



# TA Management System

Deliverable-2 1st Iteration

16.03.2025

**Course:** CS 319

**Section:** 01

**Group No.:** 7

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## **Contents**

1. Non-Functional Requirements	3
2. State Diagrams	6
3. Class Diagram	7
4. Activity Diagrams	8
5. Sequence Diagram	10
6. Mockups	11

# 1. Non-Functional Requirements

Here are 6 key non-functional requirements for our TA Management System:

## 1. Security and Access Control

- a.** The system must implement role-based access control (RBAC) for different user types: TA, Faculty, Department Staff, Department Chair, Dean, and Admin.
- b.** User authentication must be performed using HTTPS and JWT-based token authentication, to prevent unauthorized access through secure session management and encryption protocols.
- c.** Sensitive data (e.g., names, emails, grades, attendance, duties) of students and staff must be encrypted in transit (via TLS 1.3) and at rest (AES-256 encryption in the database).
- d.** All user actions (e.g., logins, duty logs, approvals) must be time stamped and stored in an audit log table for at least 6 months to support traceability and accountability.

## 2. Performance and Scalability

- a.** The system should support at least 200 concurrent users during peak times (e.g., before exam periods or semester start) without degrading performance.
- b.** All database queries related to duty creation, assignment checks, and report generation must execute within 1 seconds under normal load, and within 2 seconds under peak load (99th percentile).
- c.** The system must scale to support 10 departments and 500+ TAs, maintaining stable response times and functional integrity.
- d.** Average response time for critical API calls (e.g., login, duty submission, duty list fetching) must be under 4 seconds, even under load.

## 3. Reliability and Availability

- a.** The system must be available 99.9% of the time (i.e., downtime < 10 hours/365 days), except for planned maintenance.

**b.** Daily automatic backups of the production database must be performed, with a 7-day retention policy and offsite storage.

**c.** Errors should be logged with error codes, context, and timestamps, and users must receive user-friendly messages like “Login failed: invalid credentials”.

## 4. Usability and User Experience

**a.** The interface must be designed with accessibility in mind, using clear labels, consistent navigation, and following WCAG 2.1 Level AA guidelines.

**b.** The system must be responsive across common screen sizes (mobile  $\geq$  360px, tablet  $\geq$  768px, laptop  $\geq$  1280px) and tested on devices like:

- Chrome on Windows/macOS
- Safari on iPad
- Firefox on Android
- Edge on Surface tablets

**c.** Notifications must be:

- Displayed within 5 seconds of an event (e.g., duty approved)
- Actionable (e.g., "Mark as read")

## 5. Interoperability and Compatibility

**a.** The system must support Linux-based deployment with Apache2, a MySQL 8.0+ database, and must support deployment on AWS and containerized via docker.

**b.** The system must support import/export of Excel (.xlsx) files and .csv and with headers for:

- TA lists
- Course offerings
- Assignment schedules

**c.** Integration with SMTP services (e.g., Gmail, Outlook, SendGrid) must allow sending of password reset emails and assignment notifications with <10s delivery time.

**d.** Full compatibility with:

- Chrome (v100+)
- Firefox (v95+)
- Safari (v15+)
- Microsoft Edge (v100+)

## 6. Maintainability

**a.** The codebase must follow PEP8 (Python) and React coding conventions, including:

- Descriptive variable names
- Modular file structure
- Type annotations in both backend (Python) and frontend (TypeScript)

**b.** The system architecture should support future enhancements through:

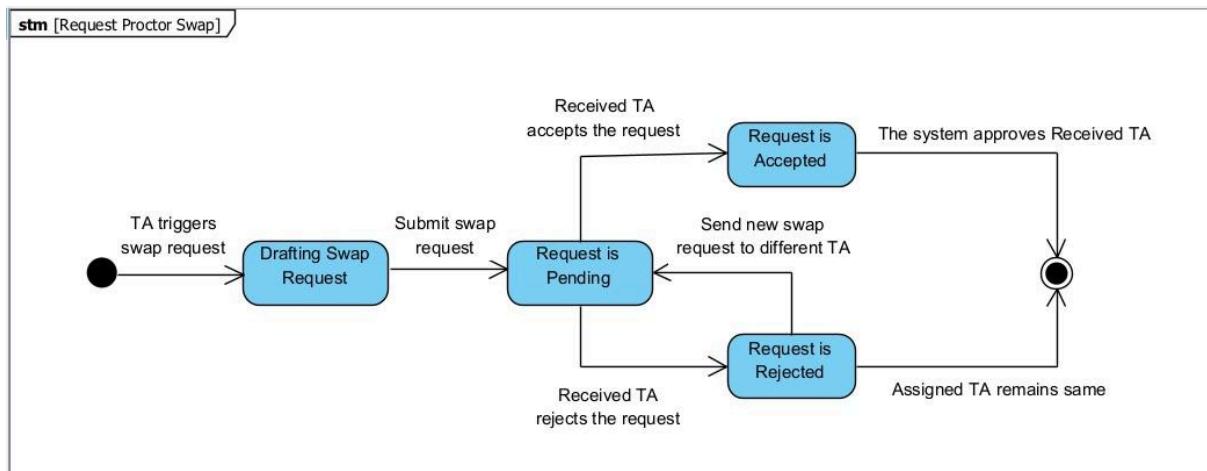
- Clear separation of concerns (MVC on backend, component-based frontend)
- Well-documented API endpoints using Swagger/OpenAPI

**c.** The backend must be configurable via environment variables (.env) so that academic policy changes (e.g., max duty hours) can be updated without code changes.

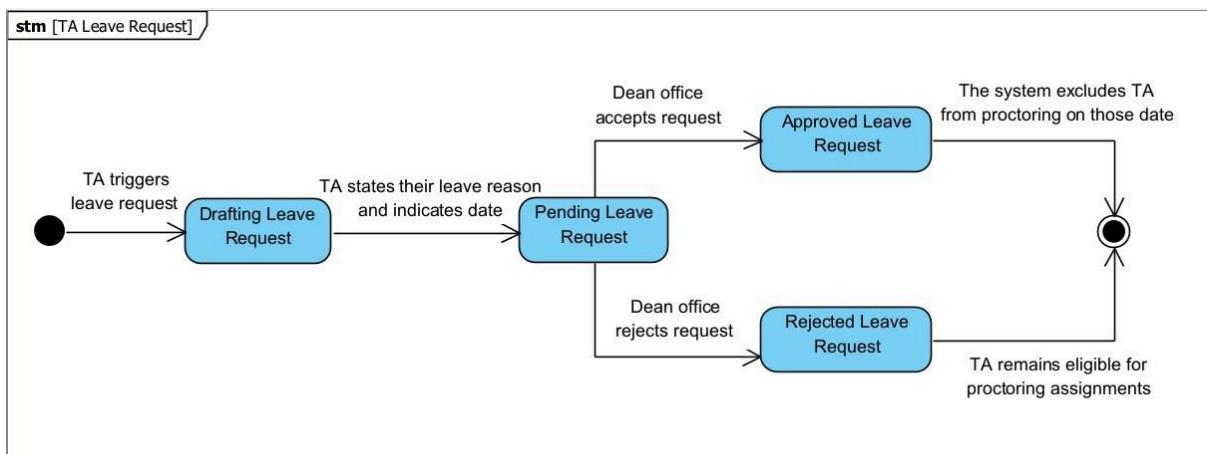
These non-functional requirements address the quality attributes that are crucial for our TA Management System's success beyond just the functional features described in previous documentation.

