

CS 436 Cloud Computing, Spring 2024

Instructor :	Dr. Atay Özgövde, atay.ozgovde@sabanciuniv.edu
Class Meetings :	TBA at registration period
Course Material :	- Course slides & lab sheets - Bagha A., Madisetti V. <i>Cloud Computing Solutions Architect: A Hands-On Approach</i> . VPT, 2019. - Ruparelia, Nayan B. <i>Cloud computing</i> . Mit Press, 2016.
Software & Platforms:	Desktop Virtualization Tools: Vmware, Virtualbox and UTM Practical work on commercial service providers: AWS, GCP and Azure (using free tier)
Grading :	- Projects, Assignments, 20 % - In-class Practices & Quizzes 15 % - Midterm 25 % - Final Exam 40 %

Subjects to be covered :

1. Introduction
 - a. Cloud Computing Definition & Models
 - b. Concepts & Technologies
 - c. Services & Platforms
 - d. Programmatic Access to Cloud Service Providers
2. Virtualization
 - a. Hypervisor types
 - b. Virtual Machines
 - c. Containers
 - d. Container Orchestration using Kubernetes
3. Cloud Computing Infrastructure
 - a. Availability Zones and Regions
 - b. Cloud Networking
 - c. Elasticity of Cloud Performance
 - d. Vertical vs Horizontal Scaling
 - e. VM migration
4. Cloud Application Development
 - a. Application Design Methodologies
 - b. Serverless Computing
 - c. Use cases and reference development models
 - d. Cloud App & Resource Monitoring
 - e. Data storage types in cloud systems
5. Cloud Security and Compliance
 - a. Cloud security challenges and threats
 - b. Identity and access management in the cloud
 - c. Security best practices in the cloud
6. Trending Topics in Cloud Computing
 - a. AI Services in the Cloud: AI as a Service (AIaaS)
 - b. Cloud IoT Services
 - c. Cloud Computing for Industry 4.0
 - d. Edge Computing

Practical work (in-class practices) : Part of the lectures will be dedicated to practical sessions where some of the above given concepts will be demonstrated in a hands-on manner. These sessions will be graded where students will be expected to complete tasks using their own laptop computers.