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## Lab 6: SkillForge UML Design Report

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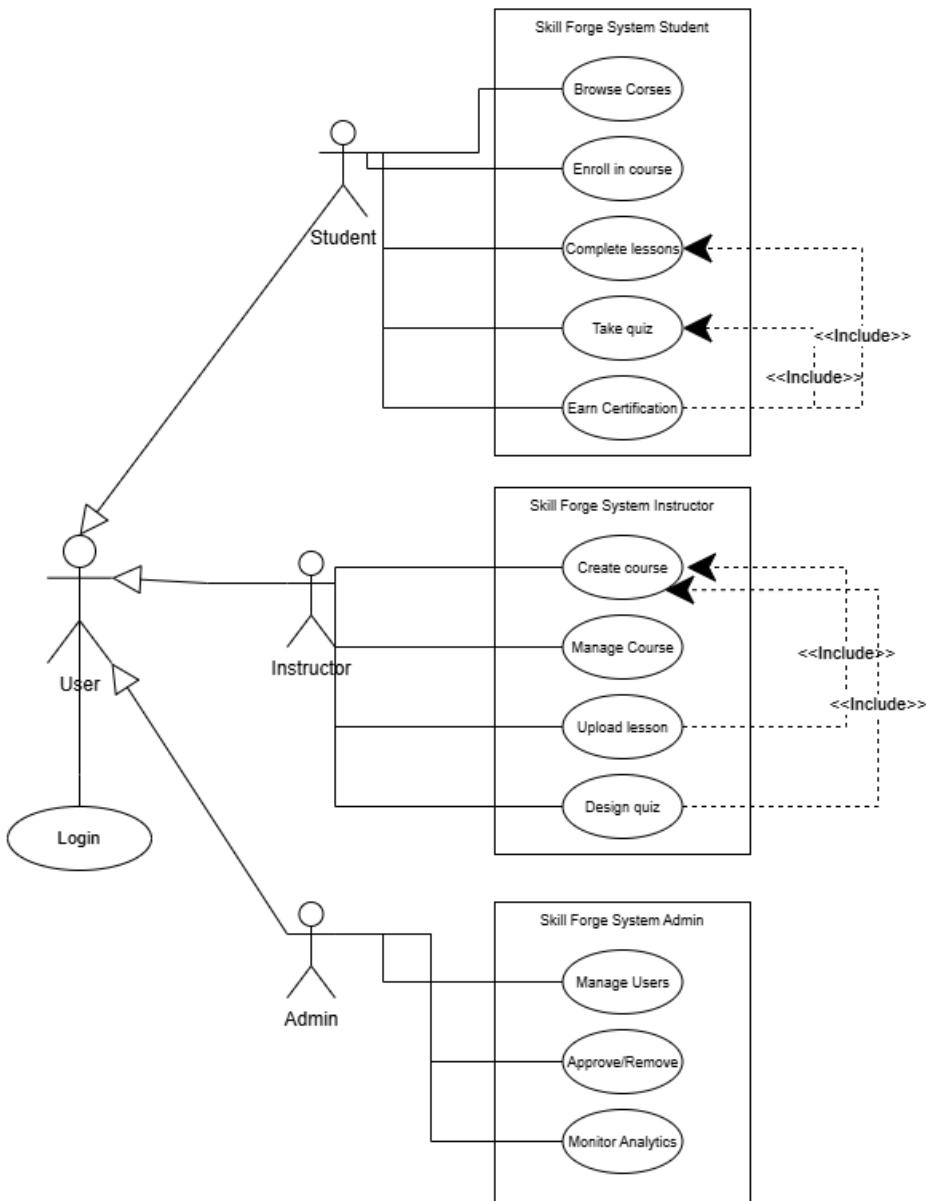
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## Use Case Diagram

### Use Case Diagram

This diagram represents the interactions between the main actors (Student, Instructor, Admin) and the system showing how each user type performs specific actions such as enrolling in courses, creating lessons, or managing users. It helps define system functionality from the user's perspective and clarifies the boundaries and responsibilities of each actor within the SkillForge platform.





