D424 – Software Engineering

Task 3

Capstone Proposal Project Name: School Term Tracker

Student Name: Alice Ly

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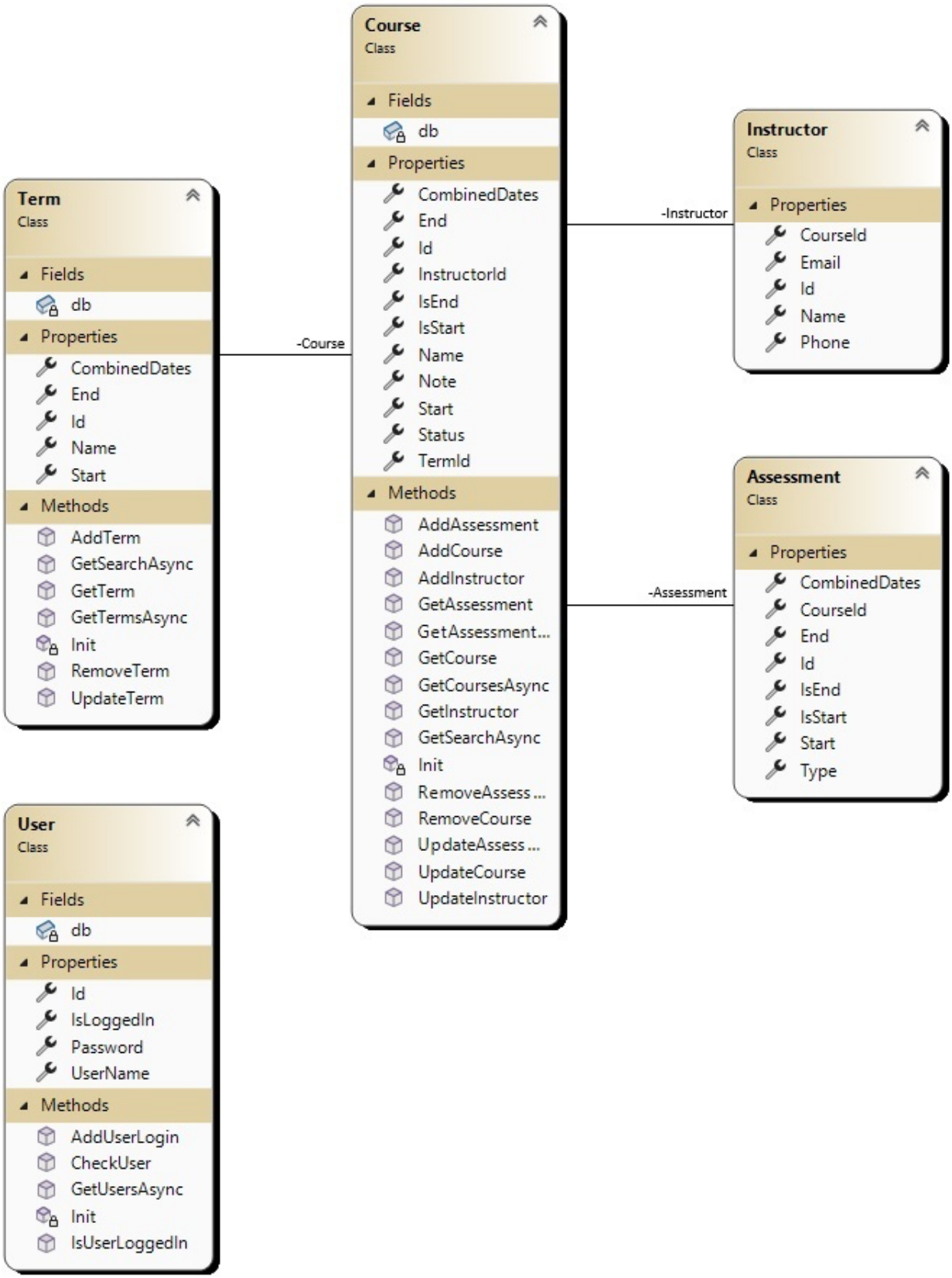
Application Design and Testing

Class Design

A diagram of the components of the School Term Tracker mobile application is provided. The mobile application is a tool for students to track their terms, courses, and assessments and the ability to generate reports. The main classes are as follows:

- Term – The Term class contains all courses related to the term. The class contains methods to add, update, delete, and view terms. Additionally, there is a method to retrieve all terms.
- Course – The Course class contains all courses related to the parent term. A term can contain multiple courses. In addition to adding, updating, and deleting course information, students need to add the course's instructor information as well. Optionally, students can add assessments to courses.
- Instructor – The Instructor class contains information for the course instructor. Instructors can be related to multiple courses.
- Assessment – The Assessment class is related to a course. Each course contains a maximum of two assessments: a Performance Assessment and an Objective Assessment. Students can add, update, and delete assessments.
- User – The User class contains the login information for the student accessing the mobile application. The class contains a method to create a user login if the application does not have any user records, a method to check the validity of the

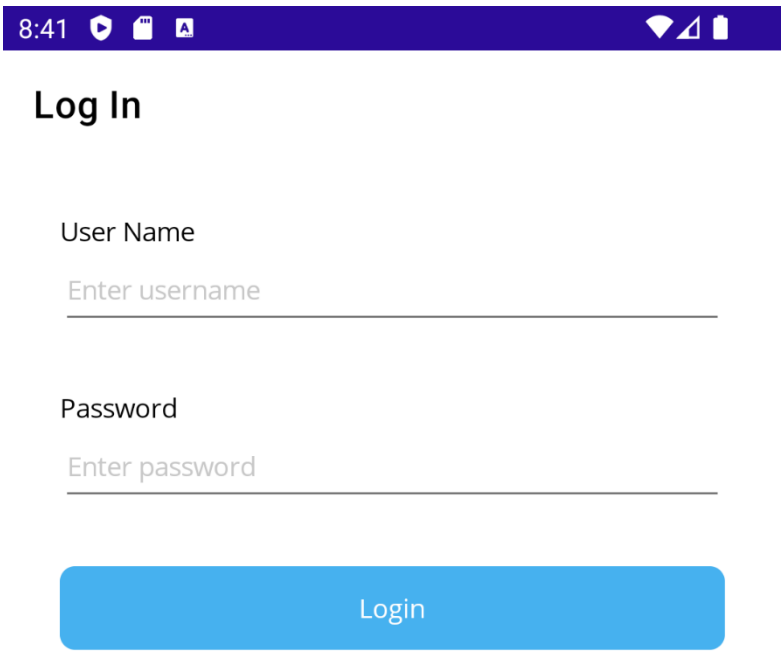
login information, a method to get user records, and a method to check if the user is currently logged in.

