Software Requirements Specification
for
Teaching Assistant Management System

Group No. 7

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1 Introduction

1.1 Purpose

The purpose of this web-portal is to facilitate TA allocation and management taking into account both students and professors' preferences.

This document is meant to delineate the features of our product, so as to serve as a guide to the developers on one hand and a software validation document for the prospective client on the other.

1.2 Scope

We describe what features are in the scope of the software and what are not in the scope of the software to be developed.

In Scope:

- Login with Google OAuth for user authentication for students and professors.
- Posting list of courses offered by a professor that require teaching assistants.
- Submitting course constraints (e.g. no. of TAs required, TA eligibility according to department and year) by professors.
- Collecting student information (e.g. grades, CGPA, department rank etc.) and their course preferences.
- Email notification regarding TA allocation results to both students and professors.
- Allocation and tracking of tasks assigned to TAs by course instructor.
- Feedback window for professors to provide feedback for individual Teaching Assistant.
- Issuing TA certificates and compensation upon completion of the course.

Out of Scope:

- Verification of information like grades, CGPA etc. provided by student.

1.3 Definitions, Acronyms and Abbreviations

Definitions:

- Google Sign-In: On some apps, a user can use Google account to sign in the app. In this process, Google APIs (OAuth 2.0 protocol) is used for authentication and authorization.
- Course Constraints: It is the exhaustive list of TA requirements and eligibility constraints specified by the professor for a particular course. For example, no. of TA required, CGPA bar, course prerequisites, student department and year.

Acronyms and Abbreviations

- TA: Teaching Assistant.
- GUI: Graphical User Interface.
- SRS: Software Requirements Specification.

1.4 Overview

The rest of this SRS is organized as follows:

- **Section 2** gives an overall description of the software.
- **Section 3** gives specific requirements which the software is expected to deliver. Functional requirements are given by various use cases.
- **Section 4** gives some possible future extensions of the system.
- **Section 5** describe the user screens.

2 Overall Description

2.1 Product perspective

This product allows both students and professors to find an optimal course-TA allocation according to the given constraints. This product is intended to be a web application designed to run in a browser environment. So, it should run on all modern browsers making it accessible on all sorts of platforms..

2.2 Product Functions

Following table gives an overall view of all the use cases:

Class of use case	**Use case**	**Description of use case**
Use cases related to user roles	Choose profile as student or professor	Redirect to appropriate Login-in page
Use cases related to authorization	Login	Login into the website
	Logout	Logout from website
Use cases related to student profile	Create Profile	Students can create their profiles and add basic information
	Update Profile	Students can update their profile
	View Profile	Students can view their profile
Use cases related to course record	Add course	Professors can add courses offered by them along with their details
	View courses	Professors can view the details of their courses
	Update course details	Professors can update details of their courses including their TA requirements
Use cases related to student TA preferences	Create Preferences	Students can create their course preferences
	Update preferences	Students can update their preferences
	View preferences	Students can view their preferences
Use cases related to TA allocation	TA Allocation and Notification	Portal will run a automated algorithm for TA allocation and inform the users about the results via a email
Use cases related to task/activity allocation	Add new task	Professors can add and assign new activities for TAs such as evaluation/teaching
	View existing activities	Professors can view the activities assigned to TAs
	Edit existing activities	Professors can edit the activities assigned to TAs
Use cases related to submission of tasks	Submit	TAs can add comments, attach necessary files and submit.
	Update tasks	TAs can update their submission according to professor
Use cases related to feedback	Submit feedback	Professors can submit feedback for TAs upon course completion.
Use cases regarding incentive distribution	Distribution of Certificates/Compensation	Portal will perform the incentive distribution upon course completion

2.3 User Characteristics

2.3.1 Student Characteristics

- A student should be a regular enrolled student of IITH with no backlogs.
- A student should be able to give enough time to complete assigned tasks.

2.3.2 Professor Characteristics

- Professors should be offering at least one course in current semester.
- Professor should specify a good approximation of the TA requirement and their eligibility constraints.

2.4 Principal Actors

There are three principal actors in this management system: Students, Professors and System Admin.

2.4.1 General Constraints

- For complete functionality, the portal requires internet connection
- Browser used should be relatively modern and updated.

2.4.2 Assumptions and Dependencies

- Login system depends on Google Authentication.
- Information provided by a student while creating a profile is assumed to be correct and verified.

