

## CS 436 Cloud Computing, Spring 2025

<b>Instructor :</b>	Dr. Atay Özgövde, atay.ozgovde@sabanciuniv.edu	
<b>Class Meetings:</b>	THU 13.40-16.30 FASS 1010 (Classroom for ICPs will be announced)	
<b>Course Material:</b>	- 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.	
<b>Software &amp; Platforms:</b>	Desktop Virtualization Tools: Vmware, Virtualbox and UTM Practical work on commercial service providers: GCP (using free tier), various Cloud tools and software including Terraform	
<b>Grading:</b>	- Projects, Assignments,	20 %
	- In-class Practices & Quizzes	15 %
	- 1 Midterm	25 %
	- Final Exam	40 %
<b>Subjects to be covered :</b>		

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

### Please read carefully:

**Practical work (in-class practices) :** Part of the lectures will be dedicated to practical sessions where 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. Only students carrying laptops with them can attend the ICPs.

→→→ 80% attendance to In-Class Practices is required to pass the course.

→→→ Students Quizzes and ICPs will not announced beforehand, please don't ask for their schedule.

→→→ Students who cannot take the midterm exam with a valid excuse approved by the university will attend the final make-up exam during the final exam period covering all semester topics.