### Brief: Use Case

The Student actor can browse available courses, enroll in them, complete lessons, take quizzes, and earn certificates upon successful completion.

The Instructor actor can create and manage courses, upload lessons, and design quizzes to assess student understanding.

The Admin actor manages users, approves or removes courses, and monitors the platform's analytics.

Login use case allows all users to authenticate before accessing the system.

Enroll in Course use case lets students register for a course and access its lessons and quizzes.

Complete Lesson use case represents students studying a lesson's content to make progress.

Take Quiz use case enables students to answer questions and test their knowledge.

Earn Certificate use case is triggered when a student completes all lessons and passes the quizzes.

Create Course use case allows instructors to build new courses and organize materials.

Upload Lesson use case lets instructors add educational content to their courses.

Design Quiz use case enables instructors to create quizzes for evaluation.

Manage Users use case allows admins to add, edit, or remove users.

Approve/Remove Courses use case allows admins to review and control course availability.

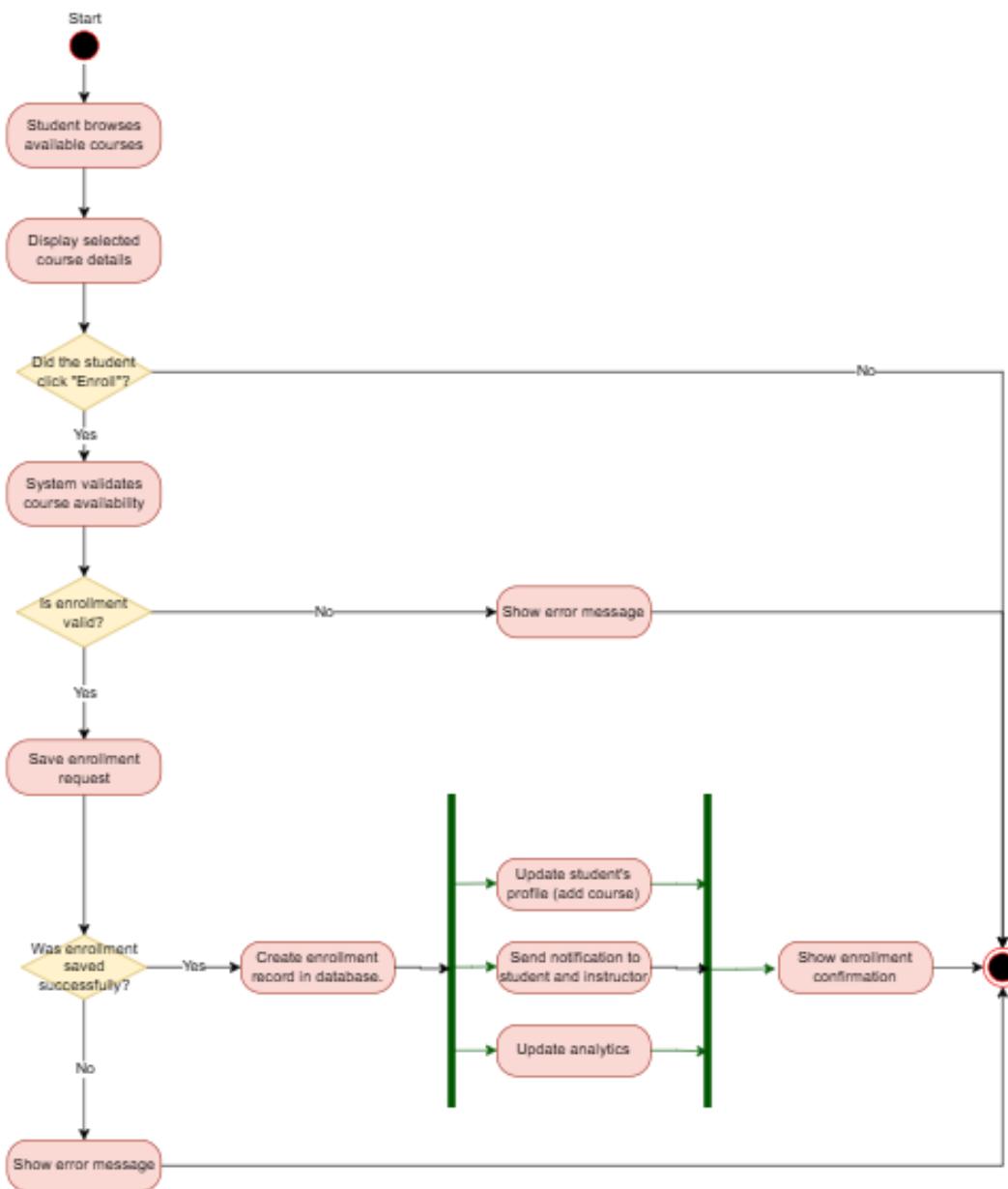
Monitor Analytics use case helps admins track overall platform performance and student activity.



