TA Management System

CS319 - Deliverable 1

Final Version

Section 1

Team 9

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0. USE CASE DIAGRAM

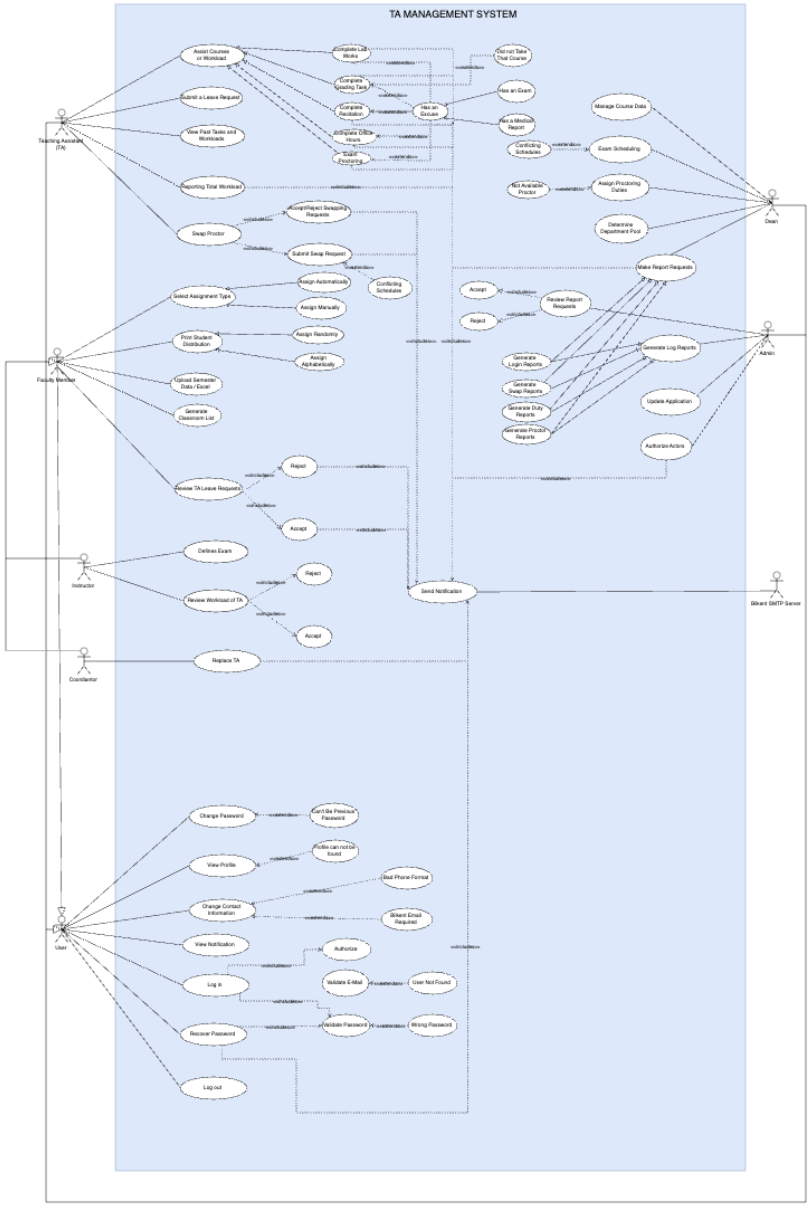

Figure 1: TA Management System Use Case Diagram

Drawio Link: `https://app.diagrams.net/#G1iOR3LNgbxf5vZur8pri7EJvYYD50yjc9#%7B%22pageId%22%3A%22DWiu8bJZ94A5XNGSTLAS%22%7D`

1 USE CASE TEXTUAL DESCRIPTION

The following use cases describe the primary interactions within the TA Management System. Each use case is specified with its name, actors, entry and exit conditions, quality requirements, the main flow of events, and exceptional flows.

1.1 Authentication

1.1.1 Login

Name: Login
Actors: User (TA, Faculty, Authorized Staff, etc.)
Entry Conditions:

- The user is not currently logged in.

Exit Conditions:

- If successful, the user is granted access to features appropriate to their role.
- If unsuccessful, the user remains on the Login page with error feedback.

Quality Requirements:

- Response time under 2 seconds.
- Credentials are transmitted securely (e.g., via encryption).
- Error messages do not disclose sensitive information.

Main Flow:

1. The user navigates to the Login page.
2. The user enters their email/username and password.
3. The system validates the credentials and checks the email format.
4. Upon successful validation, the system determines the user's role, initiates a session, and redirects to the appropriate dashboard.

Exceptional Flows:

User Not Found: The system displays an error if the email/username is not recognized.
Incorrect Password: An error is shown if the password is incorrect.
Invalid Email Format: An error is displayed if the email does not meet the required format (e.g., a Bilkent email).

1.1.2 Reset Password

Name: Reset Password
Actors: User
Entry Conditions:

- The user has forgotten their password or has requested a reset.

Exit Conditions:

- The user successfully resets their password, or an error is shown if the account cannot be found.

