

SkillForge UML Design

Use Case Diagram:

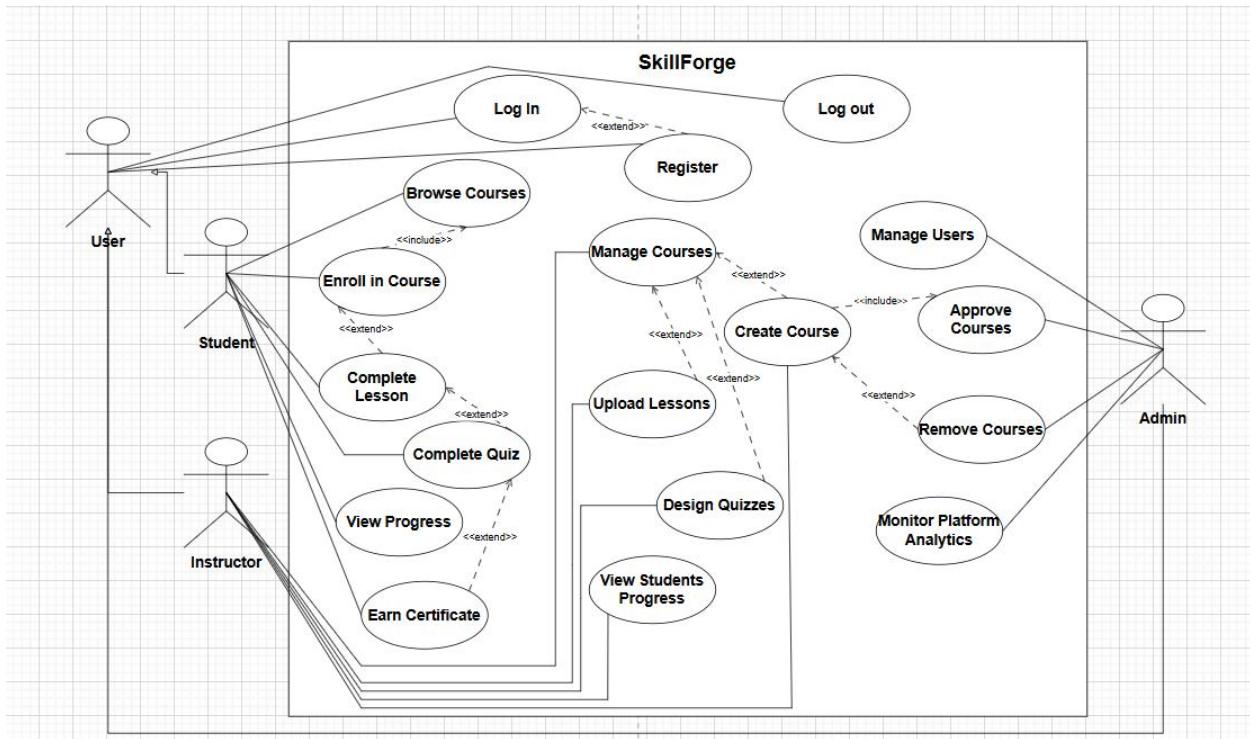


Figure 1: Use Case Diagram for SkillForge Platform

Diagram Description:

The Use Case Diagram illustrates the main functionalities of SkillForge Platform and the main type of users it supports. The diagram is important to understand how each user interacts with system and the relationships between each use case.

Use Cases Description:

1. Log In/Log Out (User): Allow users to access their accounts and exit the platform, where it checks if user exists on the system and loads their data.

2.Register (User): If a user has no account, the platform allows them to register based on the type of user they are.

3.Browse Courses (Student): Allows students to browse available courses and view each course details.

4.Enroll in Course (Student): Allows students to join a course, access lessons and quizzes for this course, where this data is recorded in the system.

5.Complete Lesson (Student): When a student completes a lesson, it records it in the system and updates the student's progress.

6.Complete Quiz (Student): Allows students to take a quiz and test their understanding of the material, where this data is recorded and contributes to completion of the course.

7.Earn Certificate (Student): Generates a certificate and store it in system in case all lessons and quizzes needed for course work are completed.

8.View Progress (Student): Allows students to track their progress and view their completed course work like lessons and quizzes.

9.Create Course (Instructor): Allows instructors to create a new course, where the new course creation is not completed unless approved by an admin.

10.Manage Courses (Instructor): Allows instructors to update, edit or delete their courses.

11.Upload Lessons (Instructor): Allows instructors to add lessons to their courses.