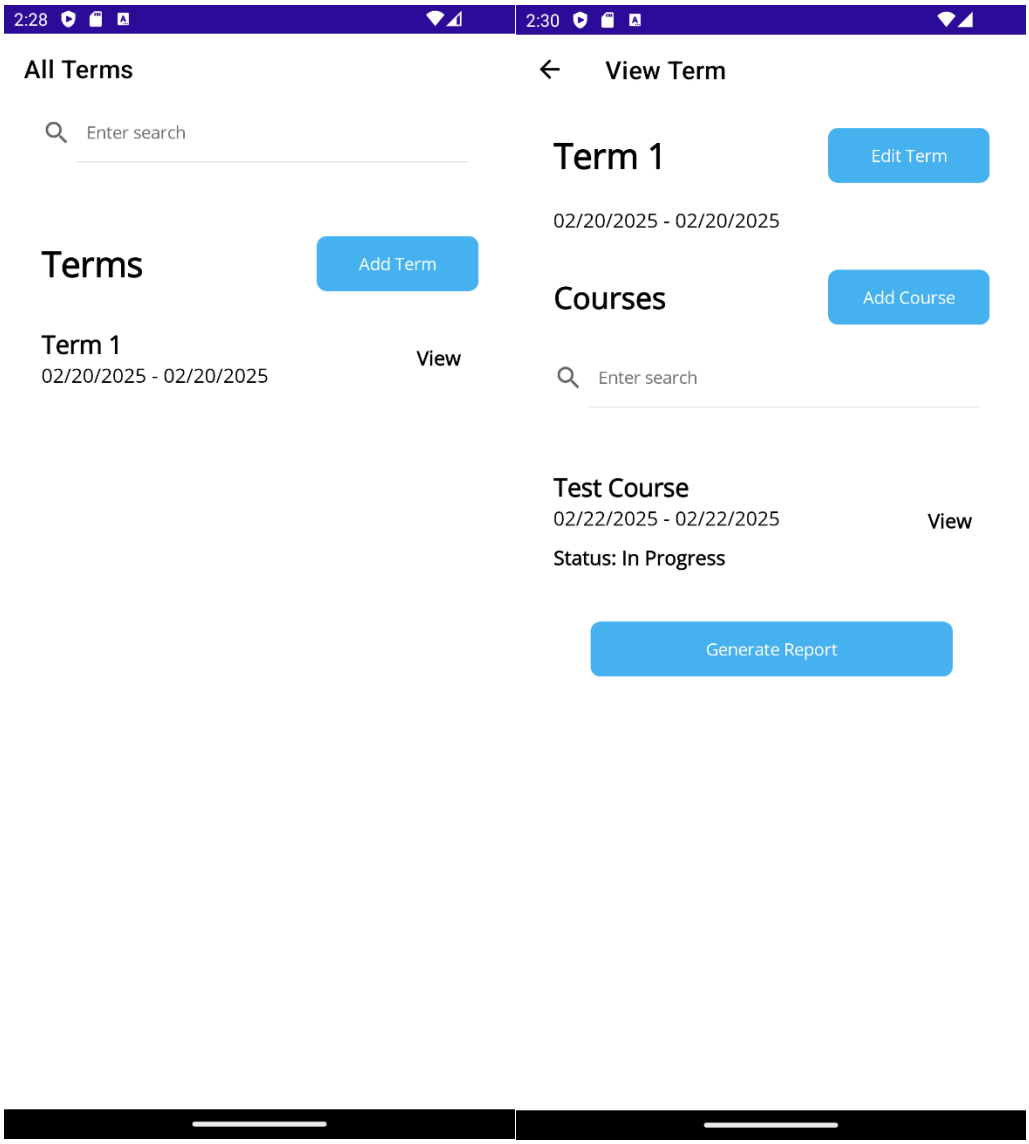

Course
Class
Fields
db
Properties
CombinedDates
End
Id
InstructorId
IsEnd
IsStart
Name
Note
Start
Status
TermId
Methods
AddAssessment
AddCourse
AddInstructor
GetAssessment
GetAssessment...
GetCourse
GetCoursesAsync
GetInstructor
GetSearchAsync
Init
RemoveAssess...
RemoveCourse
UpdateAssess...
UpdateCourse
UpdateInstructor
Term
Class
Fields
db
Properties
CombinedDates
End
Id
Name
Start
Methods
AddTerm
GetSearchAsync
GetTerm
GetTermsAsync
Init
RemoveTerm
UpdateTerm
-Course
Instructor
Class
Properties
CourseId
Email
Id
Name
Phone
-Instructor
Assessment
Class
Properties
CombinedDates
CourseId
End
Id
IsEnd
IsStart
Start
Type
-Assessment
User
Class
Fields
db
Properties
Id
IsLoggedIn
Password
UserName
Methods
AddUserLogin
CheckUser
GetUsersAsync
Init
IsUserLoggedIn

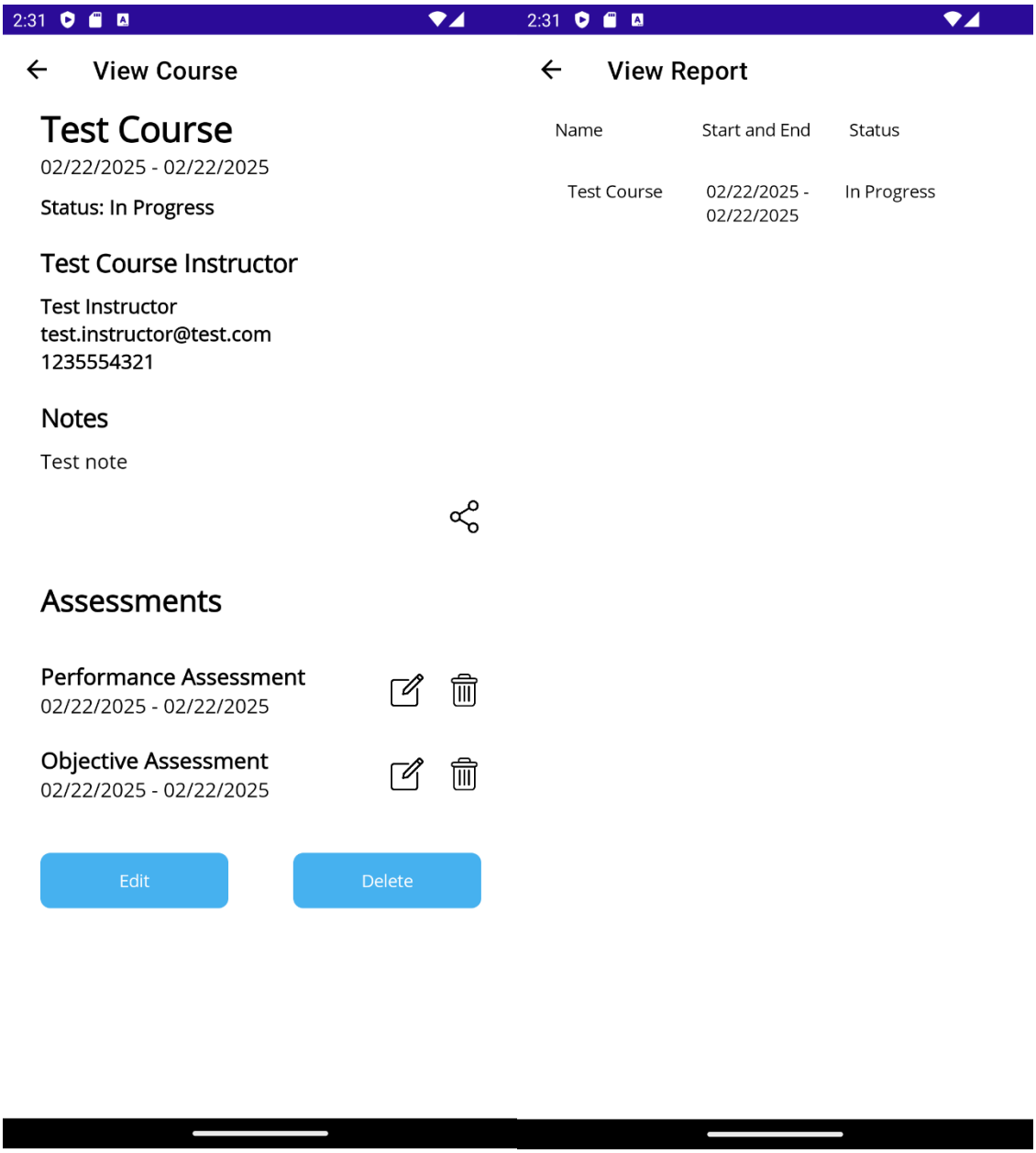
UI Design

The User Interface (UI) for the School Term Track is simple and intuitive so students can focus on their studies. The design starts with a user login screen to securely access the application. Once the user has logged in, users are taken to a screen with a list of terms.

The main feature of the application is for users to add, update, delete, and view their terms, courses, and assessments. Additionally, users can opt to enable notifications for start and end dates for courses and assessments. Users can also generate a report to view a summary of all their courses for a term.




2:28
All Terms
Enter search
Terms
Add Term
Term 1
02/20/2025 - 02/20/2025
View
2:30
View Term
Term 1
Edit Term
02/20/2025 - 02/20/2025
Courses
Add Course
Enter search
Test Course
02/22/2025 - 02/22/2025
View
Status: In Progress
Generate Report


2:31
View Course
Test Course
02/22/2025 - 02/22/2025
Status: In Progress
Test Course Instructor
Test Instructor
test.instructor@test.com
1235554321
Notes
Test note
Assessments
Performance Assessment
02/22/2025 - 02/22/2025
Objective Assessment
02/22/2025 - 02/22/2025
Edit
Delete
2:31
View Report
Name
Start and End
Status
Test Course
02/22/2025 - 02/22/2025
In Progress

Unit Test Plan

Introduction

Purpose

Throughout the development process, it's important to conduct unit tests to ensure the codebase runs smoothly and without issues. The testing method used is to test individual components and ensure the functionality works as intended. This will verify the mobile application performs as expected. For this unit test, we will be testing user authentication.

Overview

User Authentication – The login functionality was tested to ensure that authorized users could access the application. The test involved using valid and invalid credentials to check if the application returns the appropriate response. Valid credentials would take users to the term list screen and invalid credentials would display an error message.

Test Plan

Items

- Development Environment: Unit tests will be conducted in Visual Studio 2022. A new project will be created in the same solution for unit tests.
- Test Framework: The testing framework used will be xUnit, which works with .NET MAUI.

Features

- User Authentication – Test user login.

Deliverables

- Test scripts – A new project will be created in the same solution to hold the test scripts in the codebase.
- Test results – A report with the results of the test scripts, which includes successful and failed tests.

Tasks

- Create a new project in the same solution and use the xUnit framework.
- Write the test scripts for user authentication including adding new user login information, successful authentication, and failed authentication.
- Execute the test scripts.
- Analyze the test results and identify any unexpected results.

Needs

- Software – Visual Studio 2022 needs to be used and xUnit NuGet packages need to be installed.
- Project – Within the solution, create a new xUnit test project for unit testing. Ensure the project references the mobile application project.
- Test scripts – Access the test scripts to run the unit tests.

