Southern New Hampshire University

System Design Document

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CS255 SNHU

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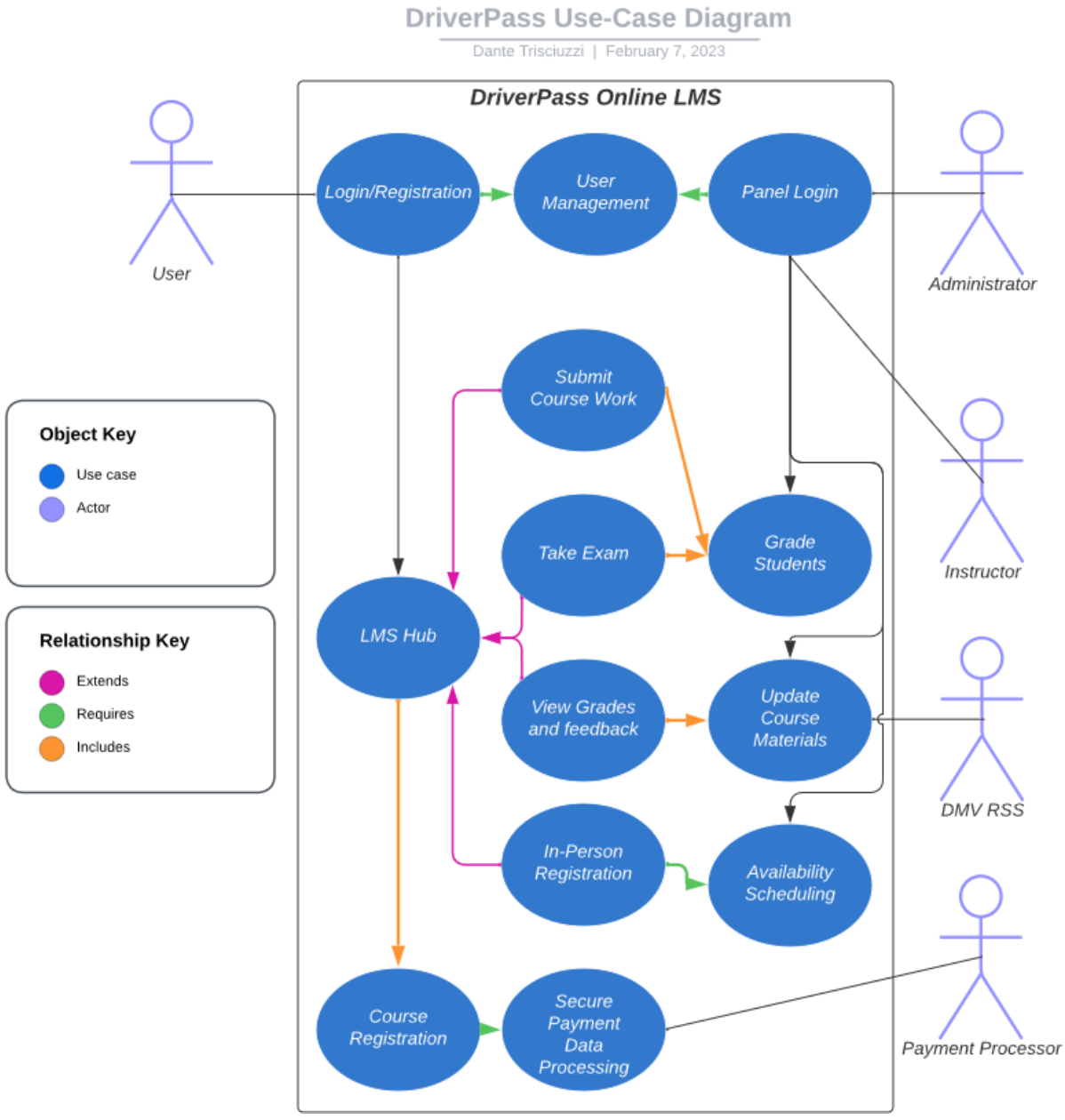
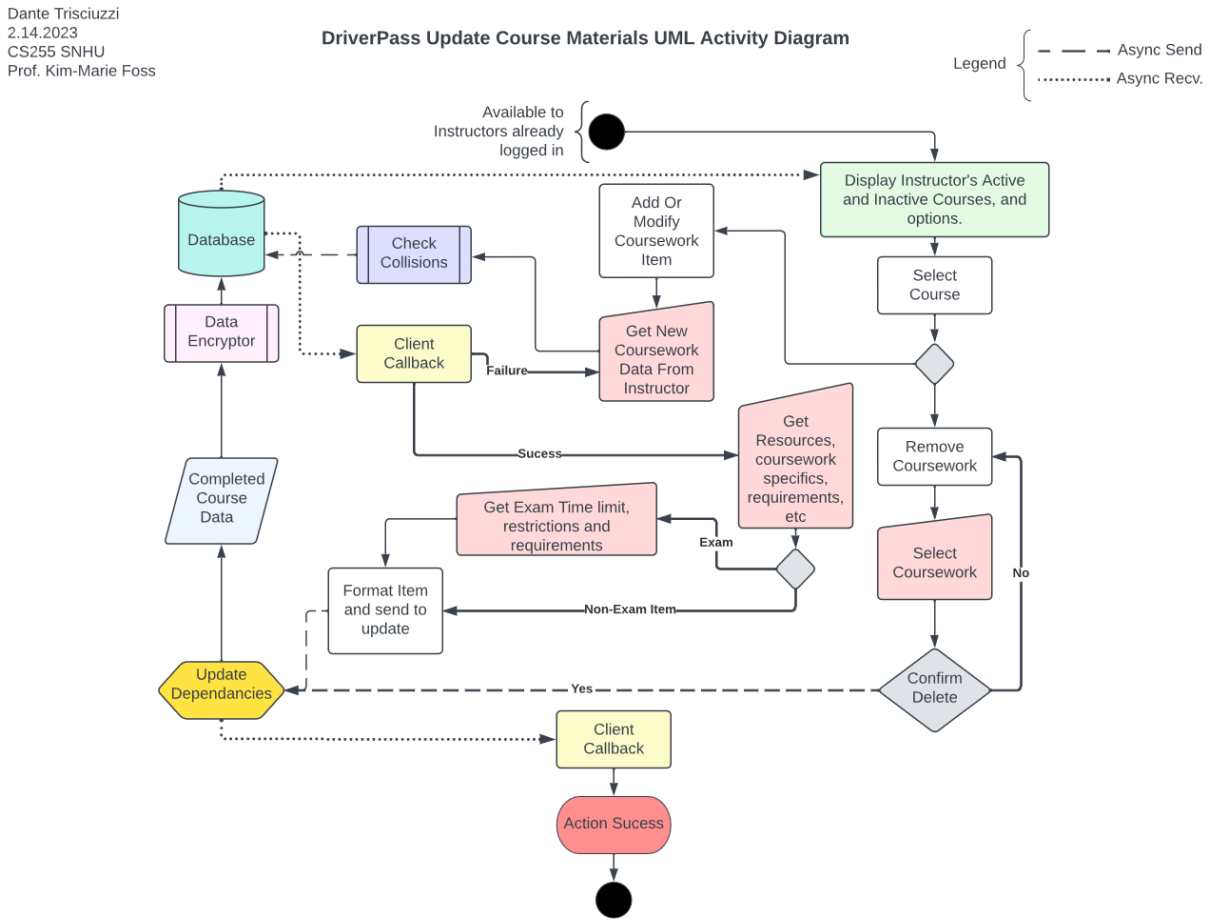
UML Diagrams