Quality Requirements:

- Secure handling of reset links/codes.
- The process completes within 2 minutes.

Main Flow:

1. The user accesses the Reset Password page (linked from the Login page).
2. The system prompts the user to enter their registered email/username.
3. The system verifies the existence of the account.
4. If found, the system sends a reset link or code to the user's email.
5. The user follows the link (or enters the code) and submits a new password.
6. The system validates the new password against complexity rules and updates the account.

Exceptional Flows:

User Not Found: An error is displayed if no account matches the provided email.
Weak New Password: An error is shown if the new password fails to meet complexity requirements.

1.1.3 Log Out

Name: Log Out
Actors: User
Entry Conditions:

- The user is currently logged in.

Exit Conditions:

- The user's session is terminated and they are redirected to a public or Login page.

Quality Requirements:

- Session termination occurs within 1 second.
- All session data and cookies are securely cleared.

Main Flow:

1. The user clicks the Log Out button or link.
2. The system invalidates the session and clears any session cookies.
3. The user is redirected to the Login page.

Exceptional Flows:

Expired Session: If the session is already expired, the system simply redirects to the Login page.

1.1.4 Authorize Access

Name: Authorize Access
Actors: Admin, Coordinator, TA (any authenticated user)
Entry Conditions:

- The user has successfully logged in.

Exit Conditions:

- The user gains access only to functionalities and data permitted by their role.

Quality Requirements:

- Authorization checks are completed within 1 second.
- Role data is securely retrieved and validated.

Main Flow:

1. Upon successful login, the system retrieves the user's role from the database.
2. The system loads a secure token (e.g., JWT) that includes the role information.
3. When the user attempts to access a resource, the system evaluates the user's permissions.
4. Access is granted or denied based on these permissions.

Exceptional Flows:

Permission Denied: The system displays an error if the user attempts an unauthorized action.

1.2 Profile Management

1.2.1 View Profile

Name: View Profile
Actors: User
Entry Conditions:

- The user is logged in.

Exit Conditions:

- The user's profile information (e.g., name, email, phone number, role) is displayed.

Quality Requirements:

- Profile data is retrieved and displayed within 2 seconds.

Main Flow:

1. The user navigates to the View Profile section.
2. The system retrieves the user's profile data.
3. The data is displayed on the screen.

1.2.2 Change Password

Name: Change Password
Actors: User
Entry Conditions:

- The user is logged in.

Exit Conditions:

- The user's password is updated in the system.

Quality Requirements:

- The password update process is secure and completed promptly.

Main Flow:

1. The user navigates to the Change Password section.
2. The system prompts the user to enter the current password and a new password (with confirmation).
3. The system validates the current password.
4. The system checks the new password against complexity requirements and ensures it differs from the current password.
5. Upon successful validation, the system updates the password and confirms the change.

Exceptional Flows:

Incorrect Current Password: The system displays an error prompting re-entry.
Invalid Complexity: The system displays an error if the new password does not meet the required complexity.

1.2.3 Change Contact Information

Name: Change Contact Information
Actors: User
Entry Conditions:

- The user is logged in.

Exit Conditions:

- The user's contact information (phone, email, etc.) is successfully updated.

Quality Requirements:

- Contact information validation is performed immediately.

Main Flow:

1. The user navigates to the Change Contact Information section.
2. The system displays the current contact details.
3. The user enters updated contact information.
4. The system validates the format of the new data (e.g., phone number, email domain).
5. Upon successful validation, the system updates the profile and confirms the changes.

Exceptional Flows:

Invalid Phone Format: An error is displayed if the phone format is incorrect.
Non-Bilkent Email: An error is shown if the user attempts to remove or alter the institutional (Bilkent) email.

1.3 Communication

1.3.1 View Notifications

Name: View Notifications
Actors: User
Entry Conditions:

- The user is logged in.

Exit Conditions:

- The user's notifications (assignment updates, approval notices, etc.) are displayed.

Quality Requirements:

- Notifications are retrieved and displayed within 2 seconds.

Main Flow:

1. The user navigates to the Notifications section.
2. The system retrieves all relevant notifications.
3. Notifications are displayed in chronological or priority order.

1.4 TA Management

1.4.1 Manage TA Courses and Workload

Name: Manage TA Courses and Workload
Actors: Teaching Assistant
Entry Conditions:

- The TA is logged in and assigned to at least one course.

Exit Conditions:

- Task completion is recorded and the TA's workload is updated.

Quality Requirements:

- Task updates and workload calculations are processed within 3 seconds.

Main Flow:

1. The TA navigates to the Courses and Workload section.
2. The system displays assigned tasks (e.g., lab work, grading, office hours, exam proctoring).
3. The TA marks tasks as complete or enters necessary details (e.g., hours worked).
4. The system updates the overall workload accordingly.

Exceptional Flows:

Unauthorized Task: The system prevents a TA from marking tasks for courses they are not assigned to.
Conflict in Hours: The system flags any discrepancies in reported hours.

1.4.2 Submit Leave Request

Name: Submit Leave Request
Actors: Teaching Assistant
Entry Conditions:

- The TA is logged in.

