# CS 255 System Design Document Template

## UML Diagrams

### UML Use Case Diagram

Diagram

Description automatically generated

### UML Activity Diagrams

Purchase Package Activity Diagram:

Diagram

Description automatically generated

Login Activity Diagram:

Diagram

Description automatically generated

### UML Sequence Diagram

Driving session Sequence Diagram:

Diagram

Description automatically generated

### UML Class Diagram

Diagram

Description automatically generated

## Technical Requirements

The first technical requirement for this system would be for logging in and authenticating credentials of a user when they login. For the DriverPass System, I have decided that each user gets five chances to get their password correct, or the system will lock them out. Five attempts is more than enough to account for any human error in the users typing in their password a couple of times, but not too many where someone could have many attempts to try and break into someone else’s account. This will prevent attackers from using any sort of brute force method to try and gain access to the system and require that users log in before being able to sign up for any lessons or packages so that the correct person is getting access to the correct package. Along these lines, the different types of users will be assigned different access levels and privileges according to their role in the system, and this can be updated by the IT Officer. This way, only certain users will be able to see certain information, following the principle of least privilege. When someone needs to reset their password, they will have to answer security questions to verify their identity before they will be given the opportunity to reset their password. Additionally, when it comes to verifying credentials and authenticating a user’s information, when a credit card is used to purchase a package this information will be sent to an outside system to verify that the credit card information is valid to protect against any user trying to scam the system by using a fake credit card.

The second technical requirement for this system is for both maintainability and the reliability of the system. The system is going to be a cloud-based system, so the servers and architecture will be managed by a third party. Since the development firm is hired by DriverPass and not employed by them to maintain the servers and architecture and they only have an IT Officer maintaining the system, a cloud-based system will be used so that the IT Officer can focus on other tasks and not have to look at server health and maintenance or system reliability since this will be maintained by the third-party cloud-server. While this will help DriverPass maintain their system, this will require that any user of the system have access to the internet while accessing information on the system. There is the option to download information for offline usage, but a high-speed internet connection will be required while downloading this information.

Within this cloud server, there will also be multiple tables in a database that stores information for the system. It will have a table of the Users, tables for driving sessions, tables for all of the student packages, and also a table that stores the logging information so that it can be accessed by the IT Officer or the Administrator. These will be on the cloud server and maintained by the cloud server as well.

The third technical requirement for this system will be the performance of the system. Since users will be accessing different trainings such as videos and downloading materials like excel files or large PDF files, the system will need to be able to have enough memory and perform well enough where the training courses aren’t constantly buffering and so the larger files don’t take too long to download. Additionally, when there are updates from the DMV that come in, the system will need to retrieve these updated materials, so the system will also need to be able to handle these downloads. The system must perform well enough so that multiple users could be downloading materials at the same time along with its other normal traffic and it does not affect the speed of access to all the pages on the site for every user.

A fourth technical requirement of the system is the capability for logging. This is important for both the IT Officer to see if there are any errors or issues that have happened or may potentially happen, as well as for the administrator to be able to download all the data from the system and see which users have purchased which packages and signed up for driving lessons. The system will be set up to log errors and information as it is processed, for example if there is a 400 or 500 error, the IT Officer would be able to see this in the logs and be able to investigate a potential issue. The system will also be set up to show records of how many users are, which packages each user has purchased, how many driving lessons they have signed up for, and see the driver’s schedules and notes as well. This allows the administrator to see if there are any errors, for instance, a user signed up for multiple packages on accident, or a user claimed that they purchased a package but don’t have access. This will allow the administrator or IT Officer to be able to see the records and troubleshoot any problems as well as monitor for the health of the system.

A fifth technical requirement of the system is with privacy and integrity of user’s private information. While the IT officer and Administrator can download and see all users in the system, they will not have access to user’s usernames, passwords, address, and any stored Credit Card information. When this information is inputted by the user, it will be encrypted before saved in the database so that their information is save. This will also help to protect against any attacks where the attacker gets access to the database. Even if they get access to the user table, they will only have encrypted information that they get access to and so this adds a layer of security to keep all user’s information safe.

**Resources**

Dennis, A. et. all. (2012). *Systems analysis and design with UML, 4th edition.* John Wiley & Sons.

Lucidchart. (2022). *UML activity diagram tutorial*. Lucidchart. Retrieved from: <https://www.lucidchart.com/pages/uml-activity-diagram>

Lucidchart. (2022). *UML sequence diagram tutorial.* Lucidchart. Retrieved from: <https://www.lucidchart.com/pages/uml-sequence-diagram>

Lucidchart. (2022). *UML use case diagram tutorial*. Lucidchart. Retrieved from: <https://www.lucidchart.com/pages/uml-use-case-diagram>

Valacich, J. S. & George, J. F. (2020). *Modern systems analysis & design.* Pearson.