## 2. State Diagrams

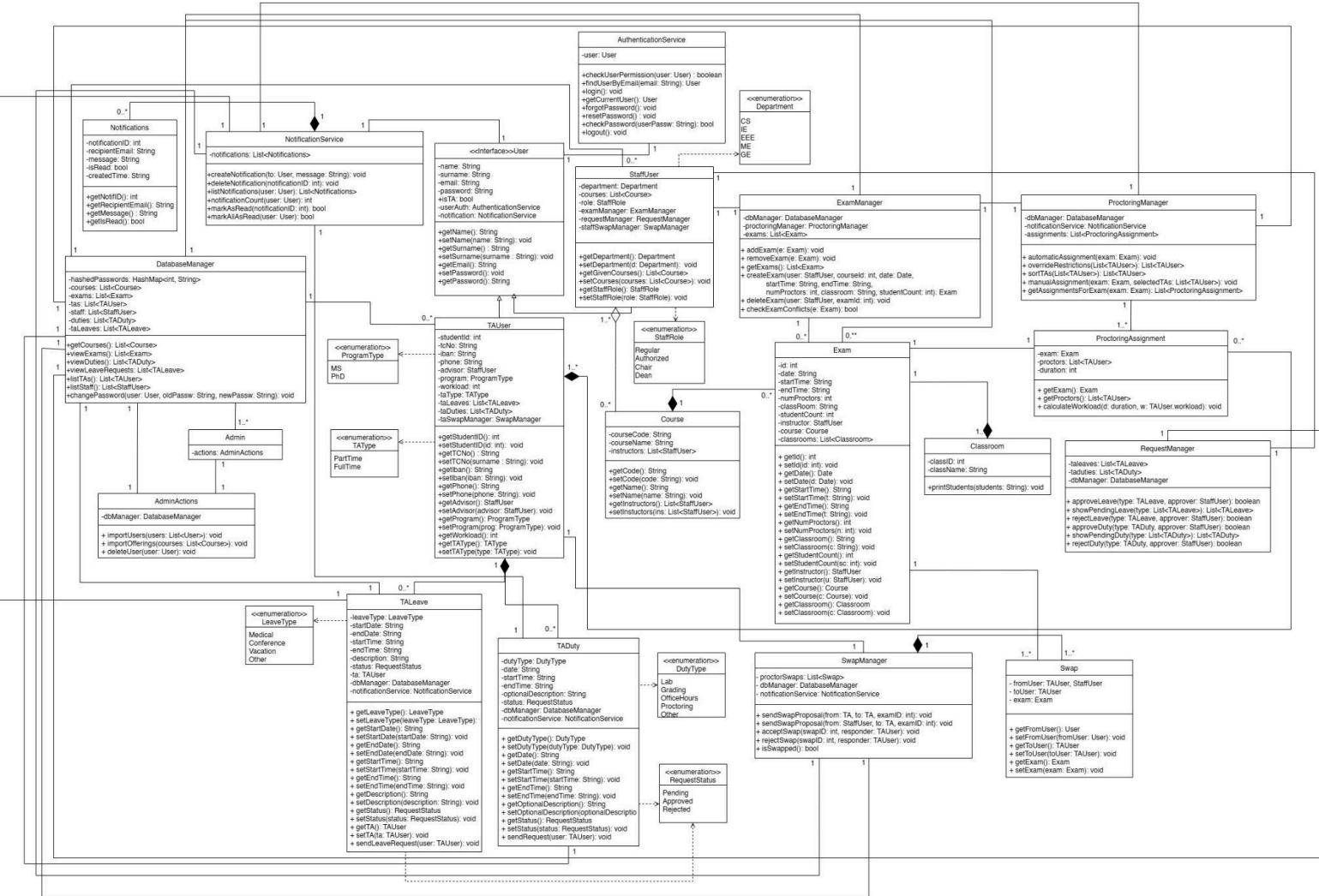
### 1. Request Proctor Swap



### 2. TA Leave Request

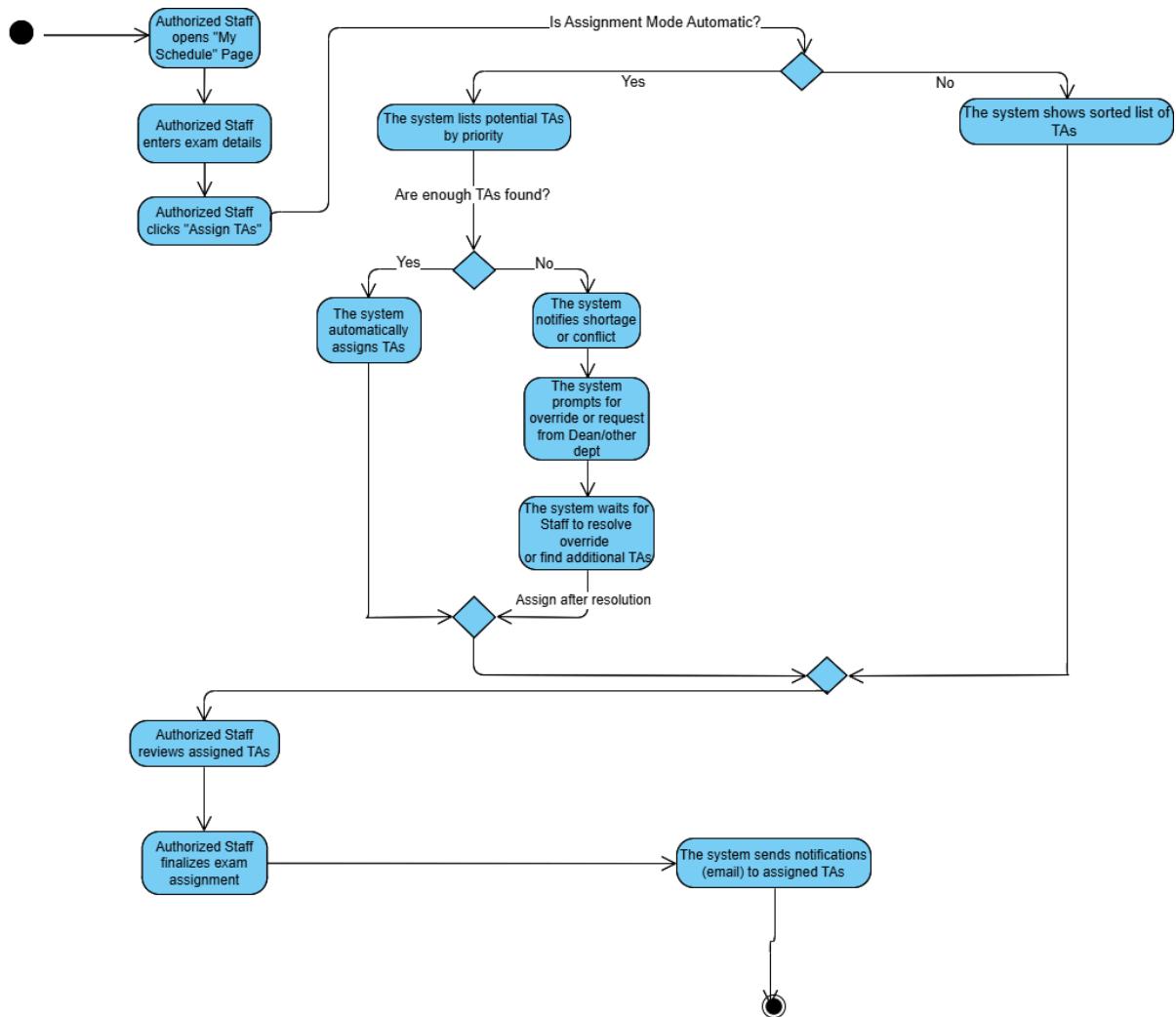


### 3. Class Diagram

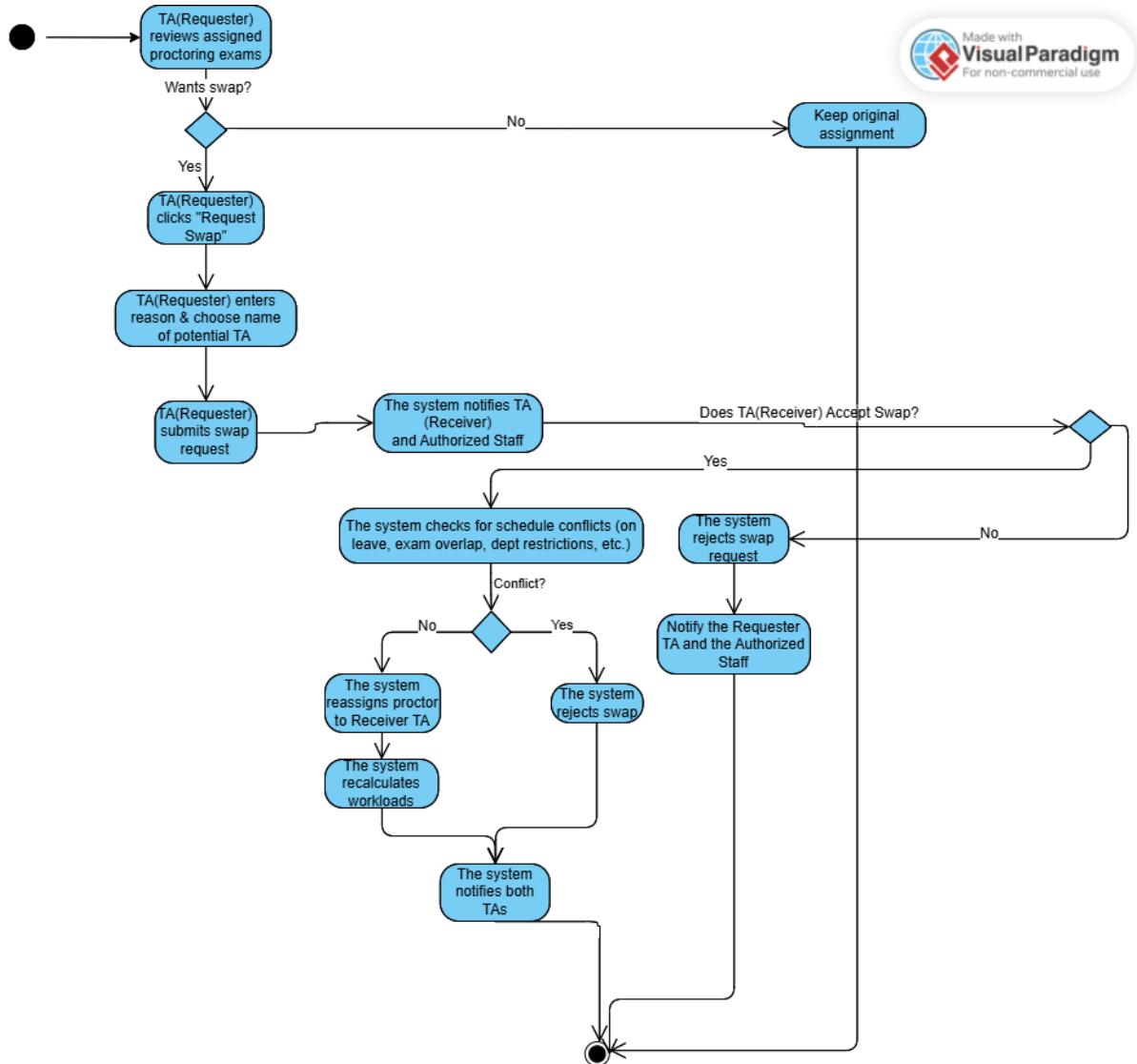