3 Specific Requirements

3.1 Functional Requirements

We describe the functional requirements by giving various use cases.

3.1.1 Use cases regarding roles

Use Case 1: Choose profile as student or professor
Primary Actor: User
Pre Conditions: Internet connectivity
Main Scenario:

- Visit the website.
- The user is prompted to choose a profile from professor and student.
- User chooses a profile.
- The user is taken to the login portal of the desired profile.

Alternate Scenario:

1. Network error. An error page is shown.

3.1.2 Use cases related to authorization

Use Case 2: Student Login
Primary Actor: Student
Pre Conditions: Internet connectivity, Valid College email account
Main Scenario:

- Visit the website. User selects the student profile.
- User prompted to login through the college email account. Google login screen is displayed.
- User is redirected to the student profile page.

Alternate Scenario:

1. Authorization failed due to invalid email.
2. Prompt the user to login through google again. Google login screen is displayed.
3. Network error. An error page is shown.

Use Case 3: Professor Login
Primary Actor: Professor
Pre Conditions: Internet connectivity, Valid College email account
Main Scenario:

- Visit the website. User selects the professor profile.
- User prompted to login through the college email account. Google login screen is displayed.
- User is redirected to the professor profile page.

Alternate Scenario:

1. Authorization failed due to invalid email.

2. Prompt the user to login through google again. Google login screen is displayed.
3. Network error. An error page is shown.

Use Case 4: User Logout
Primary Actor: General User
Pre Conditions: Internet connectivity, Valid College email account, User logged in
Main Scenario:

- User is logged in and initiates the log out process via a button click on the navigation bar.
- The user is logged out and redirected to the login page.

Alternate Scenario:

1. Network error. An error page is shown.
2. Token expired or invalidated. User is prompted with a message and redirected back to the portal login page.

3.1.3 Use cases related to student profile

Use Case 5: Creating student profile for first time
Primary Actor: Student
Pre Conditions: Internet connectivity, student user logged in, student record is empty
Main Scenario:

- Student user logs in and is redirected to empty profile.
- Student clicks "Edit" button to start filling the profile.
- Student starts filling basic information like - Name, Department, Roll Number, CGPA etc. and his course history - courses taken, semester, grade obtained, etc.
- The user clicks on save and the profile is saved with a confirmation message.
- Student now can view his full profile.

Alternate Scenario:

1. The entered information is invalid or inconsistent. The user is prompted with a message and redirected back to filling his information.
2. Network error. An error page is shown while the entry is discarded.
3. Token expired or invalidated. User is prompted with a message and redirected back to the portal login page while the entry is discarded.

Use Case 6: Modify profile
Primary Actor: Student
Pre Conditions: Internet connectivity, student user logged in, Student profile is not empty.
Main Scenario:

- Student user logs in and the student profile is not empty.
- Student user clicks "Edit" button in order to start modifying courses. The profile becomes editable. .
- The user now can edit his basic information or course history like modifying their grades or append new courses.

Alternate Scenario:

1. The entered course information is incorrect or inconsistent such as 'course does not exist', 'grade does not exist' and so on. User is prompted with a message and redirected back to updating the course information.
2. Network error. An error page is shown while the changes are discarded.
3. Token expired or invalidated. User is prompted with a message and redirected back to the portal login page while the changes are discarded.

3.1.4 Use cases related to course record

Use Case 7: Add new course
Primary Actor: Professor
Pre Conditions: Internet connectivity, Professor user logged in
Main Scenario:

- The Professor user clicks on "Your courses" in navigation bar which redirects him to webpage where he can view/add new courses.
- The Professor user clicks "Add" button which creates a new course instance.
- Details of courses offered by professor this semester, such as course code, course name, basic description, criteria/constraints for the teaching assistants, current state of allocation can be added in the course instance.
- The Professor user clicks "Save" which saves the course records and displays them.

Alternate Scenario:

1. The course record is currently empty and an empty record will be shown to the user.
2. Network error. An error page is shown.
3. Token expired or invalidated. User is prompted with a message and redirected back to the portal login page.

Use Case 8: Modify a course
Primary Actor: Professor
Pre Conditions: Internet connectivity, Professor user logged in and on "Your courses" page, Course record is not empty.
Main Scenario:

- The Professor user clicks "Edit" button on which ever course instance he wants to edit. This makes that particular instance editable.
- The user is able to modify the information about the course such as basic information about the course, professors teaching the course, criteria for teaching assistants and so on.
- The user clicks on "Save" to save his course records after which they are displayed.