Pass/Fail Criteria

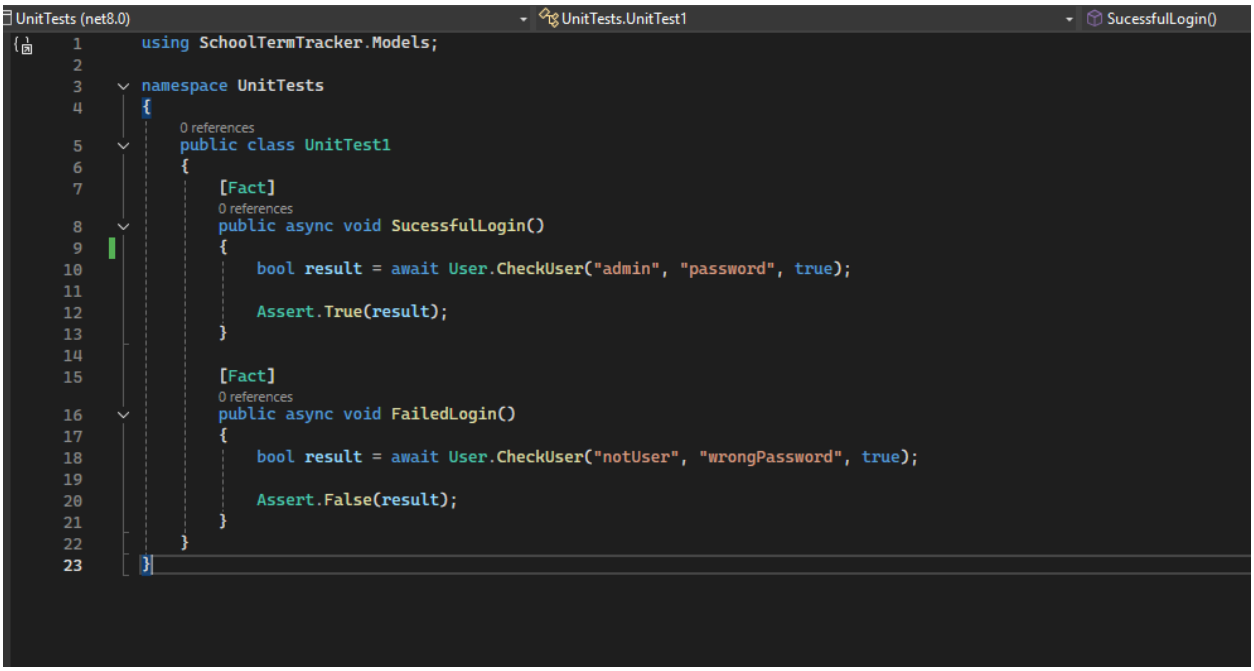
- User Authentication
    - Pass: User login email and password is authenticated and valid.
    - Fail: User login email and password is not authenticated and invalid due to incorrect login information.

If a test failed during the process, the following remediation strategies and documentation requirements were used to address the issue:

- Investigate the failed test to identify the root cause of the issue. This includes examining the output log, error messages, and any other relevant information.
- Document the issue in a bug report or ticket. This will include relevant details such as the test that failed, any error messages, steps to reproduce, and any other relevant details.

Specifications

Below are examples of the test scripts and codes.



Procedures

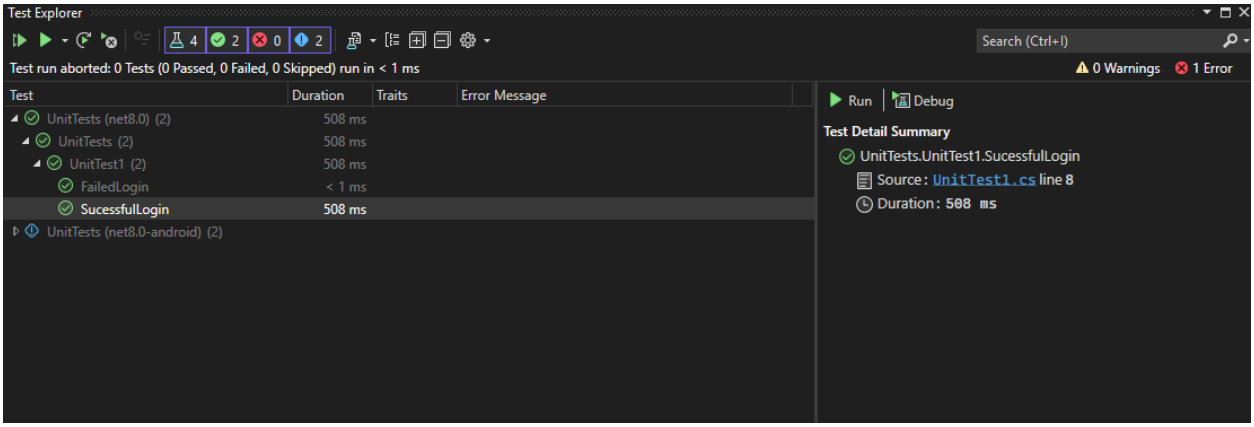
- Determined the functionality of the mobile application that will be tested. Wrote the test cases and defined expected outcomes for each of the test cases.

- Added a new test project to the solution and referenced the project to be tested in the test dependencies.
- Executed the test case using the test runner. If the test cases fail, refine the test cases and code as needed and re-run the test.
- Document the test results, identify any issues and any updates to the code or test cases.

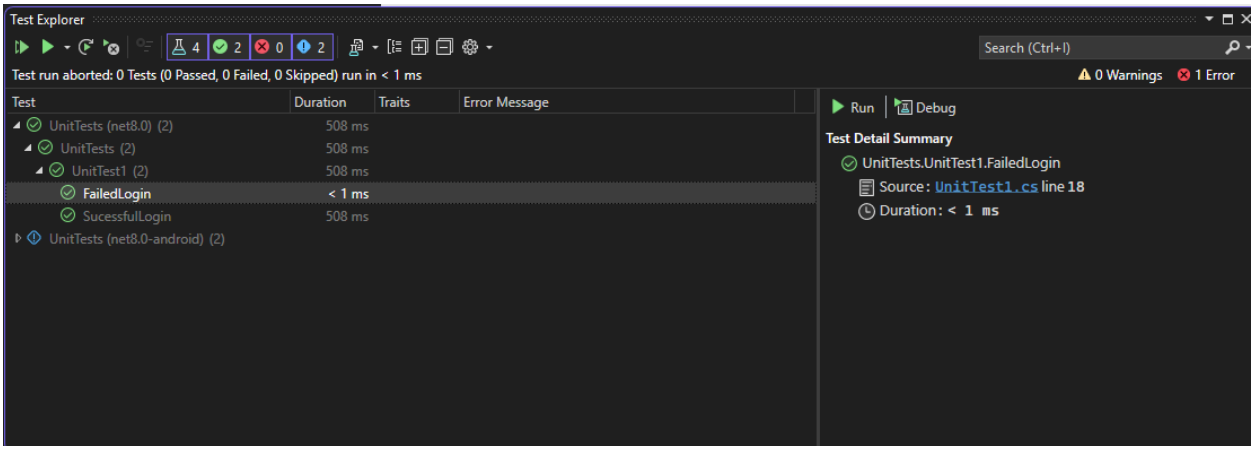
Results

All the tests passed. The results screenshots are as follows.

Successful Login:



Failed Login:



Hosted Mobile Application

Mobile Application Link:

https://play.google.com/apps/test/com.companyname.schooltermtracker/1

GitLab Repository and Branch History

GitLab Repository Link: https://gitlab.com/wgu-gitlab-environment/student-repos/aly25/d424-software-engineering-capstone/-/tree/working

Branch History:

User Guide

Introduction

This User Guide provides an overview of the initial setup and steps to get the application up and running for maintenance.

Installing the Application

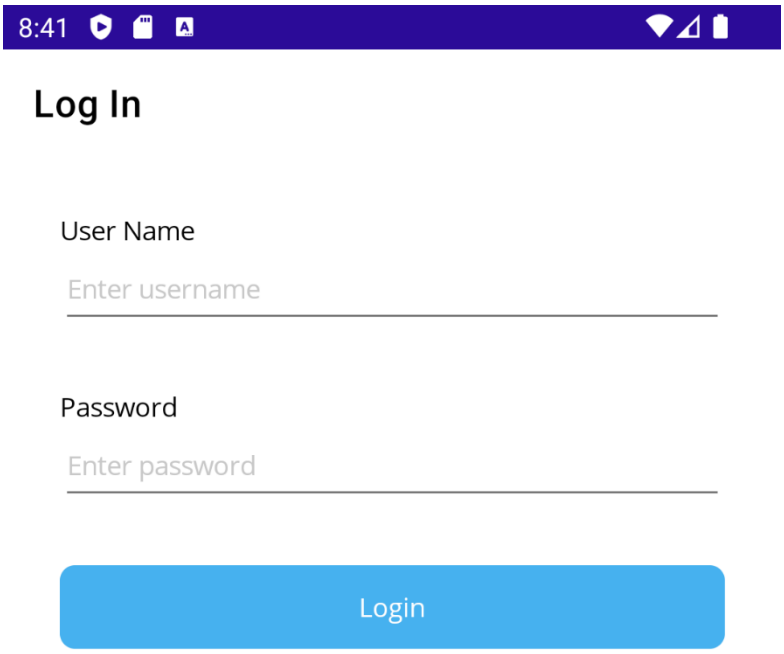
- Ensure Git is installed in your system. Instructions are provided here: https://git-scm.com/book/en/v2/Getting-Started-Installing-Git
- Access the GitLab repository
    - Switch the branch to “working” from “main”
    - Click on the “Code” button and copy the URL under “Clone with HTTPS”
- Open Visual Studio 2022
    - Click “Clone a repository”
    - Paste the URL into the “Repository location” field
    - Confirm the path to the project and click “Clone”
- Build the application and ensure there are no build errors

School Term Tracker User Guide

This User Guide for the School Term Tracker mobile application is an overview of the mobile application’s functionality and features from a user perspective.