## 4. Activity Diagrams

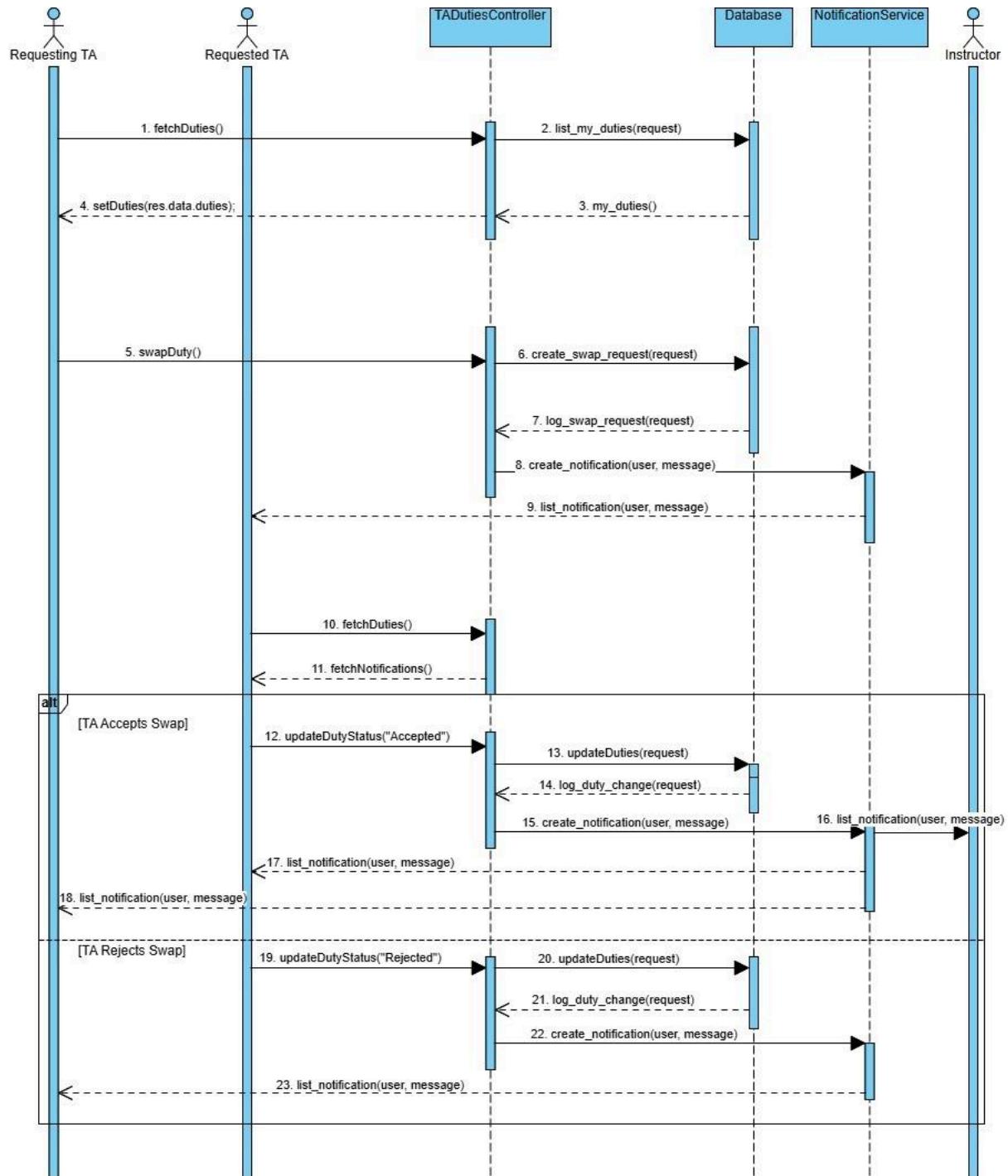
### 1. Proctor Assignment



## 2. Request Swap

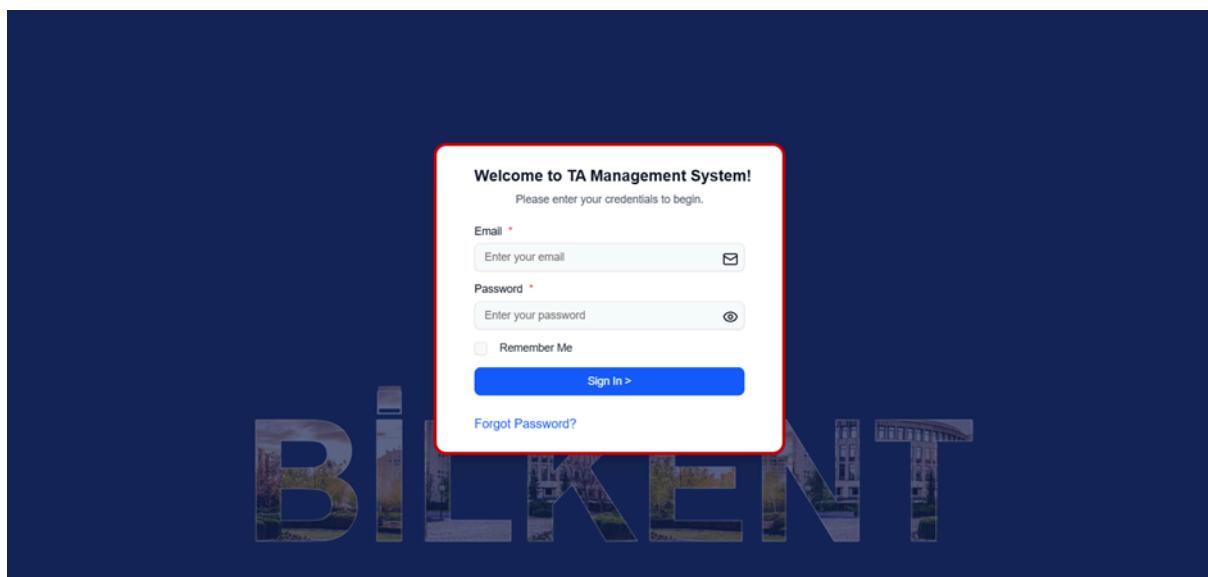


## 5. Sequence Diagram

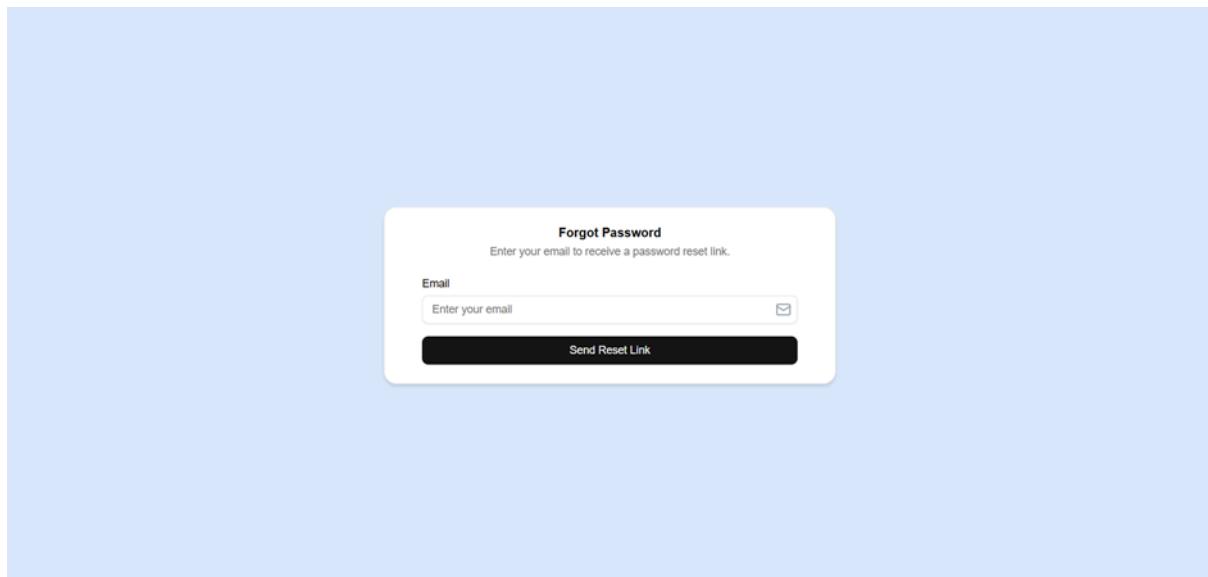