Alternate Scenario:

1. Network error. An error page is shown while the changes are discarded.
2. Token expired or invalidated. User is prompted with a message and redirected back to the portal login page while the changes are discarded.

3.1.5 Use cases related to student TA preferences

Use Case 9: Submit a TA response
Primary Actor: Student
Pre Conditions: Internet connectivity, Student user logged in, TA preference page is open
Main Scenario:

- Student user logs in and clicks "TA Preferences" button in navigation bar which redirects the user to preference collection page which is open for the current academic segment.
- The Student user can see the list of all the courses offered this semester for which he/she is eligible as Teaching Assistant.
- The student may select multiple courses by clicking toggle button - "Apply", specific to each course. They can also select "Apply All" to apply for all courses he/she is eligible for.
- The student can also move the preferences of courses by using "Up" and "Down" buttons in the interface.
- The student user clicks "Save" and his preferences are saved with a confirmation message. After saving, all his/her preferences are displayed.

Alternate Scenario:

1. The list of eligible courses is empty. The student is prompted with a message and displayed an empty list.
2. Network error. An error page is shown while the entry is discarded.
3. Token expired or invalidated. User is prompted with a message and redirected back to the portal login page while the entry is discarded.

Use Case 10: Modify TA preferences
Primary Actor: Student
Pre Conditions: Internet connectivity, Student user logged in, TA response form is open
Main Scenario:

- Student user logs in and clicks "TA Preferences" button in navigation bar which redirects the user to preference collection page which is open for the current academic segment.
- The user clicks "Edit" button which makes the page edit-table.
- The user can edit their preferences using toggle - "Apply/Not Apply" button and "Up/Down" buttons.
- The student user clicks "Save" and his preferences are saved with a confirmation message. After saving, all his/her preferences are displayed.

Alternate Scenario:

1. Network error. An error page is shown while the changes are discarded.
2. Token expired or invalidated. User is prompted with a message and redirected back to the portal login page while the changes are discarded.

Use Case 11: Display TA preferences
Primary Actor: Student
Pre Conditions: Internet connectivity, Student user logged in
Main Scenario:

- The user initiates the Display TA responses command via a button click.

- The user is redirected to a page having their TA wish list in the order of their preferences. The status of their selection is also shown.

Alternate Scenario:

1. The record is empty. The user is prompted with a message and shown an empty record.
2. Network error. An error page is shown.
3. Token expired or invalidated. User is prompted with a message and redirected back to the portal login page.

3.1.6 Use cases related to TA allocation

Use Case 12: TA Allocation and Notification
Primary Actor: Portal Admin
Pre Conditions: Internet connectivity
Main Scenario:

- After TA response form is closed, Portal runs an automated algorithm to assign TAs.
- After TAs are allocated, corresponding students are notified via mail about their selection status.
- Corresponding professors are notified about the TAs assigned to them.

Alternate Scenario:

1. Network error. The TAs are re-allocated.

3.1.7 Use cases regarding task assignment

Use Case 13: Assign Task
Primary Actor: Professor
Pre Conditions: Internet connectivity, Professor user logged in
Main Scenario:

- The user clicks "Manage Courses" in the navigation bar which redirects it to course management page.
- The Professor user can select which course he/she wants to manage. He/She is redirected to course specific management page.
- In course specific management page, Professor clicks "Add" button which creates a new task assignment instance. Now he/she can assign a checklist of tasks to each TA of that course.
- The Professor clicks "Save" button which notifies the corresponding teaching assistants of their tasks.

Alternate Scenario:

1. Network error. An error page is shown while the entry is discarded.
2. Token expired or invalidated. User is prompted with a message and redirected back to the portal login page while the entry is discarded.

Use Case 14: Modify Assigned Task
Primary Actor: Professor
Pre Conditions: Internet connectivity, Professor user logged in
Main Scenario:

- The user clicks "Manage Courses" in the navigation bar which redirects it to course management page.
- The Professor user can select which course he/she wants to manage. He/She is redirected to course specific management page.
- In course specific management page, Professor clicks "Edit" button on the task assignment instance, he wants to edit which makes it editable.
- He/she can edit/delete tasks assigned to each TA of the course.
- The Professor clicks "Save" button which notifies the corresponding teaching assistants of an update in their tasks.

