Graduate School of Management University of California -- Davis

BAx 493 Topics in Business Analytics - Cloud Computing

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Course Description:

Cloud Computing is on-demand computing. With cloud computing, large upfront investments are replaced by metered services similar to utilities like gas and electricity. Some of the advantages of cloud computing are variable expenses, economies of scale, elasticity, agility, comparative advantage, and global reach. This course covers the foundations of cloud computing models including (laas) Infrastructure as a Service, (Paas) Platform as a Service and Software as a Service (SaaS). Restricted to students enrolled in MSBA program.

Course Objectives:

This course aims to empower the student with an understanding of the building blocks of cloud computing and enable the student to architect business applications using the cloud. The student will also be able to articulate the business drivers in choosing a cloud based application model vs traditional models in IT.

- 1. Overview of Cloud Computing
- 2. Compute Power in the Cloud
- 3. Data Storage in the Cloud
- 4. Networking in the Cloud
- 5. Data Processing and Analytics
- 6. Added Value Services in the Cloud
- 7. Architecting an Application and IT infra strategy

The theory behind the course is agnostic to any specific cloud provider. Assignments will be built within the Google Cloud Platform.

Class Format:

- 1. Lecture
- 2. Group Assignment
- 3. Final Exam

Class Rules

Academic Honor Code All students are expected to adhere to the University of California, Davis' Code of Conduct as noted here: http://sja.ucdavis.edu/files/cac.pdf. Please also note that if "academic misconduct is admitted or is determined by adjudication to have occurred," per Regulation 550 the student could potentially receive a grade of "F" not only for the assignment or project in question, but also for the *entire course*.

Use of Electronics in Class You are allowed to use your laptop/tablet in class – however this use is conditional. You cannot use your laptops for any other activity other than those pertaining to the class. Hence, surfing, emailing, chatting, facebook visits and other related activities are not allowed. If such activity is observed in class, then laptop privileges will be revoked – *for the entire class*. Smartphone/phone use is not allowed in class – you are welcome to step out of class, with my permission, if you need to answer a call. Failure to comply with this policy will result in the creation of 'laptop zones' (e.g., only the first two rows will be allowed to use laptops).

Course Material

- 1. Google Cloud Platform in Action 1st Edition by JJ Geewax
- 2. Architecting the Cloud: Design Decisions for Cloud Computing Service Models (SaaS, PaaS, and IaaS) (Wiley CIO) 1st Edition, Kindle Edition by Michael K Jarvis

Grading

- Exam 40%
- Final Project 50%
- Assignments 10%

Lecture Outline

Lecture	Theory	Practice	Reading	Qwiklabs
Course Overview, Cloud Storage	 Course Overview Cloud Computing overview Cloud Service Models 	 Google Cloud Platform Overview Google Cloud Storage 	 ATC Chapters 1-3 GCP Part 1-2 	To be posted on Canvas
Requirements Analysis, Cloud Compute	• Design and Architecture -	ComputeVirtual MachinesKubernetes	 ATC Chapters 4-5 GCP Part 3 	To be posted on Canvas

	How to get there? • Translation of Business Requirement s into Design • Service Models Deep Dive	 Serverless Functions Networking / Cloud DNS 		
ML Services on GCP Data Processing, Analytics (Part I)		 Image recognition NLP Auto ML Data Processing and Analytics in Google Cloud 	 GCP Part 4 and 5 	To be posted on Canvas
Data Processing, Analytics (Part II) Cloud Services & Data Security	 RESTful services Data Security SLA Management 	 Data Processing and Analytics in Google Cloud 	 GCP Part 5 (cont) ATC Chapters 6-11 	To be posted on Canvas
Presentations & Final				

The Team Project

You have been tasked by the Oakland Athletics to define the future of video based analytics to predict success of current and future baseball players.

Prompt: Determine the KPIs that you would infer from video analysis to predict success. Build a visual prototype of the end to end application.

Assumptions:

- You have access to past Oakland A's game video (1980-2019) stored on prem in a local data center, without any metadata.
- You can obtain API access to video streams for any other player (past, other teams, high school, college)

Project Topic 1 - Analyze the Compute Power options of AWS, GCP, Azure, and Oracle Cloud. Provide a recommendation for computing the KPIs that you have determined, with the dimensions of cost and performance in mind.

Project Topic 2 - Determine the best Cloud Storage option to maximize flexibility and minimize cost.

Project Topic 3 - Determine how best to orchestrate the Networking interaction between an On - Prem data center and compute power in the cloud

Project Topic 4 - How will video intelligence and vision APIs fit the end solution, specifically around metadata capture

Your team will deliver a 5-10 min presentation based on your findings. The presentation should cover all project topics.

Other topic ideas:

- What factors contribute to game day attendance? How do you measure ongoing?
- Topic of your choice (approval required)