# CS 255 System Design Document

## UML Diagrams

### UML Use Case Diagram

*A diagram of a system

Description automatically generated*

### UML Activity Diagrams

*A diagram of a customer service

Description automatically generated*

A diagram of a system

Description automatically generated

### UML Sequence Diagram

*A diagram of a graph

Description automatically generated*

### UML Class Diagram

A diagram of a software program

Description automatically generated with medium confidence

## Technical Requirements

Technical requirements for the system's design emerge from the class diagram and the connections established between classes. These requirements encompass various aspects, including hardware, software, tools, and infrastructure. Firstly, on the hardware front, robust server capabilities are essential for hosting system components such as web servers and databases. Adequate storage capacity is also necessary to accommodate user data, course details, reservations, and system logs. Additionally, networking equipment like routers, switches, and firewalls plays a crucial role in ensuring secure communication between system elements and users.

In terms of software requirements, several key components are needed for the system's development and operation. This includes a reliable web application framework for facilitating development, a capable database management system (DBMS) for efficient data management, and suitable programming languages for backend and frontend development. Furthermore, the utilization of tools such as version control systems, integrated development environments (IDEs), and web servers is essential for supporting coding, collaboration, and web page delivery. Integration with compatible operating systems is also imperative for hosting the web application effectively.

Moreover, various tools and libraries are indispensable for system development and security enhancement. This includes UML modeling software for diagram creation, frontend frameworks for building interactive user interfaces, and dependency management tools for managing project dependencies and libraries. Additionally, security libraries are vital for implementing authentication, authorization, and encryption mechanisms to safeguard user data and system resources.

Infrastructure requirements play a significant role in ensuring the system's scalability, reliability, and performance. Cloud hosting on platforms like AWS, Microsoft Azure, or Google Cloud Platform is recommended for scalable and reliable hosting. Load balancing mechanisms are essential for distributing incoming traffic across multiple servers, ensuring high availability and performance. Robust backup and disaster recovery strategies are also necessary to minimize data loss and system downtime. Furthermore, efficient monitoring and logging tools are vital for monitoring system performance, detecting anomalies, and logging events for troubleshooting and auditing purposes. Addressing these technical requirements comprehensively ensures the effective design, development, deployment, and maintenance of the DriverPass system, aligning with project objectives and user expectations.