Alternate Scenario:

1. Network error. An error page is shown while the changes are discarded.
2. Token expired or invalidated. User is prompted with a message and redirected back to the portal login while the changes are discarded.

Use Case 15: View/Submit Assigned Task
Primary Actor: Student
Pre Conditions: Internet connectivity, Student user logged in
Main Scenario:

- The user clicks "My Tasks" in navigation bar and the list of courses for which user is TA is displayed.
- The user clicks course for which he/she wants to view/submit tasks.
- A list of tasks with professor comments is displayed. The user can attach necessary files, add comments and the submit his assigned tasks.

Alternate Scenario:

1. Network error. An error page is shown.
2. Token expired or invalidated. User is prompted with a message and redirected back to the portal login page.

Use Case 16: Modify Submission of Assigned Task
Primary Actor: Student
Pre Conditions: Internet connectivity, Student user logged in
Main Scenario:

- The user clicks "My Tasks" in navigation bar and the list of courses for which user is TA is displayed.
- The user clicks course for which he/she wants to view/submit tasks.
- A list of tasks with professor comments is displayed. The user can attach necessary files, add comments and re-submit his assigned tasks.

Alternate Scenario:

1. Network error. An error page is shown.
2. Token expired or invalidated. User is prompted with a message and redirected back to the portal login page.

Use Case 17: Evaluate Assigned Task
Primary Actor: Professor
Pre Conditions: Internet connectivity, Student user logged in
Main Scenario:

- The user clicks "Manage Courses" in the navigation bar which redirects it to course management page.
- The Professor user can select which course he/she wants to manage. He/She is redirected to course specific management page.
- In course specific management page, Professor clicks "View" button on the task assignment instance, he wants view and edit.
- He/she can see and evaluate the submission done by TA. He/She can also post additional comments for TA to look, in case he is not satisfied with the submission.

Alternate Scenario:

1. Network error. An error page is shown.
2. Token expired or invalidated. User is prompted with a message and redirected back to the portal login page.

3.1.8 Use cases regarding feedback management

Use Case 18: Submit TA feedback
Primary Actor: Professor
Pre Conditions: Internet connectivity, Professor user logged in, Course has completed
Main Scenario:

- The Professor use clicks "Feedback" button in his navigation bar and is redirected to feedback window.
- The user can select the course and TA name and fill in his feedback.
- The user is asked to provide a overall feedback on a scale of 0 to 10.
- After completing the feedback, the Professor user clicks "Submit" to submit feedback.

Alternate Scenario:

1. Network error. An error page is shown.
2. Token expired or invalidated. User is prompted with a message and redirected back to the portal login page.

3.1.9 Use cases regarding incentive distribution

Use Case 19: Distribution of Certificates and Compensation
Primary Actor: System Admin
Pre Conditions: Internet connectivity
Main Scenario:

- Upon semester completion, portal starts a automated process for certificates and compensation distribution.
- The portal distributes TA certificates and compensation to all the TAs with course professor feedback greater than a threshold (like overall feedback $\geq 4/10$).
- TA compensations is also initiated with the help of Account/Academic Section.

- TAs receive their compensation invoice and certificates (via mail).

Alternate Scenario:

1. Network error. Transaction is terminated and re-initiated.

3.2 Performance Requirements

- Should run in an updated web browser environment with enough RAM.
- Displaying list of eligible courses should be arguably fast.
- User-interactions response should be available in less in 2 seconds

3.3 Design Constraints

- **Security**: Email authentication for login and registration of all users.
- **Fault Tolerance**: Data will not get corrupted under any event of hardware failure or system crash.
- **Reliability**: The portal should have a reliability of $\geq 99\%$

3.4 External Interface Requirements

The portal is divided into two parts - for students and professors. The interface first ask the user whether he/she is a student or a professor, and then after successful authentication redirects him/her to corresponding portal.

Both professors and students have a navigation bar, using which they can perform their user-specific functions as mentioned above. They both can also logout from the portal using navigation bar. Students can checkout/edit their profiles by clicking "Your Profile", TA preferences by clicking "TA preferences", assigned tasks by clicking "Your Tasks" options in the navigation bar. Similarly, Professors can use "Edit Profile", "Your Courses", "Manage Courses", "Feedback" options on their navigation bar for checking out/editing their profiles, managing courses, assigning tasks and providing feedback.

