# CS 255 System Design Document Template

This template lays out all the different sections that you need to complete for Project Two. Each section has guidance to prompt your thinking. You will need to continually reference the interview transcript as you work to make sure that you are addressing your client’s needs. There is no required length for the final document. Instead the goal is to complete each section based on what your client’s needs are. Remove this note when you are finished, and replace all bracketed text with the relevant information.

## UML Diagrams

### UML Use Case Diagram

A screenshot of a computer

AI-generated content may be incorrect.

### UML Activity Diagrams

A diagram of a flowchart

AI-generated content may be incorrect.

A diagram of a flowchart

AI-generated content may be incorrect.

### UML Sequence Diagram

*A diagram of a software company

AI-generated content may be incorrect.*

### UML Class Diagram

*A screenshot of a computer

AI-generated content may be incorrect.*

## Technical Requirements

**Hardware Requirements**

**Server Infrastructure:**

* Cloud-based hosting platform (AWS, Azure, or Google Cloud)
* Minimum 4 CPU cores with 8GB RAM for application server
* Minimum 2 CPU cores with 4GB RAM for database server
* 500GB initial storage capacity with auto-scaling capabilities
* Load balancers for high availability and traffic distribution

**Client Requirements:**

* Any device capable of running modern web browsers (desktop, laptop, tablet, smartphone)
* Minimum 2GB RAM for optimal performance
* Internet connectivity with minimum 1 Mbps download speed
* Modern web browser (Chrome, Firefox, Safari, Edge - latest versions)

**Software Requirements**

**Server-Side Technologies:**

* Web application framework (Node.js with Express, or Java Spring Boot)
* Database management system (MySQL or PostgreSQL)
* Web server software (Apache or Nginx)
* SSL/TLS certificates for secure HTTPS connections
* API gateway for external integrations (DMV systems)

**Development and Deployment Tools:**

* Version control system (Git)
* Continuous Integration/Continuous Deployment (CI/CD) pipeline
* Container orchestration platform (Docker/Kubernetes)
* Monitoring and logging tools (CloudWatch, New Relic, or similar)
* Backup and disaster recovery solutions

**Client-Side Technologies:**

* HTML5, CSS3, JavaScript for responsive web interface
* Progressive Web App (PWA) capabilities for mobile optimization
* Modern JavaScript framework (React, Angular, or Vue.js)
* Cross-browser compatibility testing tools

**Security and Compliance Tools**

**Authentication and Authorization:**

* Multi-factor authentication (MFA) system
* Role-based access control (RBAC) implementation
* Session management and timeout controls
* Password encryption and hashing (bcrypt or similar)

**Data Protection:**

* SSL/TLS encryption for data in transit
* AES-256 encryption for sensitive data at rest
* Payment Card Industry (PCI) compliance tools for credit card processing
* Regular security vulnerability scanning tools
* Web Application Firewall (WAF) protection

**Integration Infrastructure**

**External System Connections:**

* DMV system integration APIs
* Payment processing gateway (Stripe, PayPal, or similar)
* Email service provider for notifications (SendGrid, AWS SES)
* SMS service for appointment reminders (Twilio or similar)
* Calendar integration services (Google Calendar, Outlook)

**Data Management:**

* Database replication for high availability
* Automated backup systems with point-in-time recovery
* Data archiving solutions for historical records
* Performance monitoring and optimization tools
* ETL (Extract, Transform, Load) tools for reporting

**Performance and Scalability Requirements**

**Performance Specifications:**

* Maximum 3-second page load times
* Support for 500+ concurrent users
* 99.9% system uptime availability
* Auto-scaling capabilities based on traffic demand
* Content Delivery Network (CDN) for static asset delivery

**Monitoring and Analytics:**

* Real-time performance monitoring dashboards
* User activity tracking and analytics
* System health monitoring and alerting
* Capacity planning and resource utilization tracking
* Error logging and debugging tools

**Compliance and Regulatory Requirements**

**Data Privacy and Protection:**

* GDPR compliance for data protection (if applicable)
* CCPA compliance for California residents
* Regular security audits and penetration testing
* Data retention and deletion policies
* Privacy policy and terms of service implementation

This technical infrastructure ensures the DriverPass system meets all functional requirements while providing a secure, scalable, and reliable platform for driver training services. The cloud-based architecture allows for flexibility and cost-effective scaling as the business grows, while the comprehensive security measures protect sensitive customer and business data.