User Login

When starting the application, users will use the provided username and password to log into the application. Enter the username and password and click login.

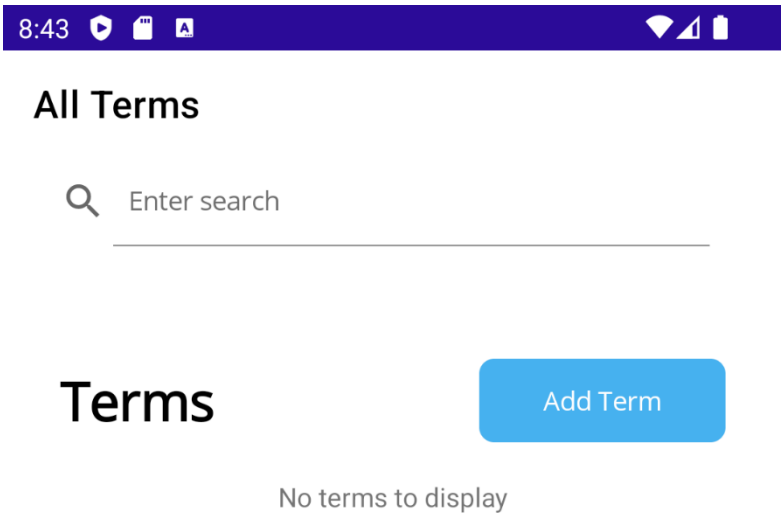


User name: *admin*

Password: *password*

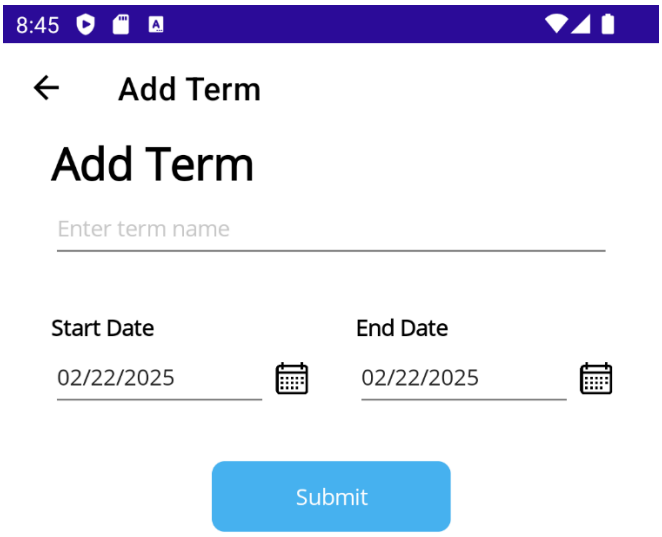
Terms screen

Once logged in you will be directed to the Terms screen.



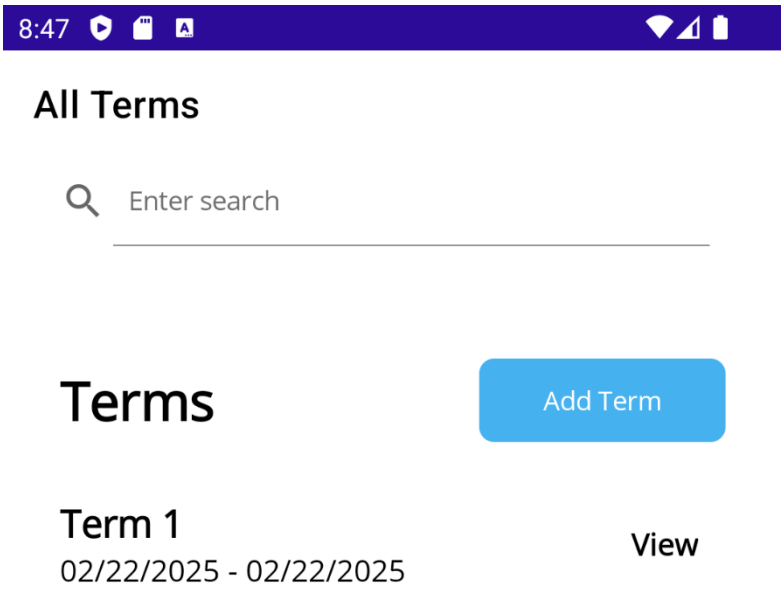
New term screen

Clicking on the “Add Term” button will take you to the new term form. Ensure all fields are complete the start date is before the end date and the end date is after the start date. Click submit when completed.



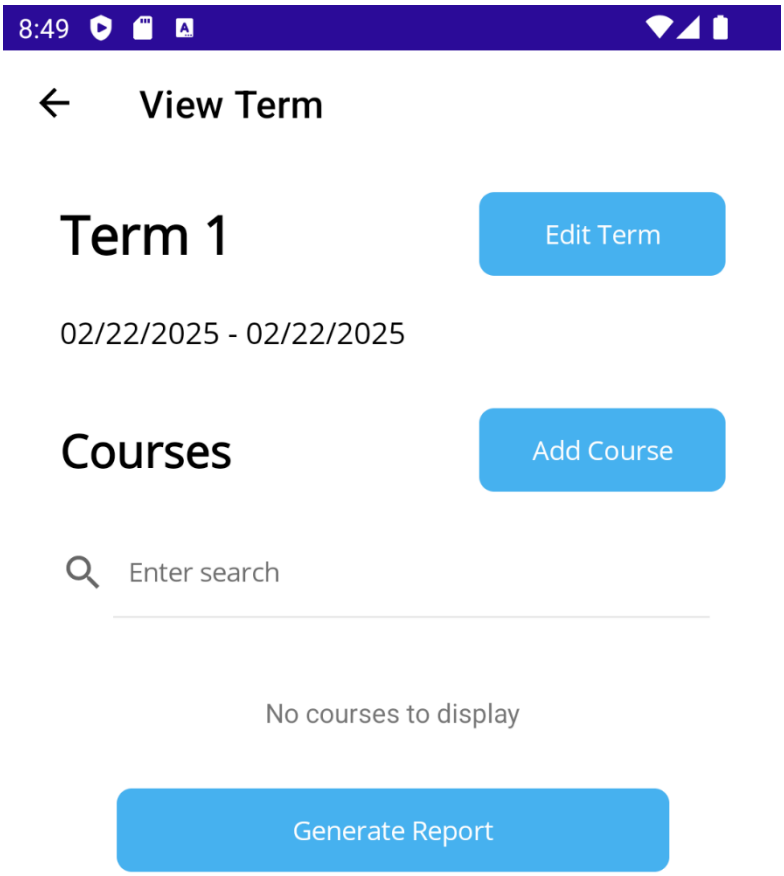
View term

After the creation of a new term, click the “View” link to view the term details.



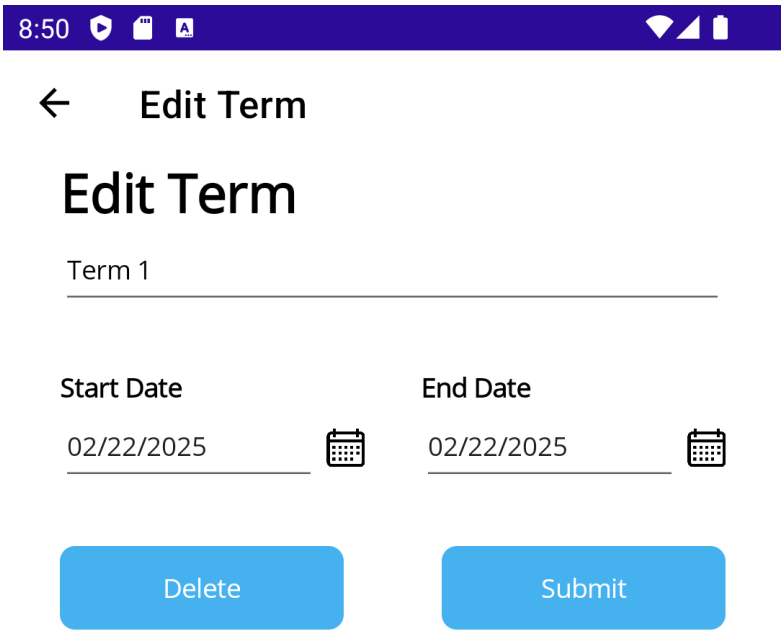
Term details screen

After clicking the “View” link from the terms list screen you will be directed to the term detail screen. You can edit and delete terms and add new courses on this screen.