UML Use Case Diagram

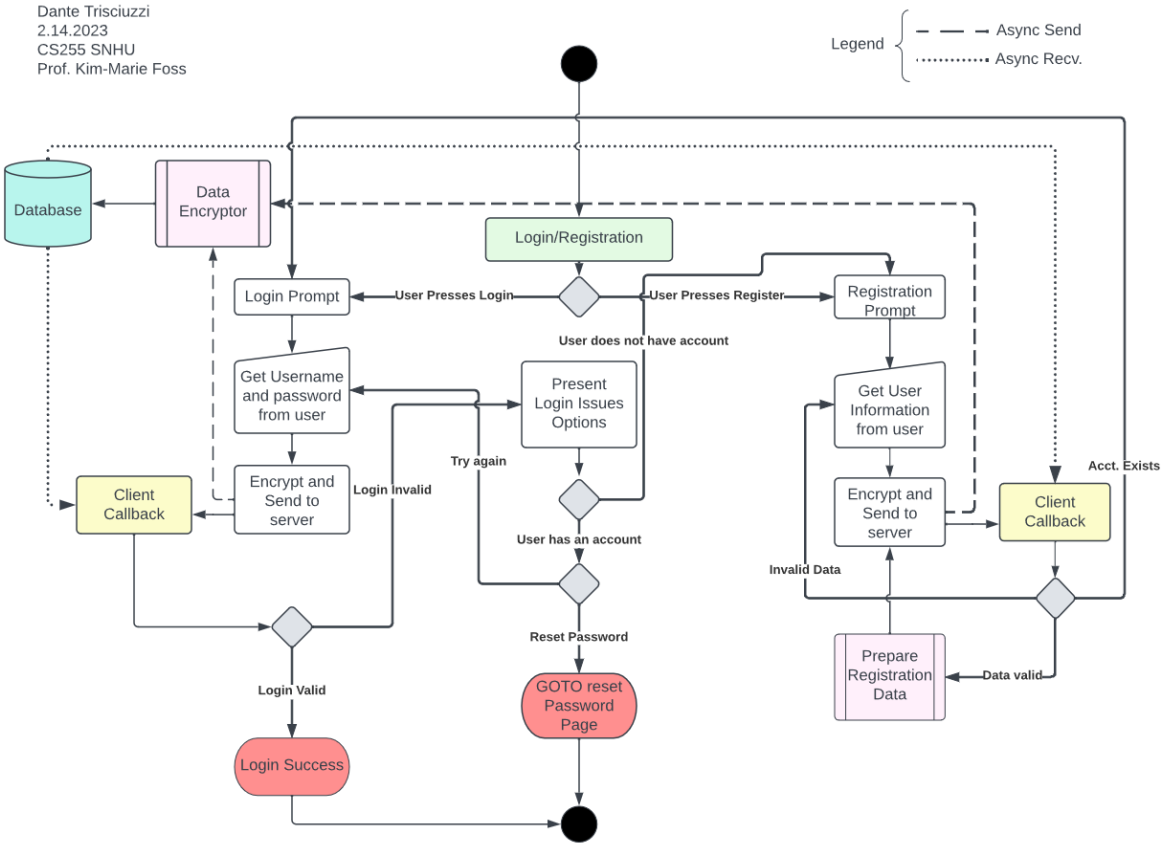


UML Activity Diagrams

I have created UML Activity diagrams for the following use cases: Update Course Materials, and User Login/Registration.

