store most of our data in "the cloud" and execute most applications from "the cloud." This course is aimed at all graduate students (both M.S. and Ph.D. students) who want to learn how to design and program cloud services and applications as well as how to build and administer cloud systems. By studying real-world systems developed in industry, students will acquire cutting-edge knowledge that may be a major advantage when searching for a job.

Lectures and Readings

There is no book required for this class. The course will include material from AWS Academy. The slides for each lecture will be posted online in canvas. The records/lecture will be available via Canvas. The readings should be used as reference material to clarify and add details to lectures.

Exams:

- **Two Exams**: There will be two exams: Cloud Foundations Exam and Cloud Developing Exam.

- **Exam Format:** The exams will be conducted in-person at NJIT

- **Closed Book**: Both exams are closed book, meaning there will be no access to materials during the test. This includes papers and notes.

- **Exam policy** : The exam will be conducted In-person at the NJIT campus.

- **Make-Up Exam**: In case you miss an exam, a make-up exam may be taken. However, this can only be done after providing written documentation to the Dean of Students. Be sure to follow the proper procedure if you miss an exam.

Homework

Hands-on Labs will be the homework assignments. Students are expected to follow along the hands-on lab and take screen-recording of the lab completion. Details of the instructions to record the lab will be provided. Homework will include quizzes about individual topics.

Programming Assignments

There are no programming assignments in the course. Instead, you will be working on Hands-on labs.

Topic Presentation

Students will present individually about one AWS Service/Topic. The AWS Presentation covers services that are offered in cloud computing. The video recordings of presentation need to be uploaded students into Canvas for the whole class to watch.

Grading

Topic	Percentage of final grade
Topic quizzes / Knowledge Checks	10%
Hands-on Labs - AWS Academy	15%
Hands-on Labs - Recording	15%
Cloud Topic Presentation	20%
Midterm exam	20%

Final exam	20%
Extra credit - Submitting all homework and presentations on time	1%
Extra Credit - AWS Academy Cloud Foundations Digital Badge	2%
Extra Credit - AWS Academy Cloud Developing Digital Badge	2%
Extra Credit - AWS Certified Cloud Practioner **OR** Microsoft Azure Fundamentals AZ-900	6%

Grading Scale

Grade	Percentage
A	90.00-100.00%
B+	85.00-89.99%
B	80.00-84.99%
C+	75.00-79.99%
C	65.00-74.99%
F	0-64.99%

At the discretion of the instructors, the grading may be done on a curve.

Time Commitment

The students are expected to allocate 8-10 hours per week to study and work on the assignments for this course.

Submitting Assignments and homework:

In this course, we value punctuality and the commitment to meet deadlines. Assignments are expected to be submitted on or before their due dates. Any submission made after the specified deadline will incur a penalty. For each day of delay, points will be deducted from the assignment score. Therefore, it is crucial to manage your time effectively to ensure you maximize your performance in the course. Please take note of assignment deadlines and plan your work accordingly to avoid any unnecessary deductions. Your dedication to meeting these deadlines will contribute to your overall success in the course.

Recordings: Recording of the class will be posted to canvas.

Course Schedule:

Week	Date	Coursework
Week 1	Week of Jan 16	**Get Familiar with course, AWS Academy** **Watch course instruction lectures** **Cloud Foundations:** **Module 1 - Cloud Concepts Overview**
Week 2	Week of Jan 22	**Module 2 - Cloud Economics and Billing** **Module 3 - AWS Global Infrastructure Overview**
Week 3	Week of Jan 29	**Module 4 - AWS Cloud Security** **Module 5 - Networking and Content Delivery**
Week 4	Week of Feb 5	**Module 6 - Compute**
Week 5	Week of Feb 12	**Module 7 - Storage** **Module 8 - Databases**
Week 6	Week of Feb 19	**Module 9 - Cloud Architecture** **Module 10 - Auto Scaling and Monitoring**
Week 7	**Mar 2** **(Saturday 4pm-** **5:15pm EST)**	**Cloud Foundations Exam**

Week 8	Week of Mar 4	**Cloud Developing:**
		
		     Module 2: Introduction to Developing on AWS
		
		     Module 3: Developing Storage Solutions

Week 9	Mar 10 - Mar 16	**Spring Break**
Week 10	Week of Mar 18	**Module 4: Securing Access to Cloud Resources**
Week 11	Week of Mar 25	**Module 6: Developing REST APIs**

Week 12	**Week of Apr 1**	**Module 7: Developing Event-Driven Serverless Solutions**
Week 13	**Apr 14**	**Cloud Topic Presentations Due**
Week 14	**Week of Apr 15**	**Module 8: Introducing Containers and Container Services**
Week 15	**Week of Apr 22**	**Module 9: Caching Information for Scalability**
Week 16	**Week of Apr 30**	**Prep week for Final exam**
Week 18	**May 4 (Saturday 4pm-5:30pm EST)**	**Cloud Developing - Final Exam**
	May 10	**Last day to submit Extra Credit**

Academic Integrity

Academic Integrity is the cornerstone of higher education and is central to the ideals of this course and the university. Cheating is strictly prohibited and devalues the degree that you are working on. As a member of the NJIT community, it is your responsibility to protect your educational investment by knowing and following the academic code of integrity policy that is found at this link: University Policy on Academic Integrity ⤳.

Please note that it is my professional obligation and responsibility to report any academic misconduct to the Dean of Students Office. Any student found in violation of the code by cheating, plagiarizing or using any online software inappropriately will result in disciplinary action. This may include a failing grade of F, and/or suspension or dismissal from the university. If you have any questions about the code of Academic Integrity, please contact the Dean of Students Office at dos@njit.edu.