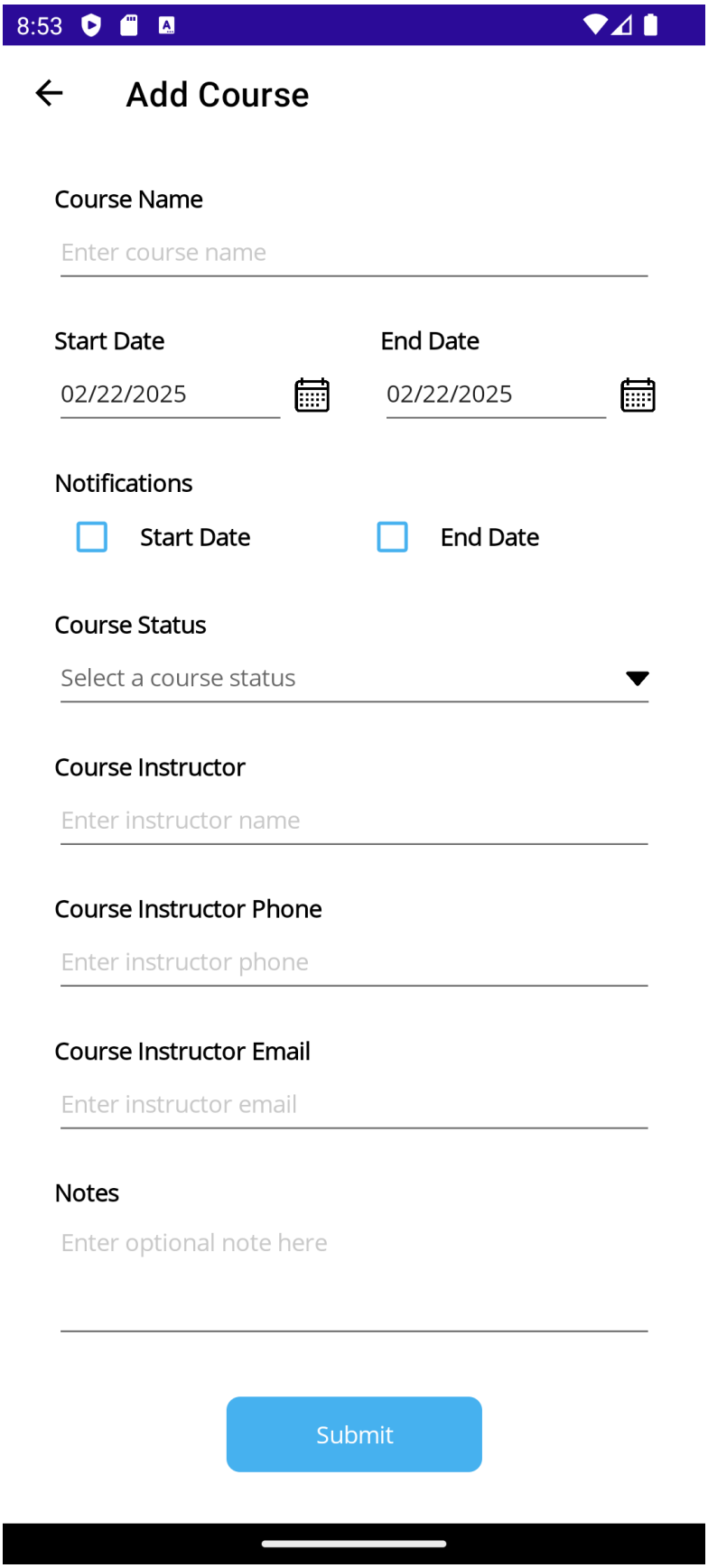
Edit term

To edit the term, click on the “Edit Term” button from the term detail screen. Ensure all fields are complete before clicking submit. Additionally, you can also choose to delete the term by clicking the delete button. Click yes to delete the term or no to cancel the deletion.



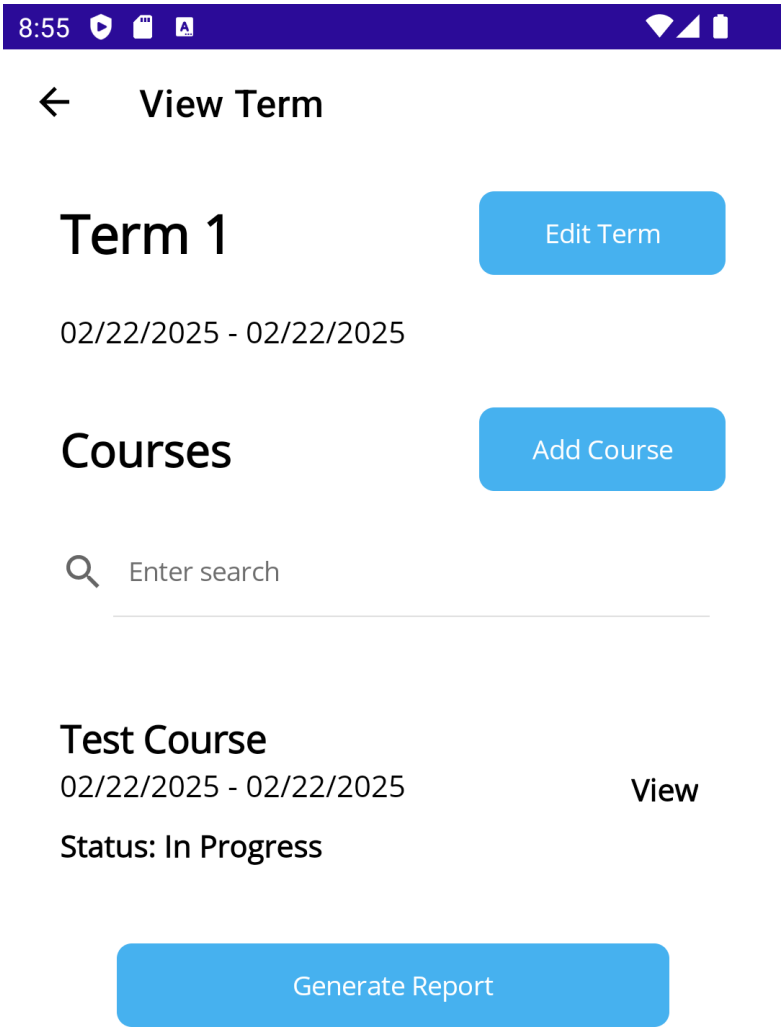
Add course

On the term detail screen, click “Add Course” to add a new course. Ensure completion of all required fields and click submit to add the new course. The notifications and notes field are optional.


8:53
Add Course
Course Name
Enter course name
Start Date
02/22/2025
End Date
02/22/2025
Notifications
Start Date
End Date
Course Status
Select a course status
Course Instructor
Enter instructor name
Course Instructor Phone
Enter instructor phone
Course Instructor Email
Enter instructor email
Notes
Enter optional note here
Submit

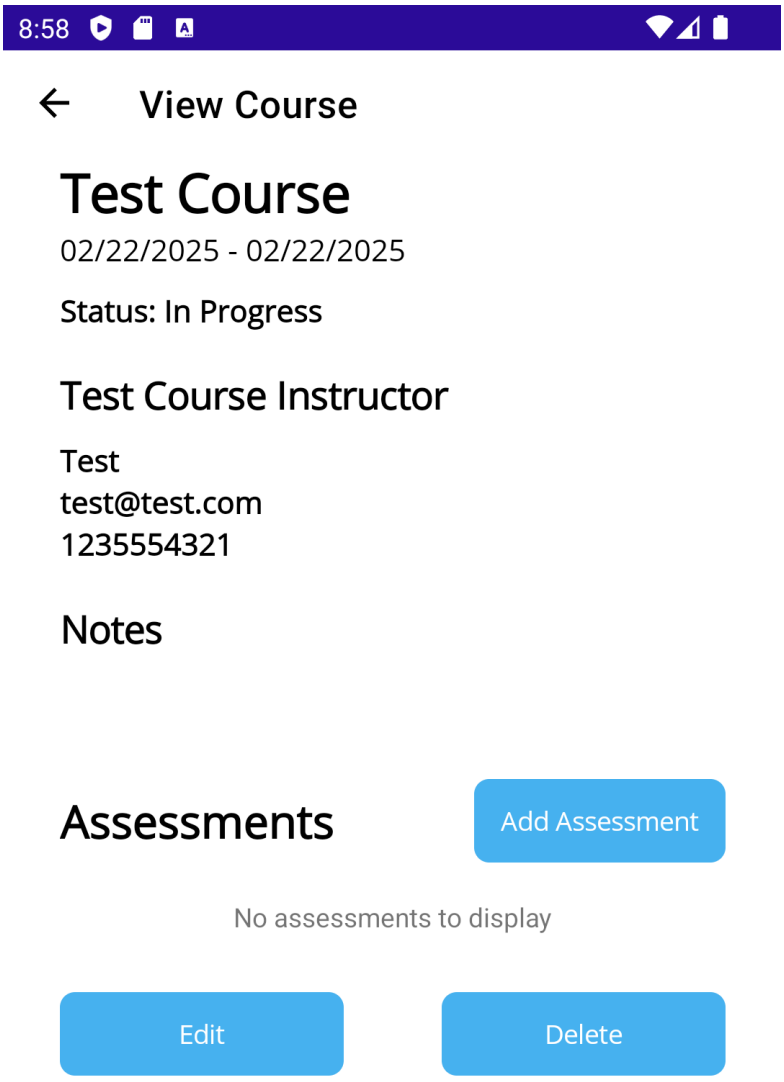
View course

After course creation, click the “View” link to view the course detail screen.