12.Design Quizzes (Instructor): Allows instructors to design Quizzes for lessons in order to test their students' understanding of the material.

13.View Students Progress (Instructor): Allows instructors to view their students' progress that is recorded in the system that includes completed lessons and quizzes.

14.Manage Users (Admin): Allows admin to add, edit or remove students and instructors.

15.Approve Courses (Admin): When an instructor creates a course, the admin reviews it and approves if it meets the platform criteria.

16.Remove Courses (Admin): Allows admins to remove courses when they become outdated.

17.Monitor Platform Analytics (Admin): Allows admins to review system statistics such as number of users, completed lessons and quizzes.

This activity diagram illustrates how instructors create course for admin approval.

Admins then review the course, approving or rejecting it before it becomes available to students.

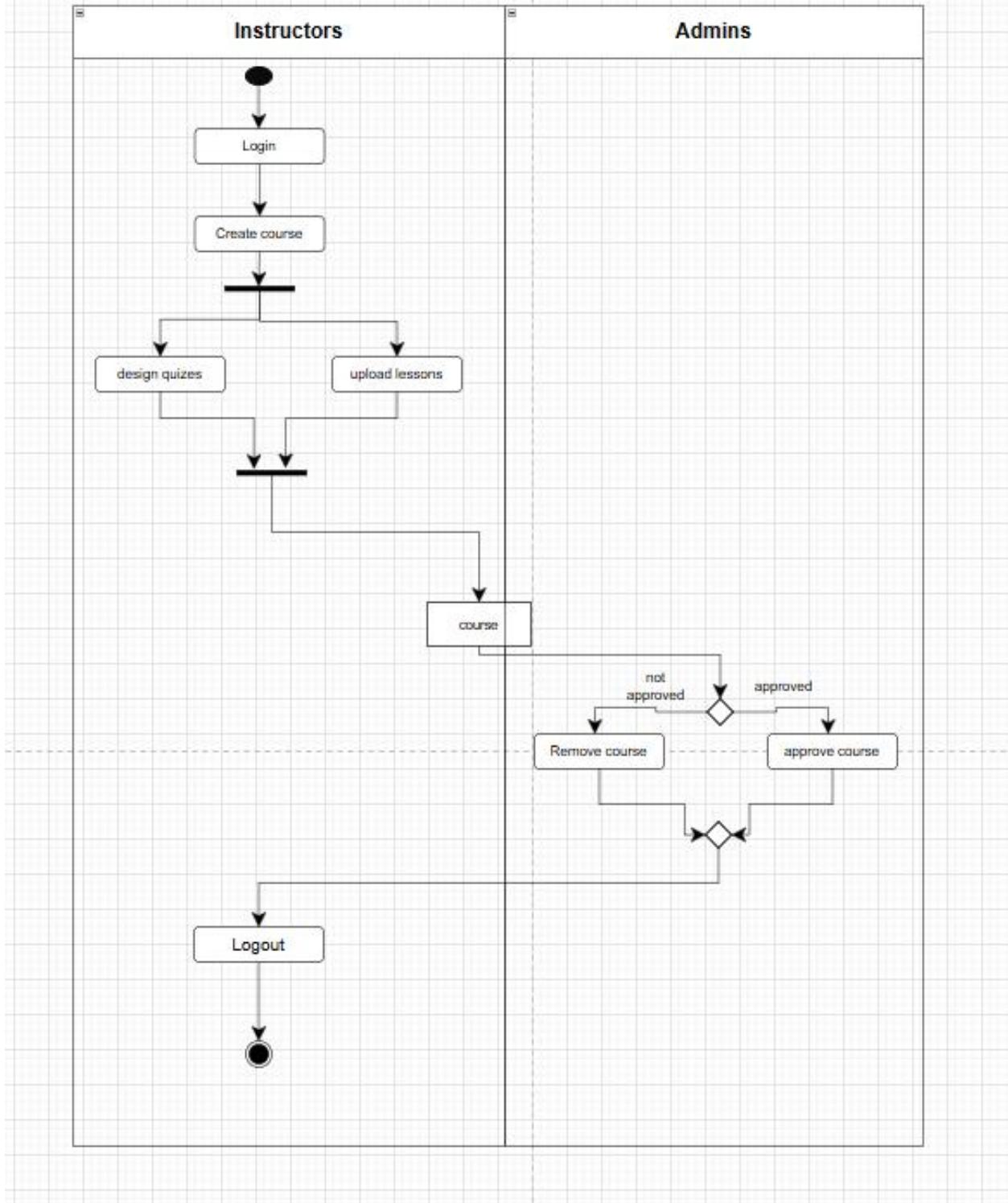


Figure 2: activity Diagram for SkillForge Platform

Class diagram

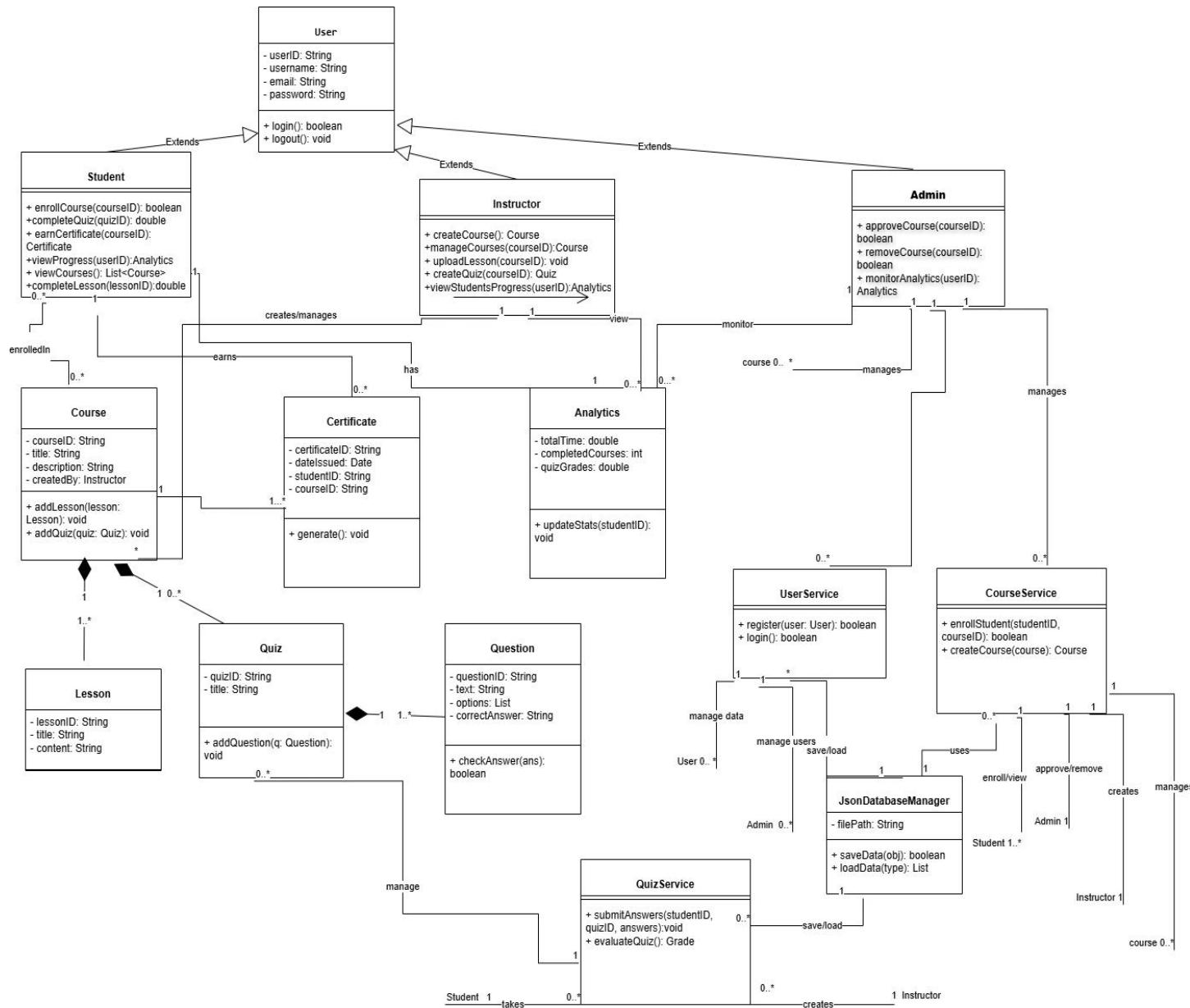


Figure 3: class Diagram for SkillForge Platform

The diagram models the main structure of the SkillForge platform.

- 1) **User** is the parent of **Student**, **Instructor**, and **Admin**, each with specific

roles.

- 2) **Course** is created by an instructor and composed of **Lesson** and **Quiz** objects (composition), while each **Quiz** composed of multiple **Questions**.
- 3) Students enroll in courses, take quizzes, and earn **Certificates**, with progress tracked by **Analytics**.
- 4) Service classes (**UserService**, **CourseService**, **QuizService**) manage system logic

and use a shared **JsonDatabaseManager** for data storage.