## Activity Diagram

### Activity Diagram:

This activity diagram illustrates the process of enrolling a student in a course on the SkillForge platform. It shows how the system validates course availability, saves enrollment data, and updates related records such as the student's profile, notifications, and analytics. This diagram is important because it helps visualize the workflow and system interactions during course enrollment, ensuring that all steps are correctly handled and potential errors are managed efficiently.





### Brief: Activity Diagram

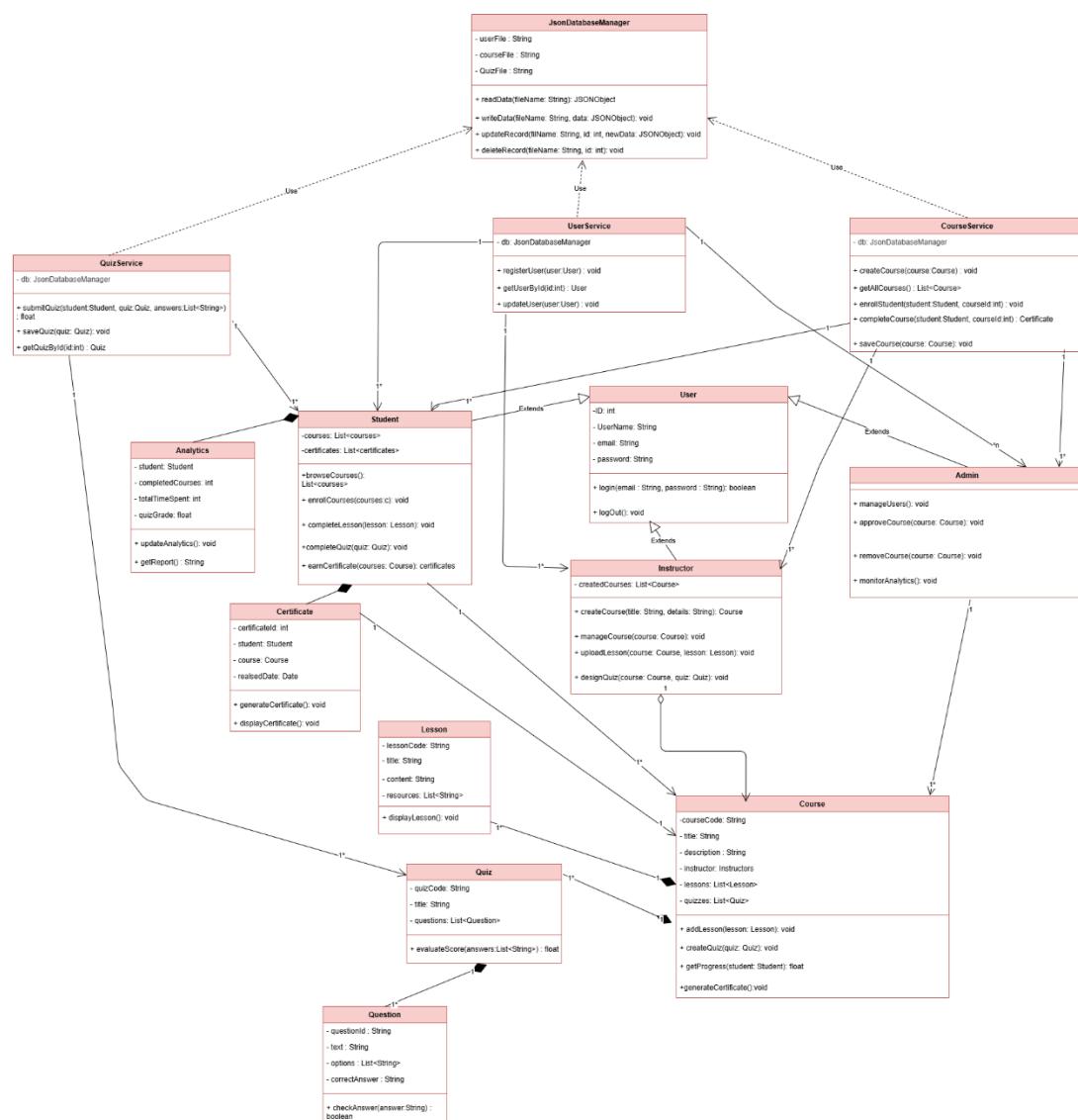
This activity diagram shows the process of course enrollment in the SkillForge platform. It starts when a student browses the available courses and selects one to enroll in. The system then checks if the course is available and if the student meets the requirements. If everything is valid, the enrollment is confirmed, and the system saves the enrollment record. After that, the student's profile and notifications are updated to reflect the new course. If there is any issue, such as the course being full or unavailable, the system shows an error message.