4 Future Extensions

- Automated system for verification of student records via official university records (like AIMS database)
- Automated and Integrated system for payments via portal.
- Usage of past student feedback comments for better TA allocation.

5 Appendix

The diagram below shows the outline of the main user screens.

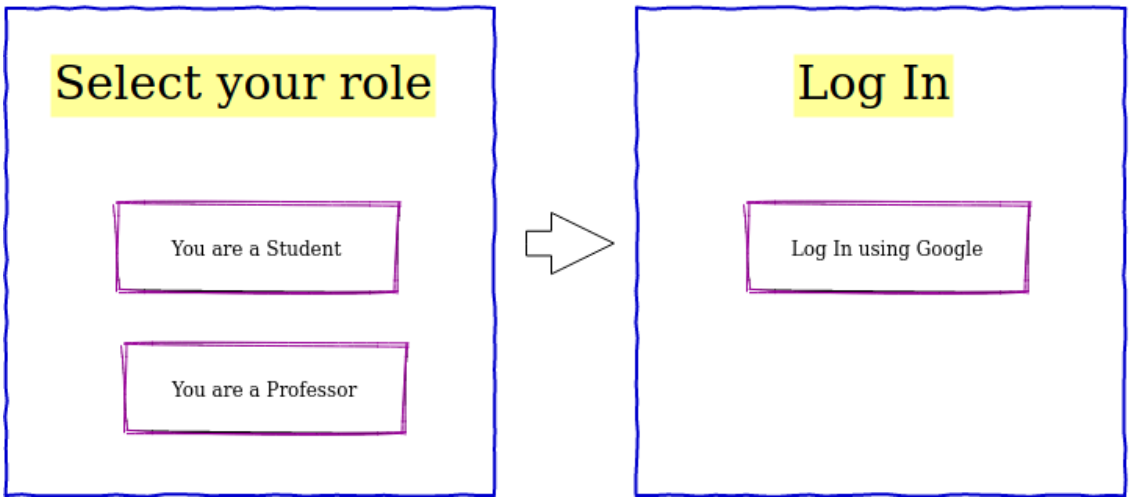

Figure 5.1: User Authorization

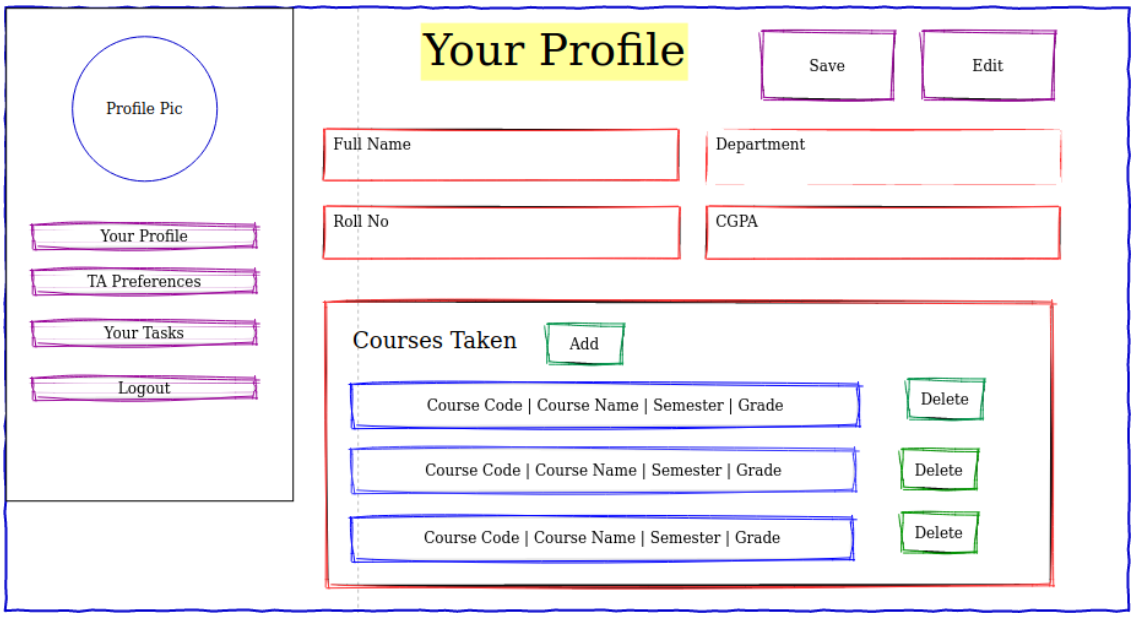

Figure 5.2: Student Profile

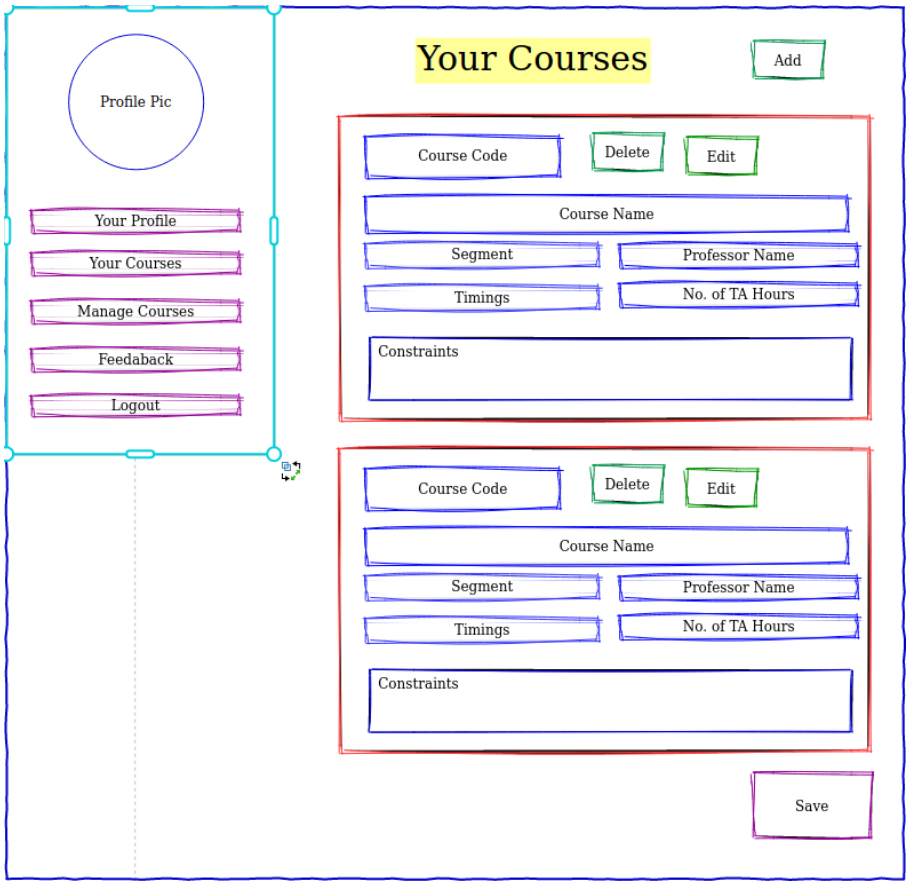

Figure 5.3: Interface for Adding/Viewing/Modifying Course details and requirements

