CS 436 Cloud Computing, Spring 2024

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Class Meetings: TBA at registration period

Course Material:
- Course slides & lab sheets

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 Orchastration 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.