## 6. Mockup UI

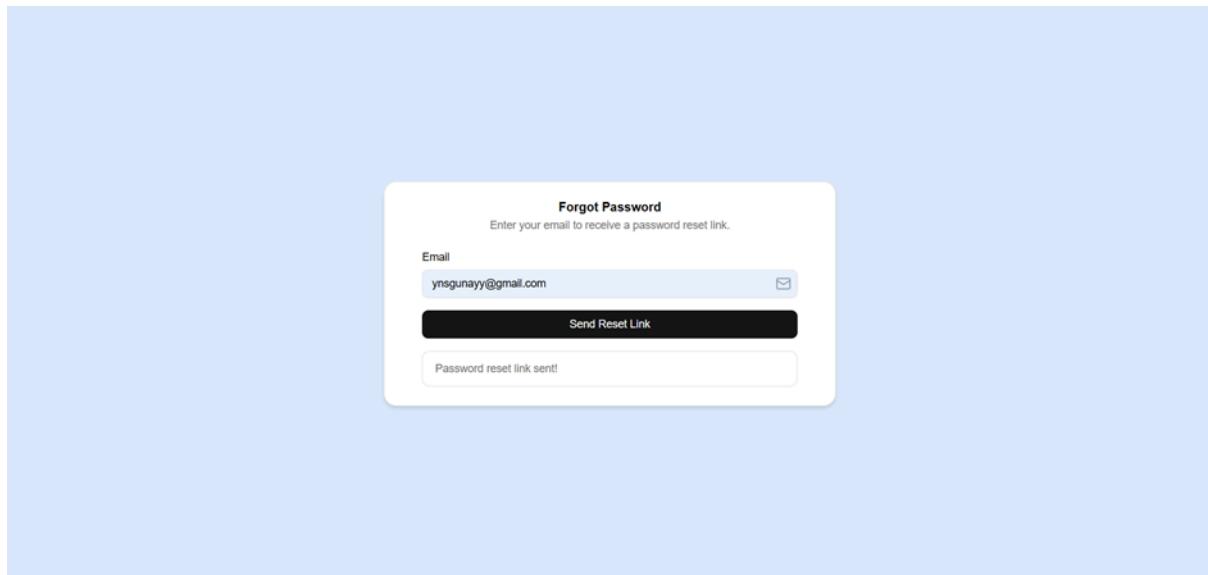
### 6.1.1 Login page



### 6.1.2. Forgot Password



### 6.1.3. Password Reset Link Sent



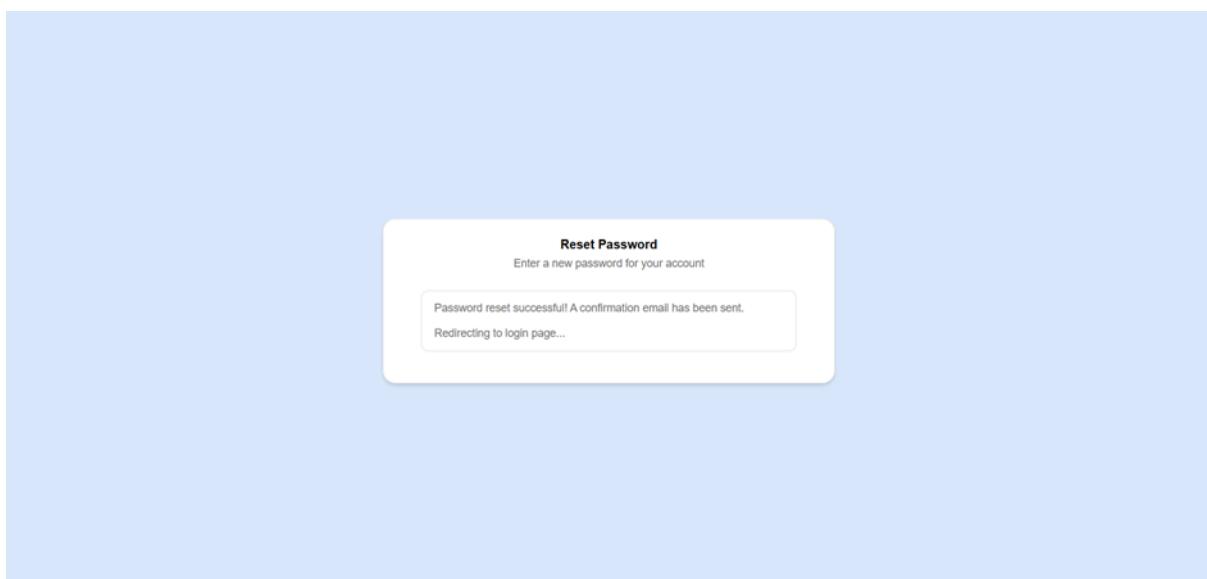
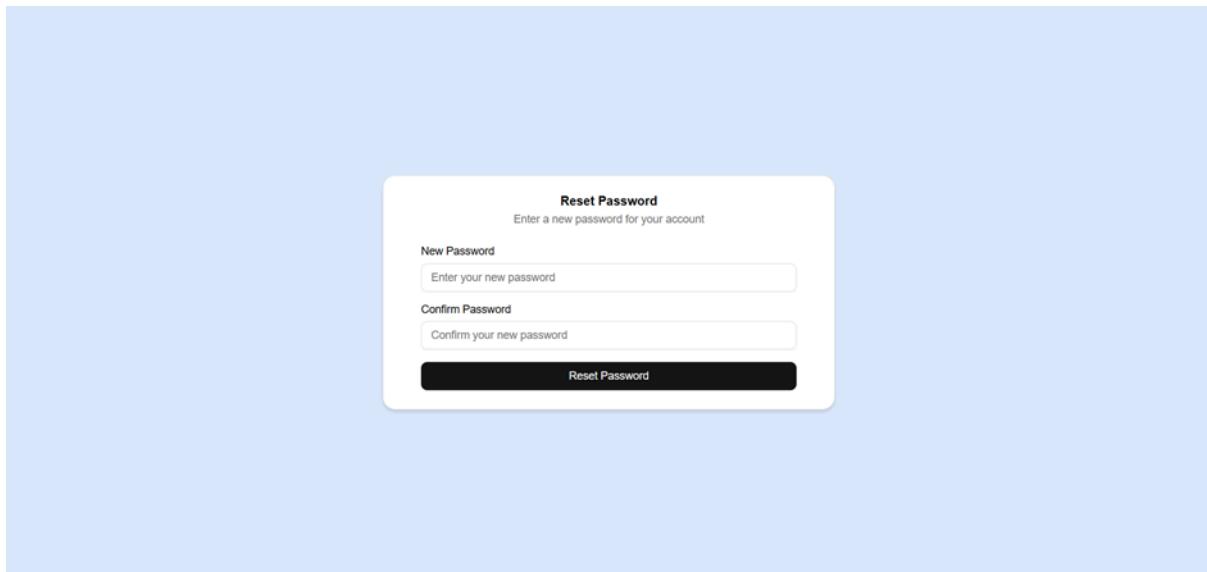
#### Password Reset Request Gelen Kutusu ×



Click here to reset your password: <http://localhost:3000/auth/reset-password?token=1zpMUnouMpbfy0e1aiADFBcCsMKSpZ20f1L27LGdvBTw>

This link will expire in 3 minutes.