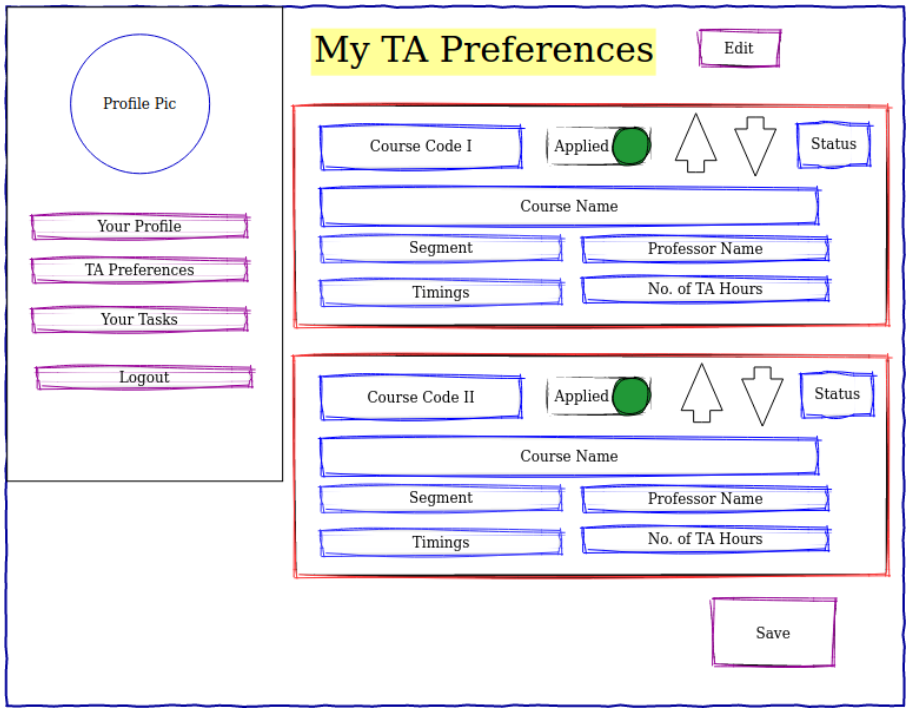

Figure 5.4: Interface for submitting TA preferences

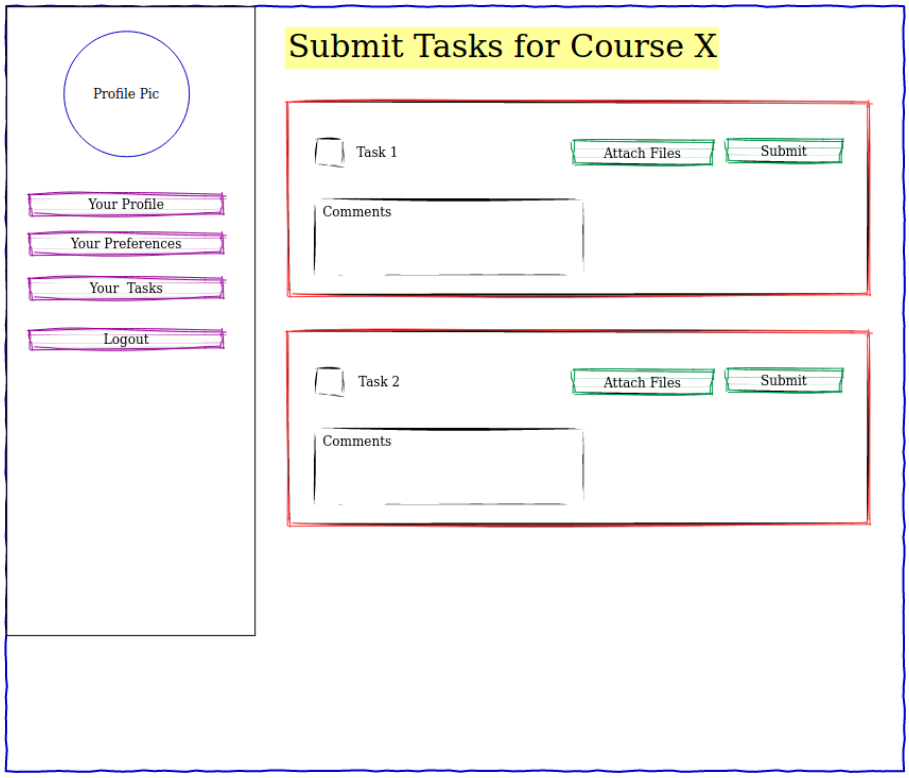

Figure 5.5: Interface for viewing and submitting tasks assigned