## Class Diagram

### Class diagram

This class diagram shows the classes used so we can able to use it before writing our main code , so here there is user who represents the super class and Student,instrucor,admin are its subclasses(extended from it), course is the main important class for quiz and lesson if course get destroyed they both get destroyed same thing with quiz and questions , student and analytics,certificate(composition).userService ,quizService and courseService they all need to use JasonDatsBaseMnager (dependency). There are also other relations that are applied as(Assoication) with multiples (lesson to course,course service to admin ,instructor and students and others).In addition to , (Aggregation) applied to Instructor to course as it considered to be part of the course(whole).





### Brief: Class diagram

The class diagram illustrates the main structure of the Skill Forge platform and how its core components interact. It identifies the key classes, their main attributes and methods, and the relationships between them.

At the center of the design is the User class, which represents all types of users on the platform. The Student, Instructor, and Admin classes inherit from the User class, each with their own specific roles and functions. For example, Students can enroll in courses and complete quizzes, Instructors can create and manage courses, while Admins oversee the overall system and manage users.

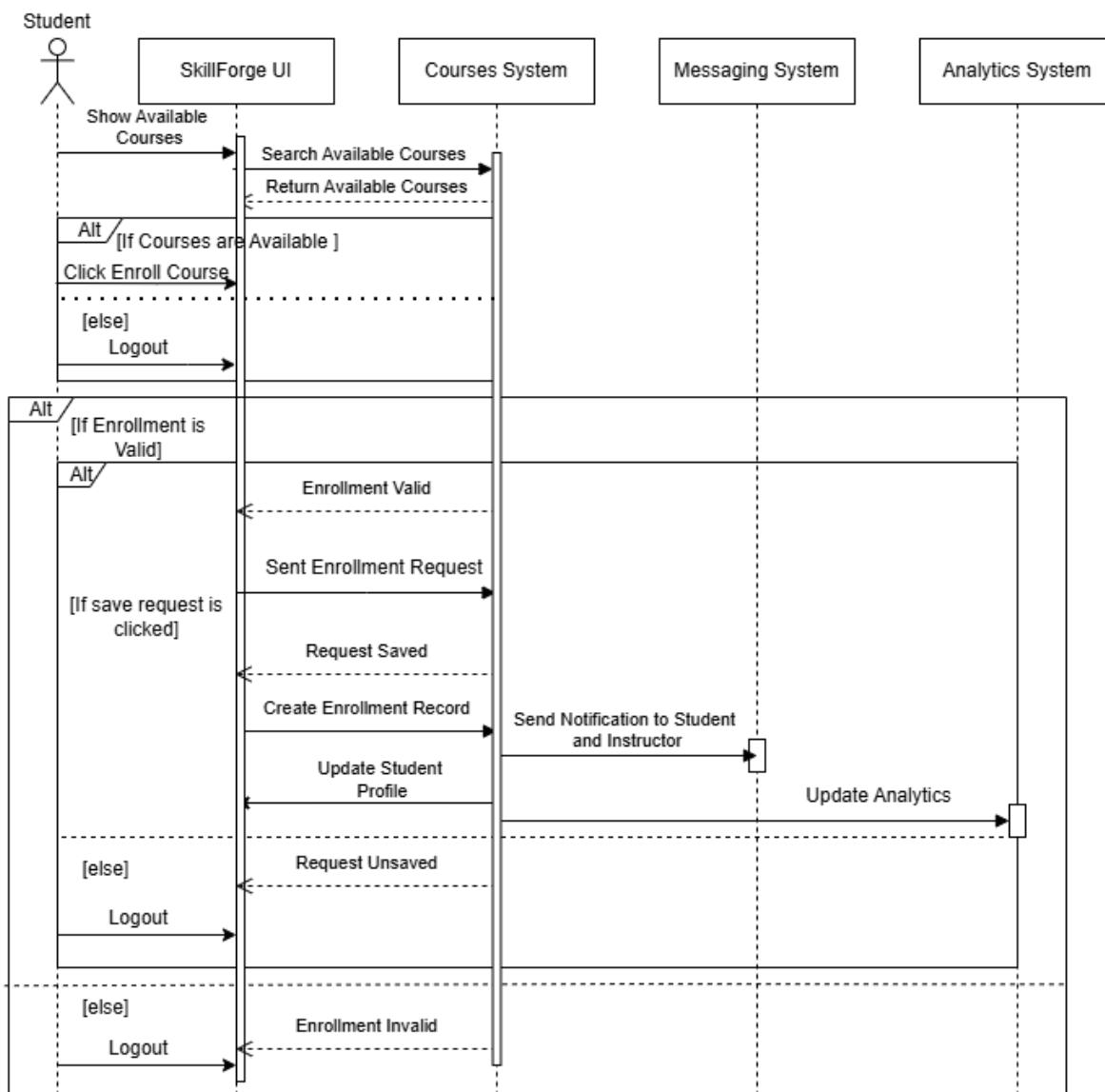
The Course class connects most of the system's features. Each course contains several Lessons and Quizzes, showing aggregation or composition relationships. When a Student completes a course, a Certificate is generated to confirm their achievement.



## Sequence Diagram

### Sequence Diagram

The sequence diagram represents the interaction between different components of the SkillForge system, showing how objects collaborate to complete specific processes. It is important as it helps visualize the system's dynamic behavior and ensures that all components work together efficiently.





### Brief: Sequence Diagram

The Sequence Diagram illustrates how the Student, Courses System, Messaging System, and Analytics System interact over time during the course enrollment process. It shows the sequence of messages exchanged, starting from displaying available courses to validating enrollment, updating records, and sending notifications. This diagram is important because it clearly demonstrates the flow of communication between system components and the timing of each action, ensuring the process is executed in the correct order.