#### 6.1.4. Reset Password



Password Successfully Reset Gelen Kutusu x

 **tamanagementsystem@gmail.com** 13:47 (1 dakika önce) ★

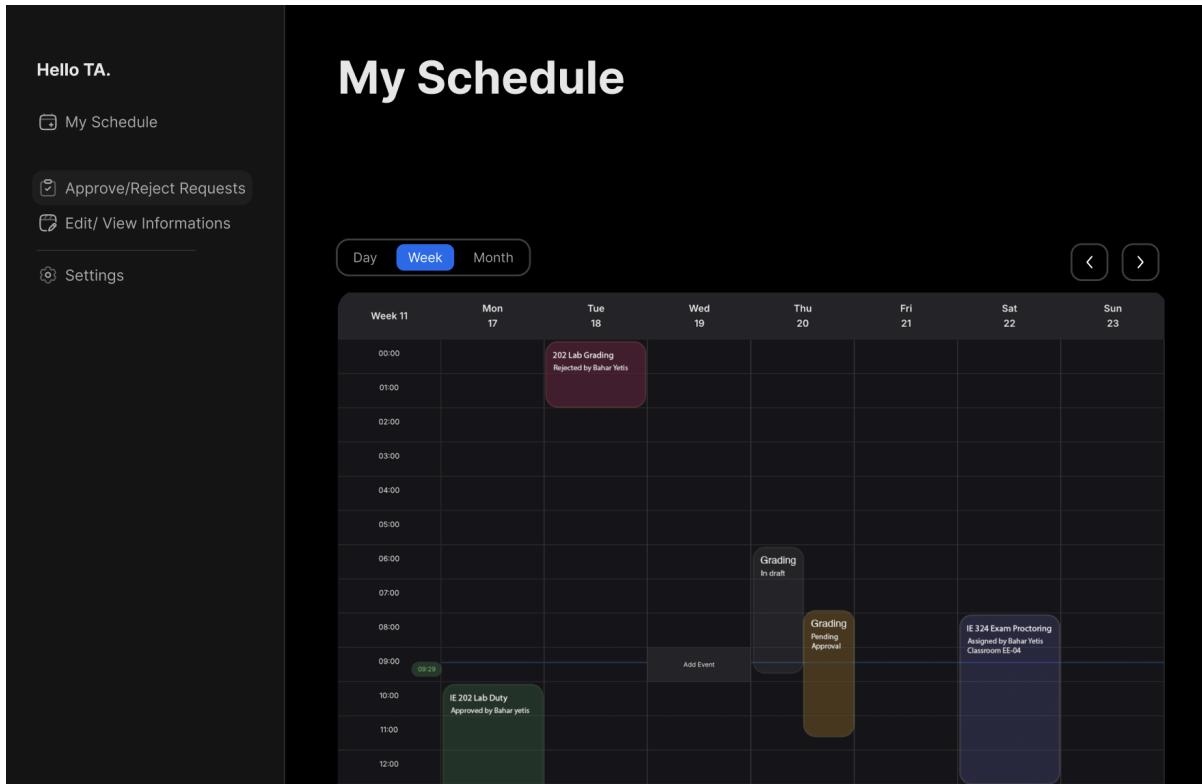
Alici: ben ▼

✉ [Türkçe diline çevir](#) ×

Your password has been successfully reset. Click here to login: <http://localhost:3000/>

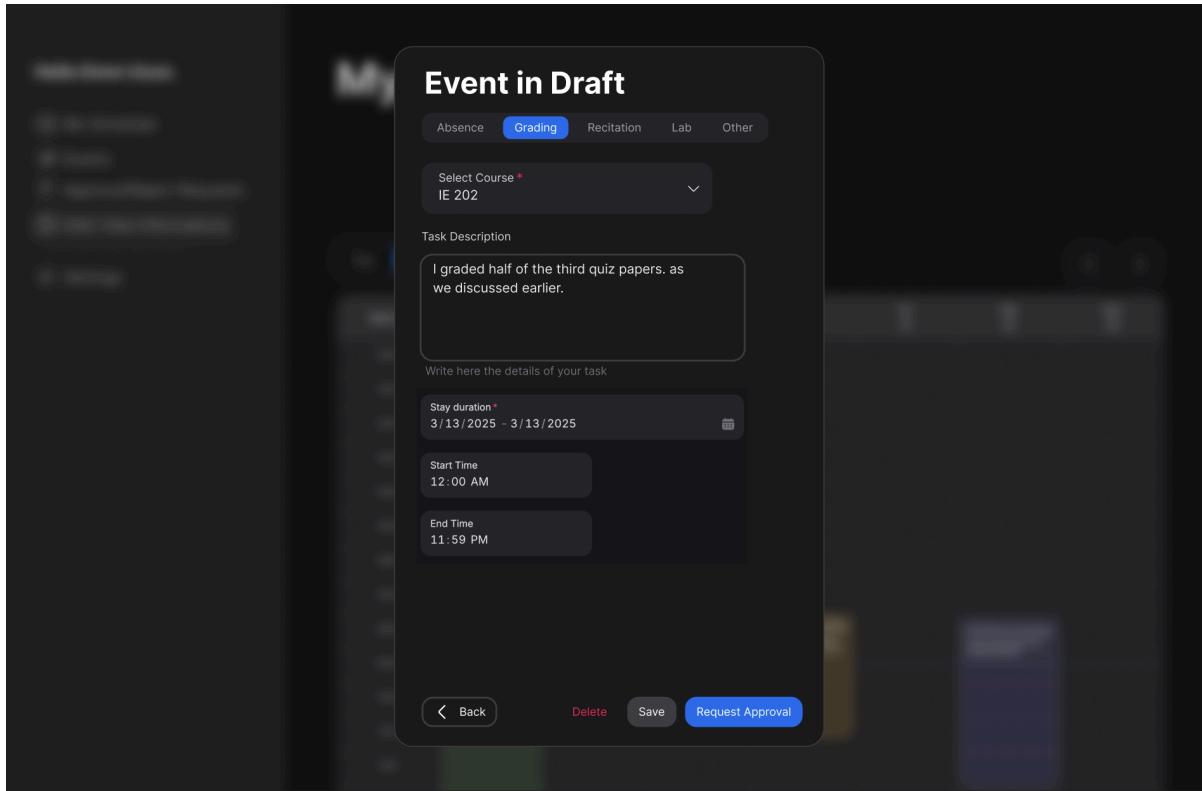
◀ Yanıtlı ▶ Yönлendir 😊

## 6.2 TA Home Page: My Schedule



The screenshot shows the 'My Schedule' section of the TA home page. On the left sidebar, there are links: 'Hello TA.', 'My Schedule' (selected), 'Approve/Reject Requests', 'Edit/ View Informations', and 'Settings'. The main area has tabs for 'Day', 'Week' (selected), and 'Month'. It displays a weekly calendar from Monday, March 17, to Sunday, March 23. A red box highlights an event on Tuesday, March 18, from 01:00 to 02:00 labeled '202 Lab Grading Rejected by Bahar Yetis'. Other events include 'Grading In draft' on Wednesday, 'Grading Pending Approval' on Friday, and 'IE 202 Lab Duty Approved by Bahar yetis' on Saturday.

### 6.2.1. My Schedule Event Add/Edit Page



The screenshot shows the 'Event in Draft' form. At the top, it says 'Event in Draft' with tabs for 'Absence', 'Grading' (selected), 'Recitation', 'Lab', and 'Other'. Below that is a dropdown for 'Select Course \*' showing 'IE 202'. The 'Task Description' field contains the text: 'I graded half of the third quiz papers. as we discussed earlier.' Below it is a note: 'Write here the details of your task'. Under 'Stay duration \*', it shows '3/13/2025 - 3/13/2025'. The 'Start Time' is '12:00 AM' and the 'End Time' is '11:59 PM'. At the bottom are buttons for '< Back', 'Delete', 'Save' (disabled), and 'Request Approval'.

## 6.2.2. My Schedule Exam Details Swap Appeal Page

**Swap/ appeal for IE 521 Midterm I**

Exam date and time: Sunday, 25 March, 9:00 - 12:00  
Classrooms (4): EE-03, EE-04, EE-05, EE-06 → Print student classroom distribution [alphabetically](#) or [random](#).

Select a proctor you want to swap with, if you have no choice and just want to be discharged do not select. You can't select already assigned ones.

and write here the description of your excuse.  
content |

<input type="checkbox"/>	NAME	DEPARTMENT	WORKLOAD	REMARKS
<input type="checkbox"/>	Emre Uzun	IE	34.3h	<span>Own Course</span>
<input type="checkbox"/>	Dogus Berk Kocak	IE	32.5h	
<input type="checkbox"/>	Gencay Pekdogru	IE	40.3	
<input type="checkbox"/>	Sunay Sayan	IE	41.6h	
<input type="checkbox"/>	Yuksel Yilmaz	IE	32.8h	<span>Swapped Before</span>
<input type="checkbox"/>	Sobhan Teal	IE	43h	<span>PHD/MS Level</span>
<input type="checkbox"/>	John Pork	CS	45h	<span>Department Mismatch</span> <span>Close Work/Exam</span>
<input type="checkbox"/>	Idil Yazgan	IE	48.5	<span>Absent</span> <span>Exceeds Total Workload</span>

[Back](#) [Request Swap/ Appeal](#)

## 6.3. Staffs' and Admin's Home page: Exams

Hello Staff.