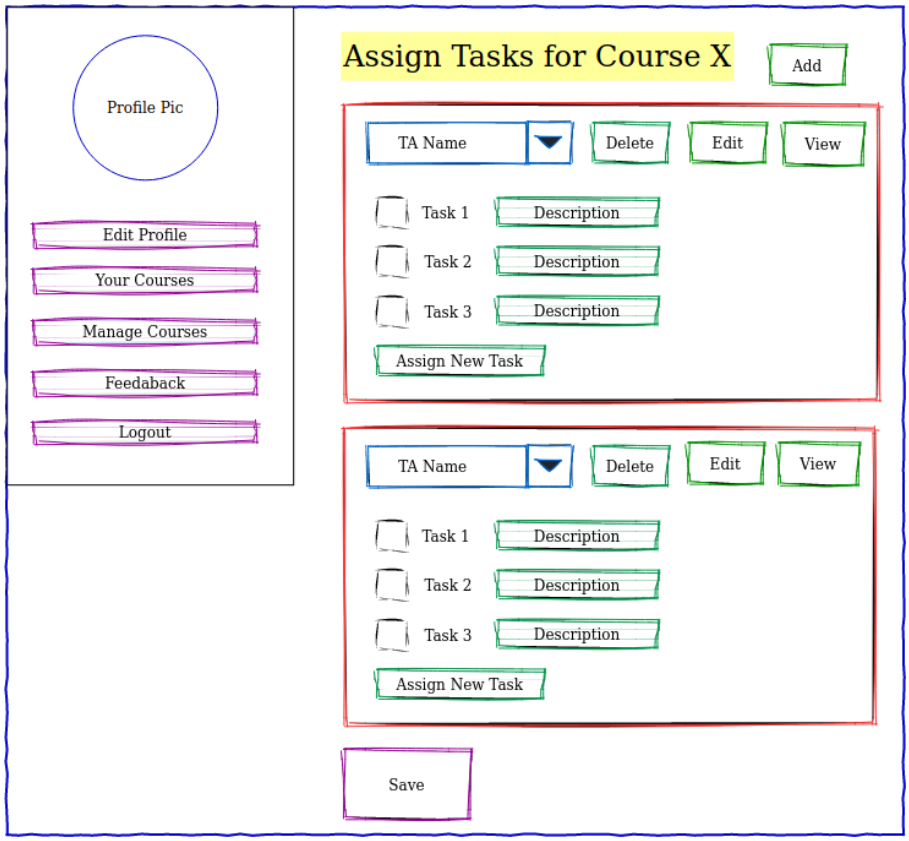

Figure 5.6: Interface for assigning and managing tasks to TAs.

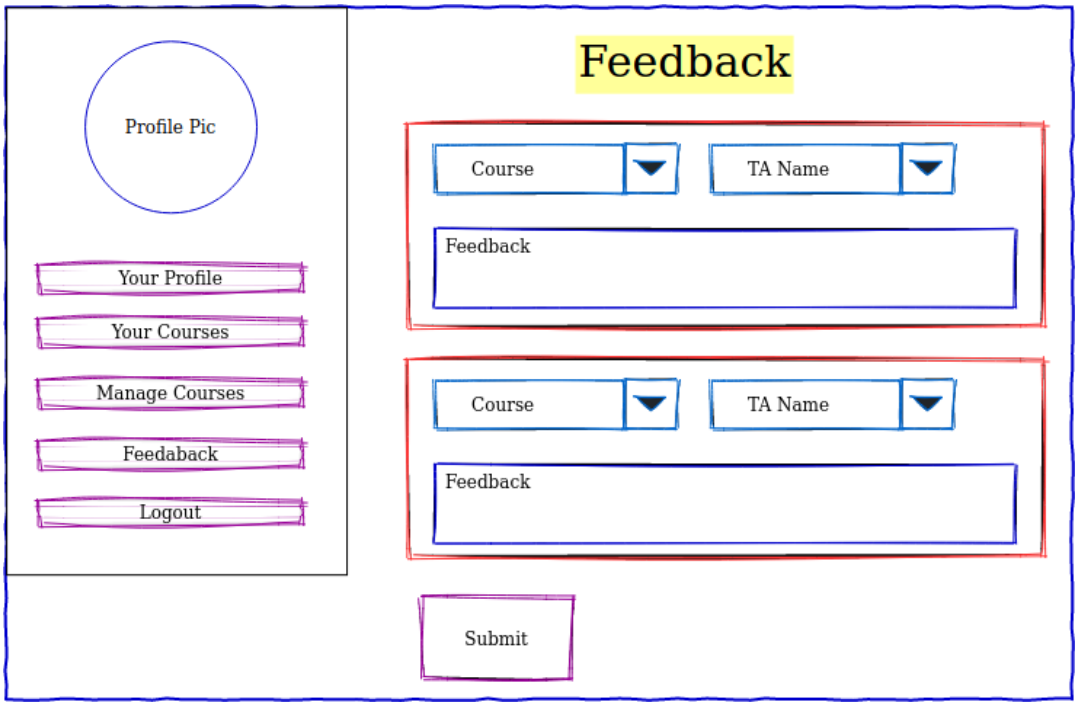

Figure 5.7: Interface for submitting feedback of TA by the Professor.