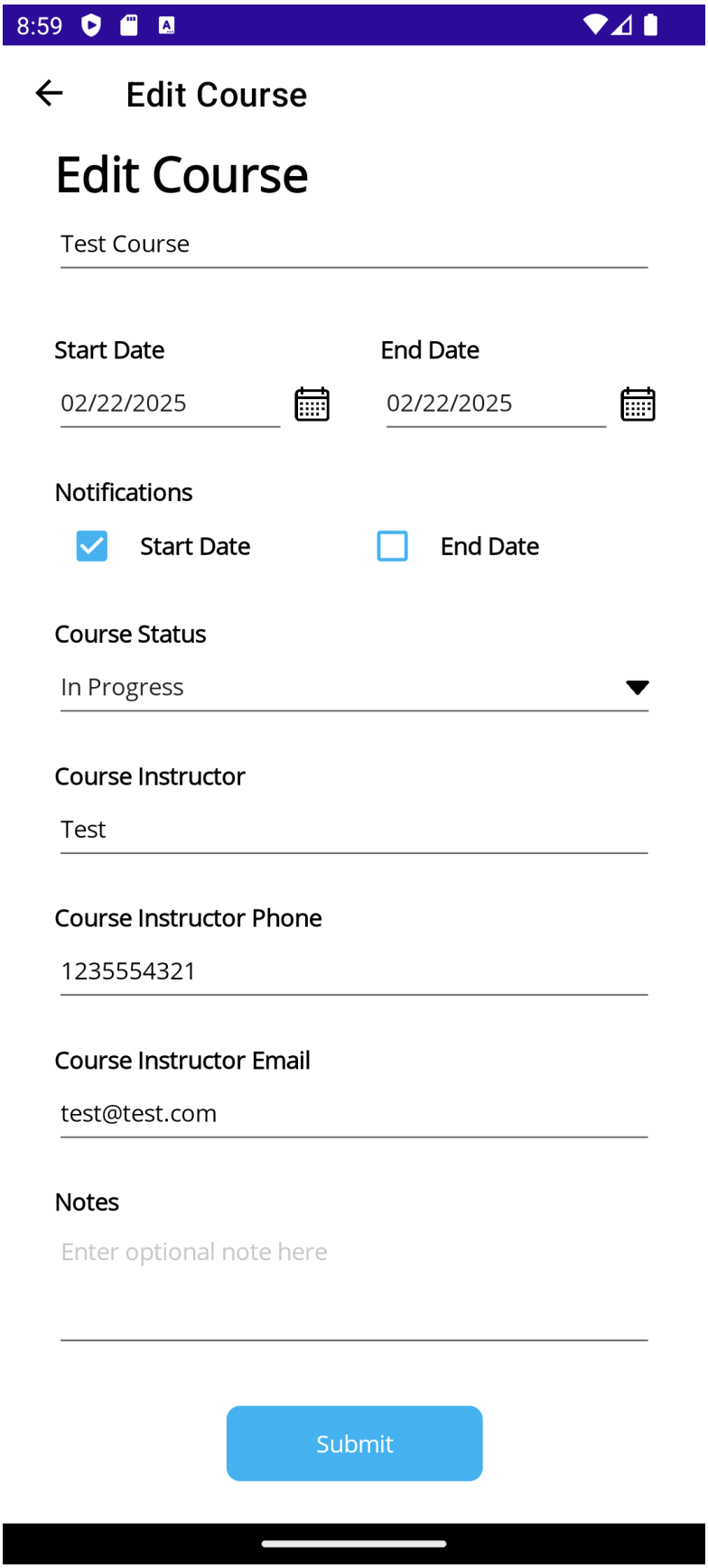
Course detail screen

After clicking the “View” link from the term detail screen, you will be directed to the course detail screen. You can edit the course by clicking the “Edit” button and delete the course by clicking the “Delete” button. You can also add assessments by clicking the “Add Assessment" button.



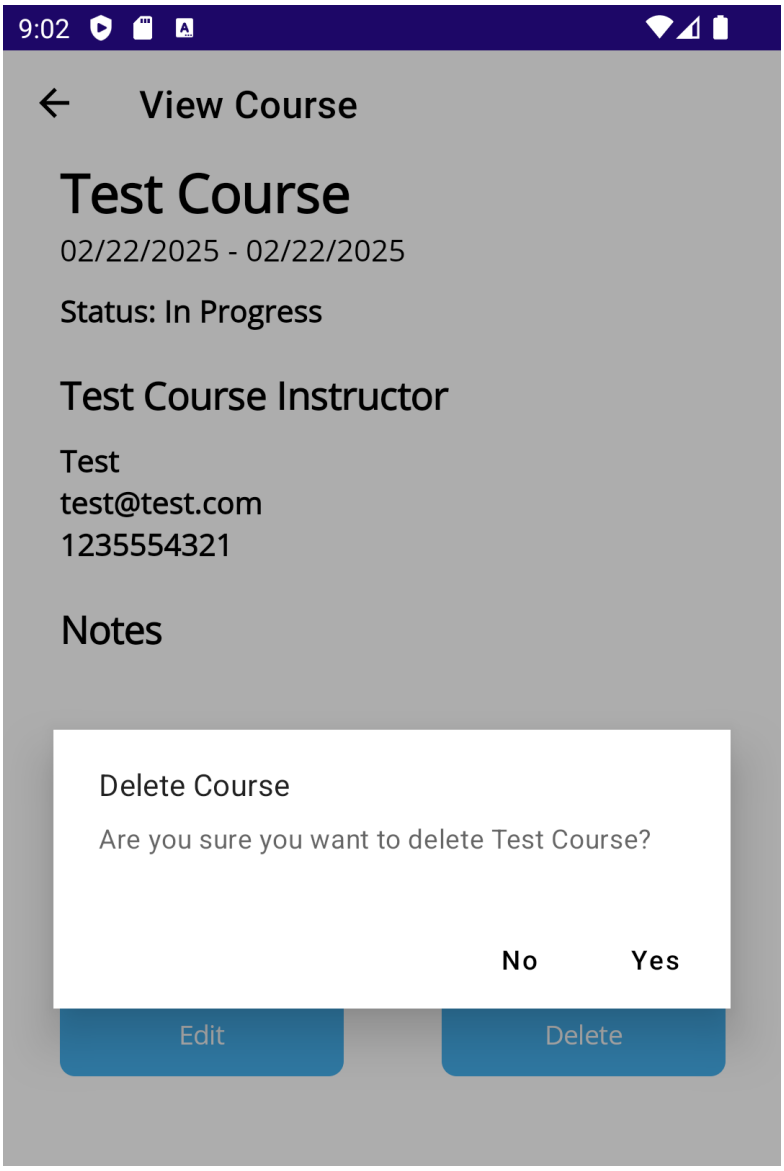
Edit course

To edit the course, click on the “Edit” button from the course detail screen. Ensure all fields are complete before clicking submit.