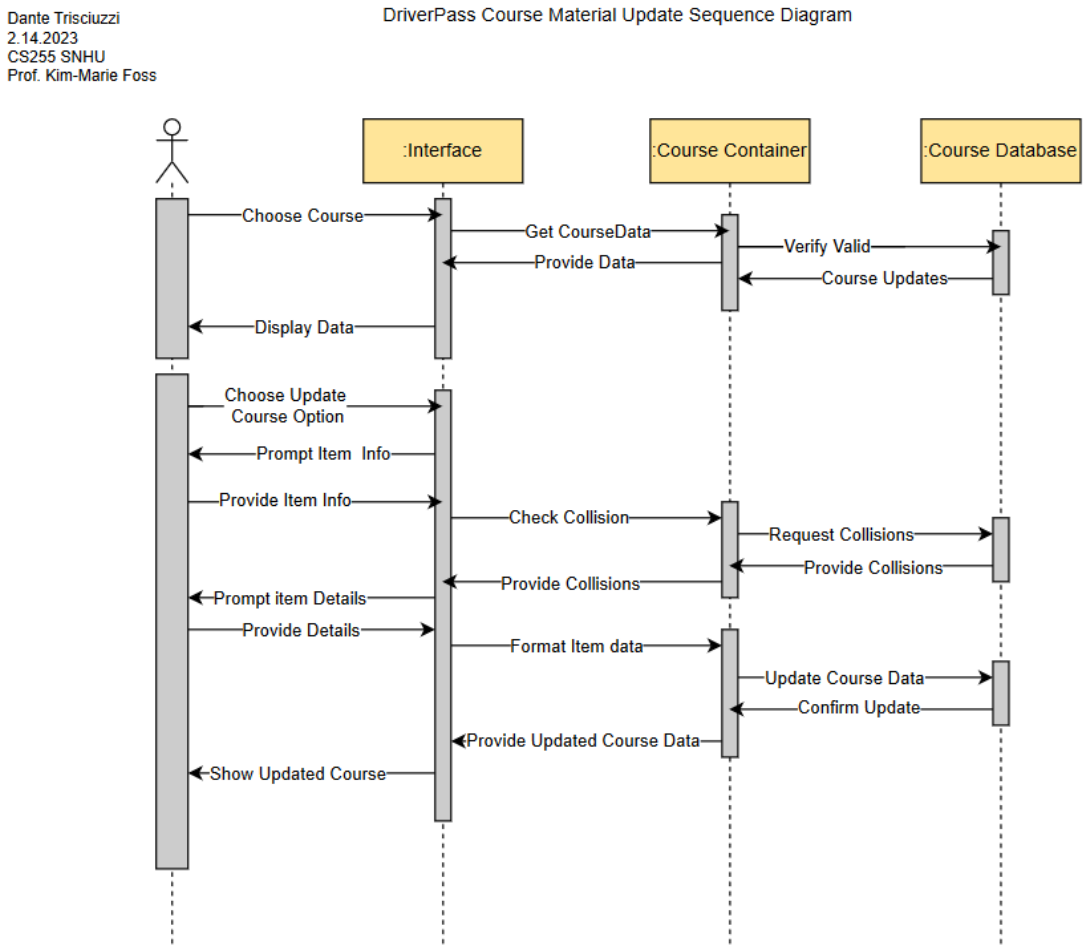


DriverPass User Login/Registration UML Activity Diagram



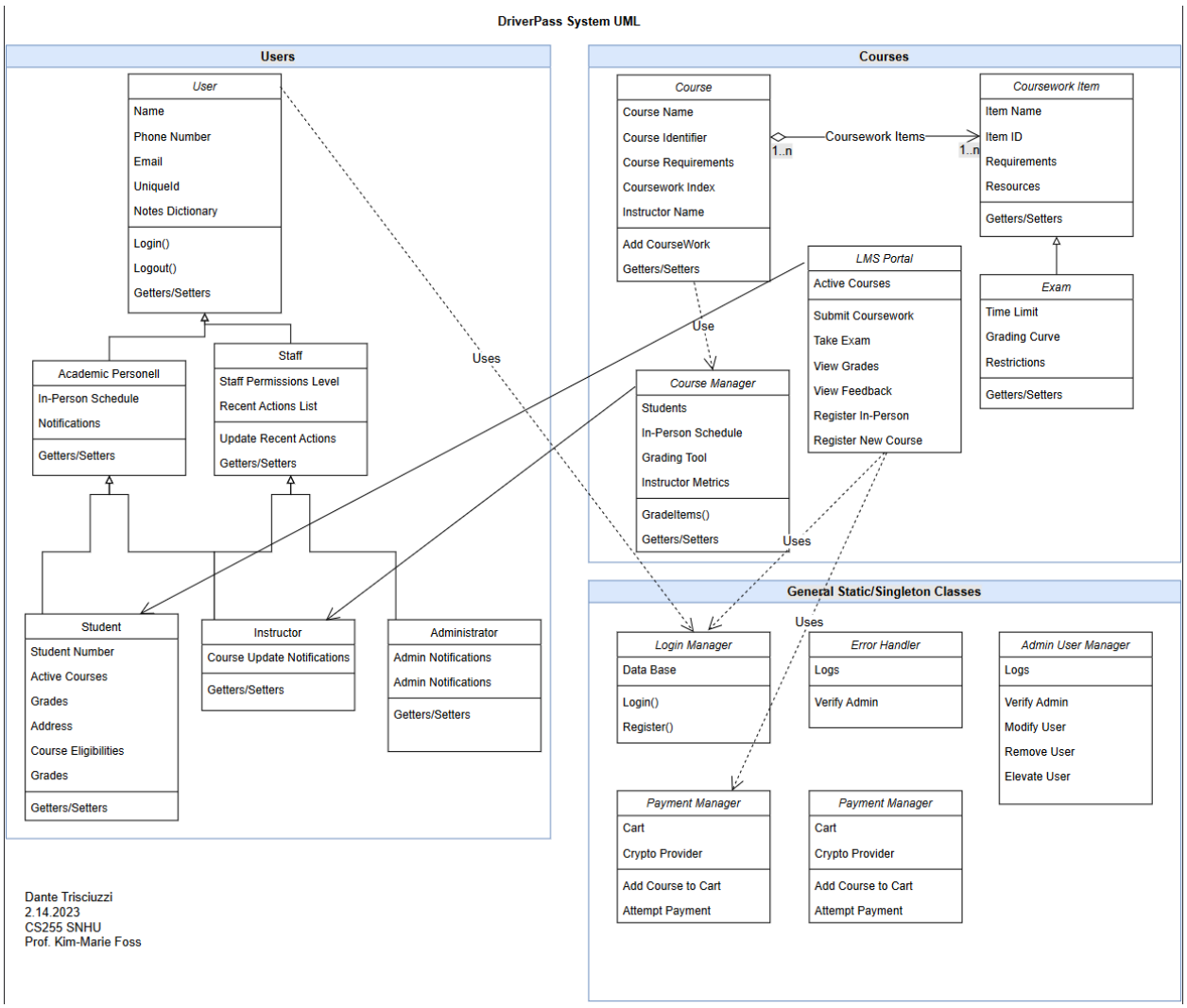
UML Sequence Diagram

I have created this sequence diagram for the user case: Update Course Material Item.



UML Class Diagram

My class diagram covers user types inheritance, course/LMS relationships as well as stand alone/general purpose class objects.



Technical Requirements

Contrary to what the somewhat complex UML designs might suggest, the technical implementation of this system is fairly straightforward. Many of the design patterns outlined above are common and easily accomplishable in modern programming. I suggest using .NET (C#) as the primary backend and Javascript (Typescript perhaps) for the frontend, this provides scalability and maintainability. The use of .NET for the backend allows us many excellent options for database management, including very fast noSql options.

As for hardware requirements, a cloud hosting provider and domain service are the primary requirements, and I also recommend a cloud based firewall service, such as CloudFlare if it fits within the budget. For tooling, modern free-to-use options for IDEs would be more than sufficient, though there are low-cost paid tools that may speed up development such as the JetBrains™ line of products (ReSharper, Rider IDE, Webstorm IDE).

Development effort is expected to be high upfront but as the main LMS framework is laid out, maintaining features should be simple, so long as proper OOP fundamental guidelines are followed. The backend application should be rigorously performance tested and hosted on a pay-for-usage model cloud platform, and the front-end runs in the end user's browser.

Resources

CloudFlare - The Web Performance & Security Company. (2023). Cloudflare. https://www.cloudflare.com/

JetBrains: Developer Tools for Professionals and Teams. (2023). JetBrains. https://www.jetbrains.com/