Sequence Diagram

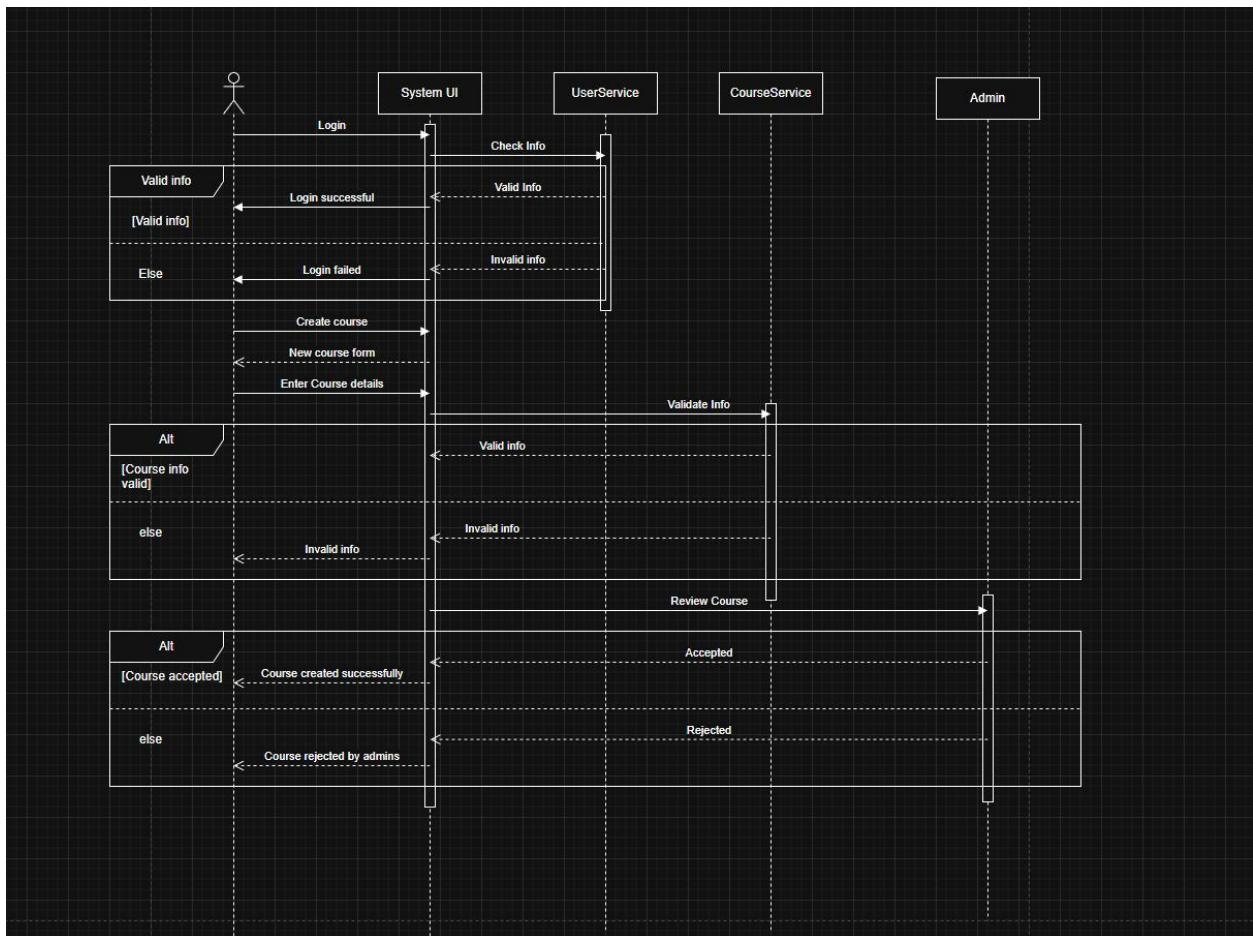


Figure 4: sequence Diagram for SkillForge Platform

This sequence diagram illustrates the “Create a Course” process in the SkillForge platform. It shows how the **Instructor**, **System UI**, **UserService**,

`CourseService`, and `Admin` interact to validate login information, create a course, and approve it. The instructor logs in, and the system checks credentials through the `UserService`. Once logged in, the instructor enters course details, which are validated by the `CourseService`. Finally, the course is reviewed by the `Admin`, who either approves it (course created successfully) or rejects it (course rejected by admins).