8:59
Edit Course
Edit Course
Test Course
Start Date
End Date
02/22/2025
02/22/2025
Notifications
Start Date
End Date
Course Status
In Progress
Course Instructor
Test
Course Instructor Phone
1235554321
Course Instructor Email
test@test.com
Notes
Enter optional note here
Submit

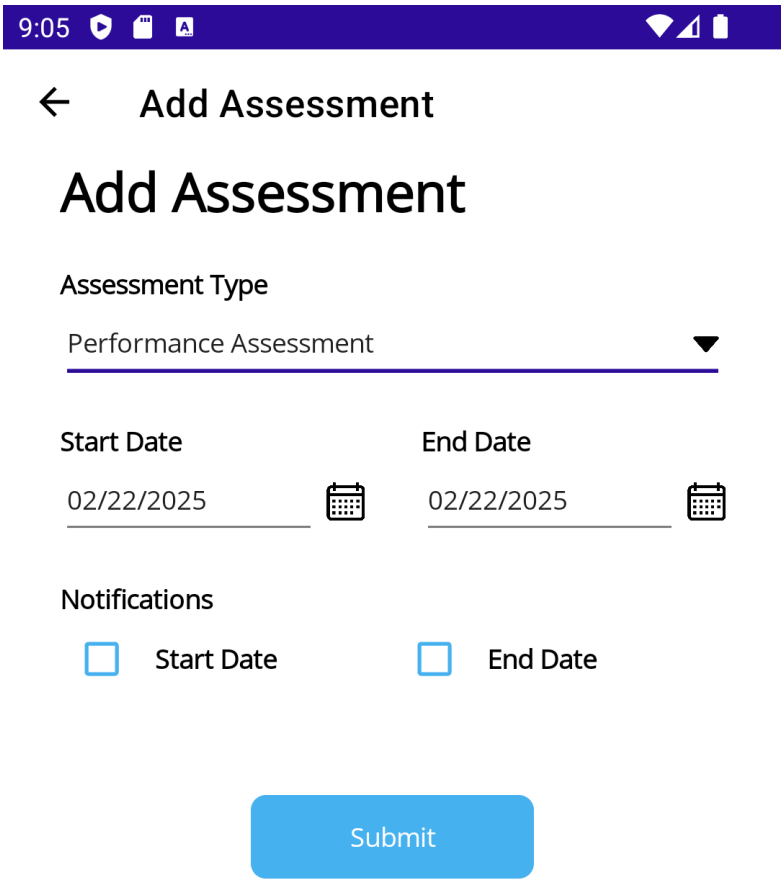
Delete course

On the course detail screen, click the “Delete” button to delete the course. You will be prompted with a pop-up message confirming your decision. Click “Yes” to delete the course or click “No” to cancel deletion.



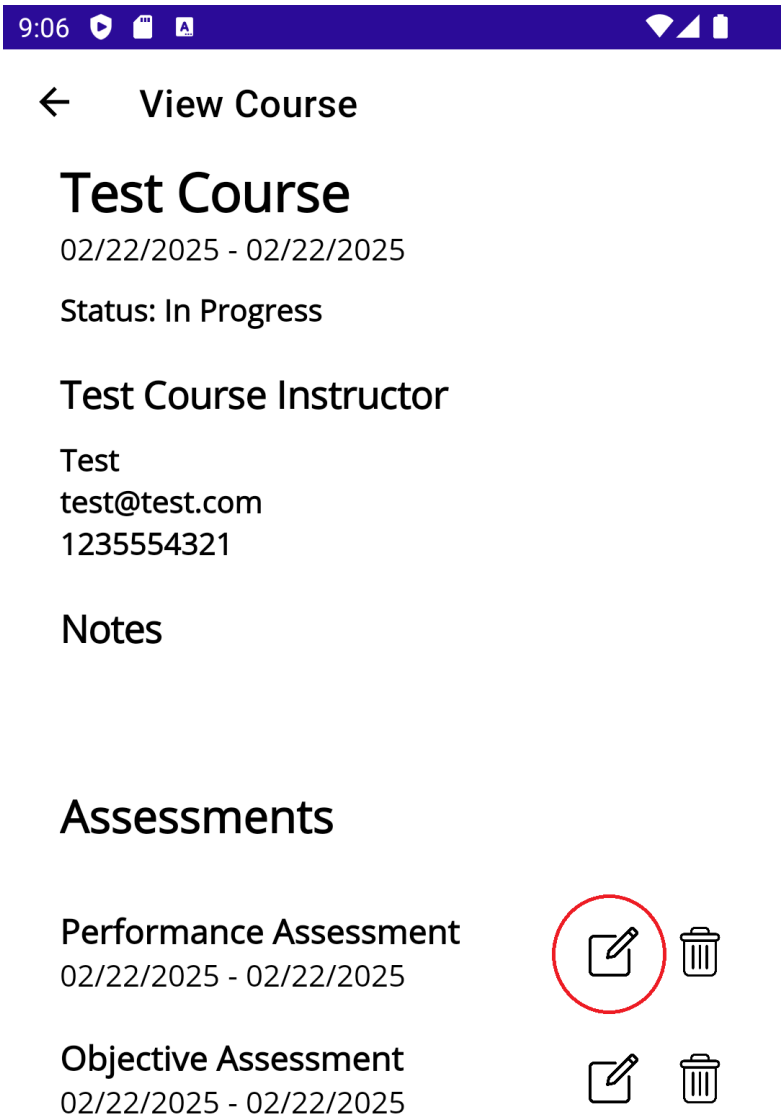
Add assessment

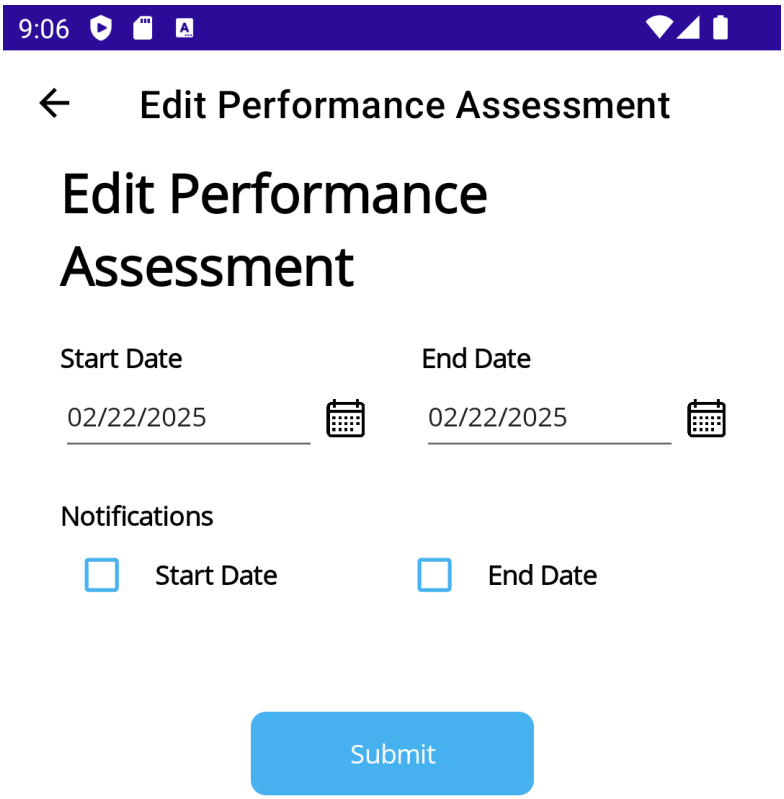
From the course detail screen, you can add a new assessment by clicking the “Add Assessment” button. Enter all required fields and click “Submit” to add the assessment. Notifications are an optional field. There can only be two assessments per course, so if a Performance Assessment exists you can only enter an Objective Assessment.



Edit assessment

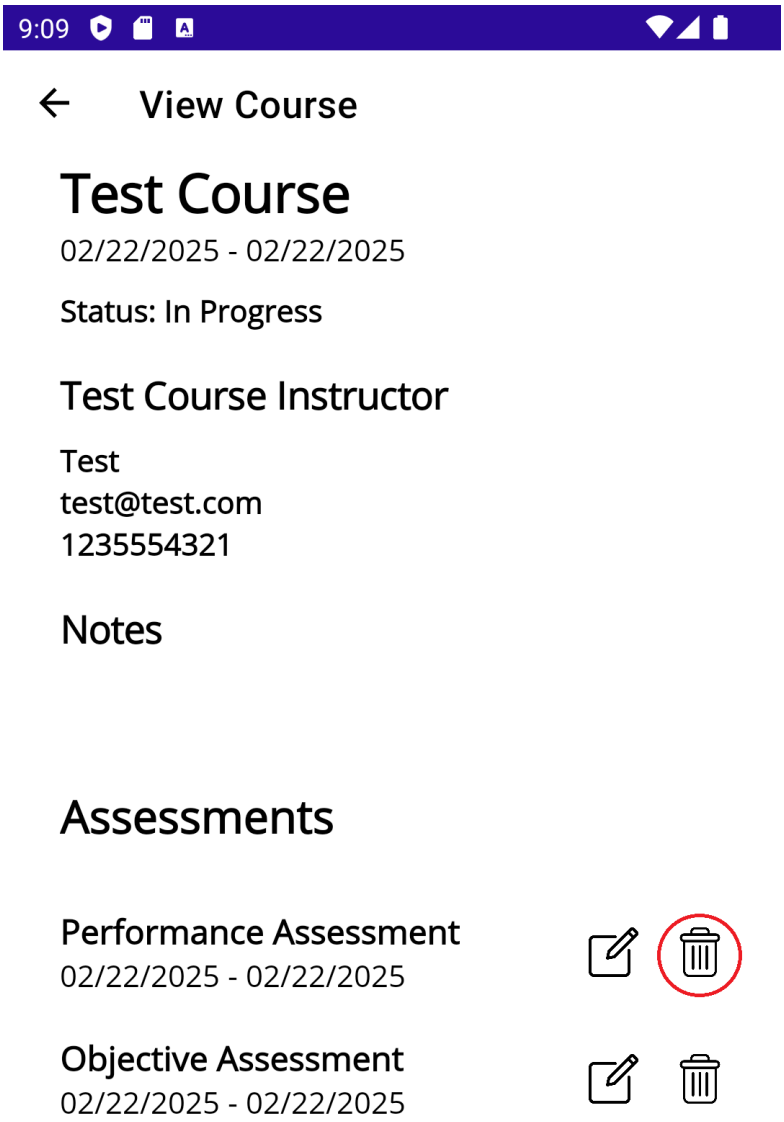
From the course detail screen, click the edit icon next to an assessment to edit the assessment. Ensure the required fields are completed before clicking “Submit”.