Exams

Approve/Reject Requests

Edit/ View Informations

Settings

# Exams

Day Week Month

Week 11	Mon 17	Tue 18	Wed 19	Thu 20	Fri 21	Sat 22	Sun 23
00:00							
01:00							
02:00							
03:00							
04:00							
05:00							
06:00							
07:00							
08:00							
09:00	09-29			Add Event			
10:00							
11:00							
12:00							

IE 375 Exam  
Classroom EE-04, EE-05

IE 400  
Classroom EE-03, EE-04, EE-05

### 6.3.1. Proctor Assign Page for Staff and Admin

The screenshot shows a list of staff members assigned as proctors for the IE 521 Midterm I exam. The table includes columns for Name, Department, Workload, and Remarks. Several staff members have exceeded their workload capacity.

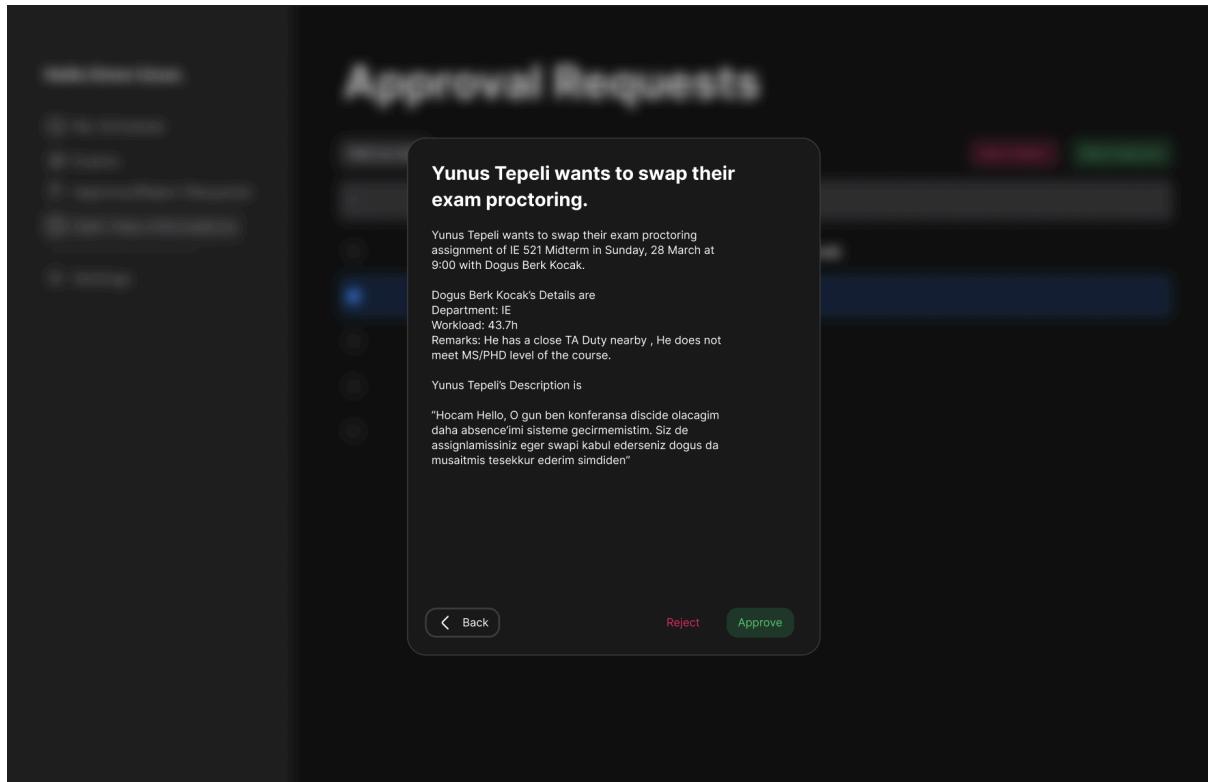
NAME	DEPARTMENT	WORKLOAD	REMARKS
Emre Uzun	IE	34.3h	Own Course
Dogus Berk Kocak	IE	32.5h	
Gencay Pekdogru	IE	40.3	
Sunay Sayan	IE	41.6h	
Yuksel Yilmaz	IE	32.8h	Swapped Before
Sobhan Teal	IE	43h	PHD/MS Level
John Pork	CS	45h	Department Mismatch
Idil Yazgan	IE	48.5	Absent, Exceeds Total Workload

### 6.4. Approve Requests Page

The screenshot shows a list of approval requests categorized by type. The table includes columns for Description, Status, and From. Each request has 'Reject' and 'Approve' buttons.

DESCRIPTION	STATUS	FROM	
Workload: Other	Pending	Dogus Berk Kocak	Reject Approve
Absence	Pending	Yunus Tepeli	Reject Approve
Swap Request	Approved	Berkan Sahin	Reject Approve
Workload: Lab	Approved	Idil Yazgan	Reject Approve
Workload: Grading	Rejected	Erdem Unal	Reject Approve

### 6.4.1. Approve Requests Detail Subpage



### 6.5.1. Student Data Page

## Information Management

In this page you can edit and view the student, staff, offering, and classroom entities in the system. App will work based on these entries.

Students   Staff   Offerings   Classrooms

	NAME	IS TA	DEPARTMENT	MS/PHD LEVEL	ID	ACTIONS
<input type="checkbox"/>	Idil Yazgan	TA	IE	Masters	21809987	<input type="button" value="Edit"/>
<input type="checkbox"/>	Dogus Berk Kocak	TA	IE	PHD	23901432	<input type="button" value="Edit"/>
<input type="checkbox"/>	Yunus Tepeli	TA	IE	None	34231525	<input type="button" value="Edit"/>
<input type="checkbox"/>	John Pork		IE	None	43242153	<input type="button" value="Edit"/>
<input type="checkbox"/>	Yigit Eyi		IE	None	12355436	<input type="button" value="Edit"/>

Search by name...   Filter Department: IE

### 6.5.1.1 Student Information Edit Subpage

**Student Details**

E-mail in the system  
berk.kocak@bilkent.edu.tr

Full Name  
Dogus Berk Kocak

ID  
21708957

Department  
IE

MS/PHD Level  
None

Courses:  
IE 376 X IE 451 X Fa|

Student is a TA

UPDATE THE PASSWORD  
\*\*\*\*\*

System will replace the existing password with the one you entered.

ADMIN PASSWORD  
\*\*\*\*\*

Extra protection layer. Only admins can edit the password information.

[Back](#) [Delete](#) [Save](#)

### 6.5.2.. Staff Data Page

## Information Management

In this page you can edit and view the student, staff, offering, and classroom entities in the system. App will work based on these entries.

Students [Staff](#) Offerings Classrooms

	NAME	ROLE	DEPARTMENT	ACTIONS
<input type="checkbox"/>	Emre Uzun	Faculty	IE	<a href="#">Edit</a>
<input type="checkbox"/>	Dogus Berk Kocak	Dean	CS	<a href="#">Edit</a>
<input type="checkbox"/>	Begum Clnar	Admin	IE	<a href="#">Edit</a>
<input type="checkbox"/>	Eray Tuzun		IE	<a href="#">Edit</a>
<input type="checkbox"/>	Can Alkan		IE	<a href="#">Edit</a>

[View & update](#) [Delete](#)

[Batch Delete](#) [Batch Import](#) [+ Add a new entry](#)

### 6.5.2.1. Staff Information Edit Subpage

**Staff Details**

E-mail in the system  
berk.kocak@bilkent.edu.tr

Full Name  
Dogus Berk Kocak

Department  
IE

Roles:

Chair X Faculty X Dea|

Offerings:

IE376-1 X IE451-2 X Fa|

UPDATE THE PASSWORD  
\*\*\*\*\*  
System will replace the existing password with the one you entered.