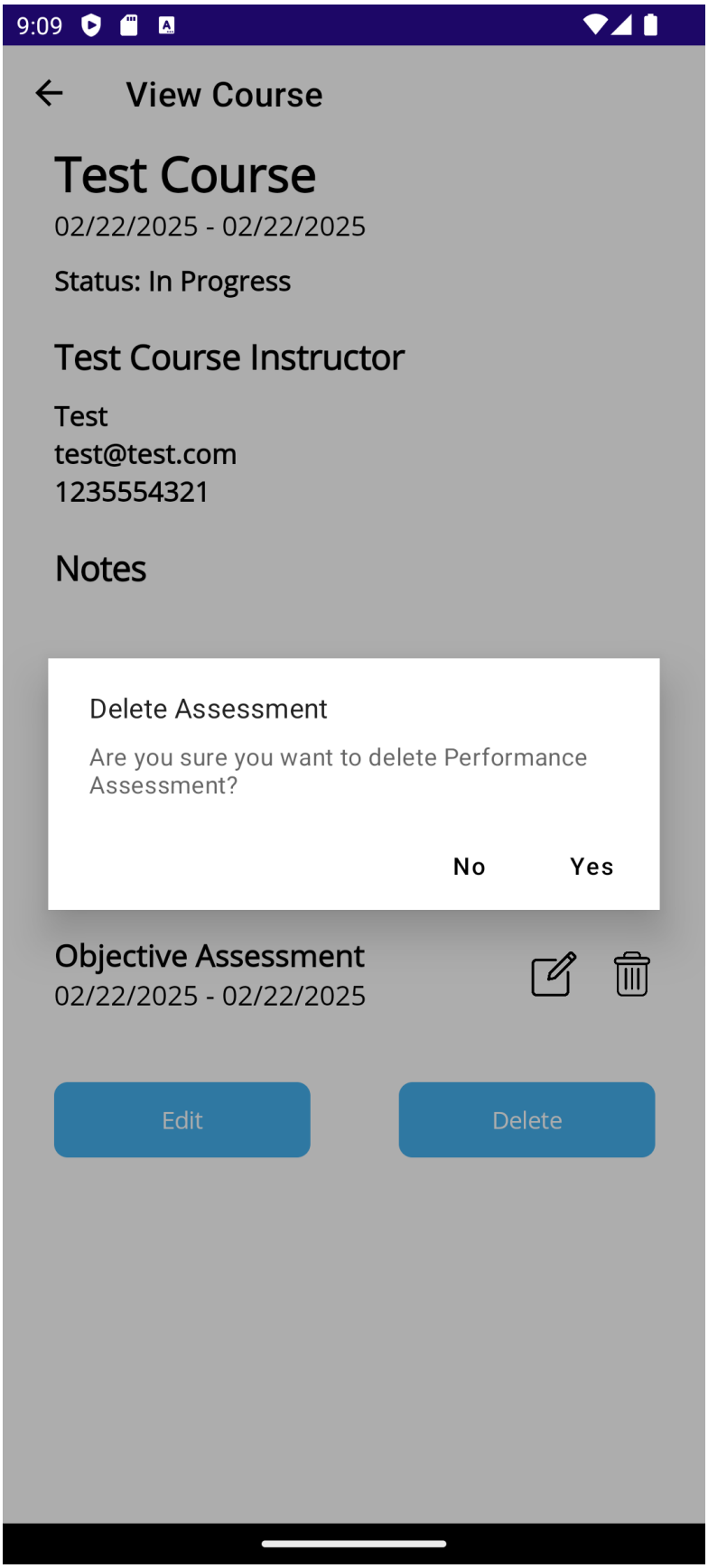

9:06
View Course
Test Course
02/22/2025 - 02/22/2025
Status: In Progress
Test Course Instructor
Test
test@test.com
1235554321
Notes
Assessments
Performance Assessment
02/22/2025 - 02/22/2025
Objective Assessment
02/22/2025 - 02/22/2025



Delete assessment

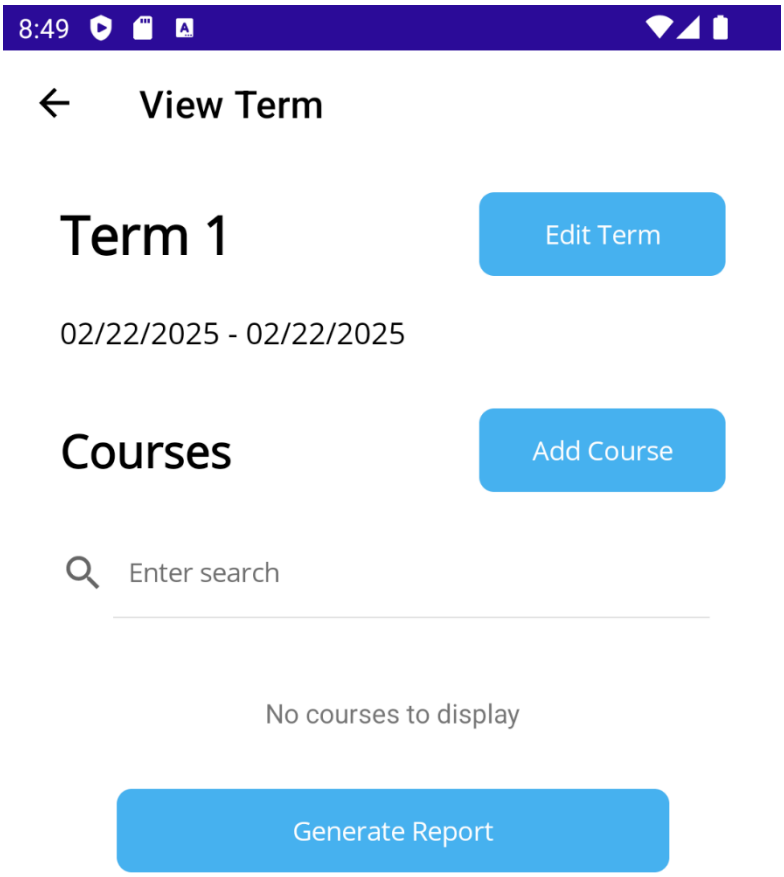
From the course detail screen, click the delete icon next to an assessment to delete the assessment. You will be prompted with a pop-up message confirming your decision. Click “Yes” to delete the assessment or click “No” to cancel deletion.

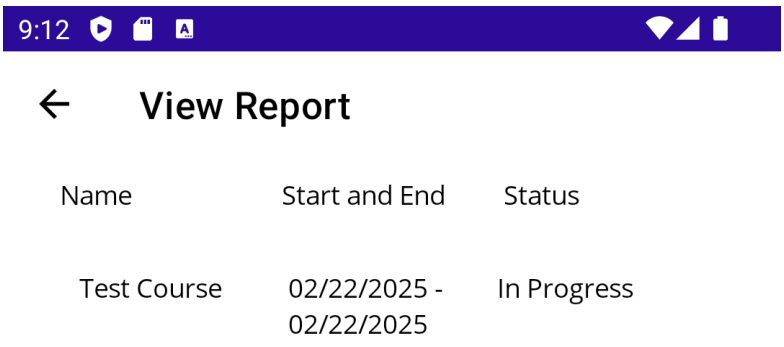

9:09
View Course
Test Course
02/22/2025 - 02/22/2025
Status: In Progress
Test Course Instructor
Test
test@test.com
1235554321
Notes
Assessments
Performance Assessment
02/22/2025 - 02/22/2025
Objective Assessment
02/22/2025 - 02/22/2025


9:09
View Course
Test Course
02/22/2025 - 02/22/2025
Status: In Progress
Test Course Instructor
Test
test@test.com
1235554321
Notes
Delete Assessment
Are you sure you want to delete Performance Assessment?
No
Yes
Objective Assessment
02/22/2025 - 02/22/2025
Edit
Delete

Generate report

From the course detail screen, click the “Generate Report" button to direct to the report screen for the course.





Panopto Video Link

Name: Alice Ly Task 3 D424 Capstone

Link: https://wgu.hosted.panopto.com/Panopto/Pages/Viewer.aspx?id=fee07416-7526-41d2-b8b9-b28e0140e967