ADMIN PASSWORD  
\*\*\*\*\*  
Extra protection layer. Only admins can edit the password information.

< Back      Delete      Save

### 6.5.3. Offerings Data Page

**Information Management**

In this page you can edit and view the student, staff, offering, and classroom entities in the system. App will work based on these entries.

Students Staff Offerings Classrooms

Search by name... Filter Department None

	COURSE	SECTION	INSTRUCTOR	QUOTA/ AVAILABLE	ACTIONS
<input type="checkbox"/>	IE 324 Simulat...	1	Emre Uzun	45/7	<input type="button" value="Edit"/>
<input type="checkbox"/>	IE 324 Simulat...	2	Emre Uzun	45/8	<input type="button" value="Edit"/>
<input type="checkbox"/>	IE 376 Product...	1	Emre Nadar	45/6	<input type="button" value="Edit"/>
<input type="checkbox"/>	IE 451 Data An...	1	Savas Dayanik	60/23	<input type="button" value="Edit"/>
<input type="checkbox"/>	CS 115 Introduc...	4	Aynur Dayanik	30/7	<input type="button" value="Edit"/>

View & update  
Delete

### 6.5.3.1. Offering Information Edit Subpage

The screenshot shows the 'Offering Details' subpage. At the top, there's a dropdown for 'IE 376 Production Systems' with the subtext 'Course of this offering'. Below it are two buttons: 'Section 2' and 'Quota 45'. A dropdown for 'Instructor' lists 'Emre Uzun'. Another dropdown for 'Student' lists 'Yigit Eyi, yigit.eyi..., 22209898' with an 'Add this student' button next to it. A search bar 'Search by name...' is followed by a 'Batch Delete' button. The main area displays a table of student enrollments:

<input type="checkbox"/>	STUDENT NAME	ID	E-MAIL	ACTION
<input checked="" type="checkbox"/>	(TA) Dogus Berk Ko...	22204567	berk.kocak@t...	
<input type="checkbox"/>	Gunes Dogan	32435442	gunes.dogan@...	Delete
<input type="checkbox"/>	John Pork	23094324	john.pork@ug...	
<input type="checkbox"/>	Leyla Hakan	34594350	leyla.hakan@u...	

At the bottom are 'Back', 'Delete', and 'Save' buttons.

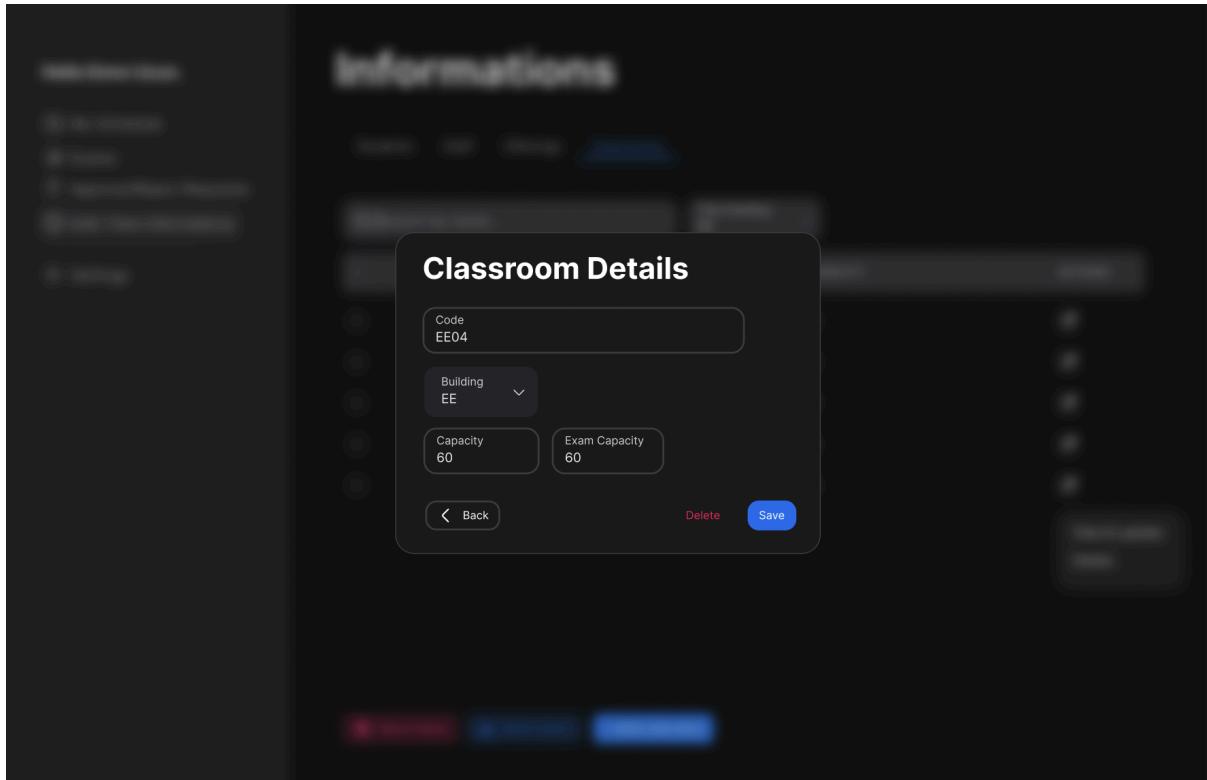
### 6.5.4. Classroom Data Page

The screenshot shows the 'Information Management' page with a sidebar for 'Hello Emre Uzun' and links like 'My Schedule', 'Exams', 'Approve/Reject Requests', 'Edit/ View Informations', and 'Settings'. The main content area has a title 'Information Management' with a sub-instruction: 'In this page you can edit and view the student, staff, offering, and classroom entities in the system. App will work based on these entries.' It features tabs for 'Students', 'Staff', 'Offerings', and 'Classrooms' (which is selected). A search bar 'Search by name...' and a filter 'Filter Building EE' are at the top. The main table lists classrooms:

<input type="checkbox"/>	CLASSROOM	CAPACITY	ACTIONS
<input type="checkbox"/>	EE05	45	
<input type="checkbox"/>	EE04	45	
<input type="checkbox"/>	EE01	45	
<input type="checkbox"/>	EE03	60	
<input type="checkbox"/>	EE214	30	

At the bottom are 'View & update', 'Delete', 'Batch Delete', 'Batch Import', and '+ Add a new entry' buttons.

#### 6.5.4.1. Classroom Information Edit Subpage



#### 6.6. Settings Page

A screenshot of the Settings page. It features a sidebar with user info and links: "Hello Emre Uzun.", "My Schedule", "Exams", "Approve/Reject Requests", "Edit/ View Informations", and "Settings". The main content area has a title "Settings" and sections for "Personal Settings" (password fields) and "Reports" (download logs and sheets). The "Admin Settings" section shows "Current Semester: Fall 2025" and "Max Workload for a TA: 50 Hours".