Exit Conditions:

- The leave request is processed (approved or rejected) and the TA's availability is updated accordingly.

Quality Requirements:

- Request processing should occur within 2 seconds, and notifications must be sent promptly.

Main Flow:

1. The TA navigates to the Leave Request section.
2. The system prompts for leave dates and a reason (e.g., medical, conference).
3. The TA submits the request.
4. The system notifies the authorized staff for review.
5. The authorized staff reviews and processes the request.
6. The system updates the TA's status based on the decision.

Exceptional Flows:

Overlapping Leave Requests: The system prevents submission if the requested dates overlap with an existing approved leave.

1.4.3 View Past Tasks and Workloads

Name: View Past Tasks and Workloads
Actors: Teaching Assistant
Entry Conditions:

- The TA is logged in.

Exit Conditions:

- Historical data for completed tasks and workloads is displayed.

Quality Requirements:

- Data retrieval must be efficient (within 2 seconds).

Main Flow:

1. The TA navigates to the Past Tasks section.
2. The system retrieves historical task and workload records.
3. The data is displayed for review.

1.4.4 Generate Workload Report

Name: Generate Workload Report
Actors: Teaching Assistant
Entry Conditions:

- The TA is logged in.

Exit Conditions:

- A comprehensive workload report is generated and displayed.

Quality Requirements:

- Report generation should be completed within 5 seconds.

Main Flow:

1. The TA navigates to the Workload Report section.
2. The system compiles data on hours worked and tasks completed.
3. A report is generated and displayed.

1.4.5 Swap Proctor Duties

Name: Swap Proctor Duties
Actors: Teaching Assistant, Coordinator
Entry Conditions:

- The TA is assigned to an exam proctoring duty.

Exit Conditions:

- The proctor swap is successfully completed or the request is rejected.

Quality Requirements:

- Swap operations are processed in real time with immediate notifications.

Main Flow:

1. The TA navigates to the Proctor Duties section and selects "Submit Swap Request".
2. The TA chooses a replacement from the available list.
3. The system sends a notification to the chosen TA.
4. If the replacement TA accepts, the system updates the proctor assignment and notifies all parties.
5. If rejected, the system informs the original TA accordingly.

Exceptional Flows:

Scheduling Conflict: The system blocks the swap if the replacement TA is unavailable.

1.5 Faculty Tools

1.5.1 Manage TA Assignments

Name: Manage TA Assignments
Actors: Faculty Member
Entry Conditions:

- The faculty member is logged in and course/student data exists in the system.

Exit Conditions:

- TAs are assigned to courses according to the selected method and a confirmation is displayed.

Quality Requirements:

- Assignment operations are accurate and complete within 3 seconds.

Main Flow:

1. The faculty member navigates to the TA Assignment section.
2. The system presents assignment options (Automatic, Manual, Random, Alphabetical).
3. The faculty member selects the preferred method.
4. The system processes the assignment and updates the course rosters.

Exceptional Flows:

No Available TA: The system displays an error if there are no eligible TAs.
Section Over-Capacity: If a section is full, the system prompts for reassignment or an override.

1.5.2 Print Student Distribution

Name: Print Student Distribution
Actors: Faculty Member
Entry Conditions:

- The faculty member is logged in and student assignments are available.

Exit Conditions:

- A printable or downloadable report of student distribution is generated.

Quality Requirements:

- Report generation should occur within 3 seconds.

Main Flow:

1. The faculty member navigates to the Student Distribution section.
2. The system retrieves the student assignment data.
3. The faculty member selects the desired view (e.g., by section or capacity).
4. A preview is generated and can be printed or downloaded.

Exceptional Flows:

No Data Available: The system displays a message if no assignments are found.

1.5.3 Upload Semester Data

Name: Upload Semester Data
Actors: Faculty Member
Entry Conditions:

- The faculty member is logged in and the system supports file imports (Excel/CSV).

Exit Conditions:

- The semester data (courses, students, sections) is imported successfully or errors are flagged.

Quality Requirements:

- File validation and data import should be completed within 5 seconds.

Main Flow:

1. The faculty member navigates to the Upload Data section.
2. The system prompts for an Excel/CSV file upload.
3. The file is uploaded and validated (format, columns, data types).
4. On success, the data is imported and a summary report is displayed.

Exceptional Flows:

Invalid File Format: The system rejects unsupported file types.
Partial Import: If some rows are invalid, the system flags them for manual correction.

1.5.4 Generate Classroom List

Name: Generate Classroom List
Actors: Faculty Member
Entry Conditions:

- The faculty member is logged in and classroom allocation data is available.

Exit Conditions:

- A list of classrooms (with room numbers, capacities, schedule) is generated and displayed.

Quality Requirements:

- List filtering and generation should occur within 3 seconds.

Main Flow:

1. The faculty member navigates to the Generate Classroom List section.
2. The system retrieves classroom data.
3. The faculty member applies filters (e.g., date, time, building).
4. The system displays the filtered list of classrooms.

Exceptional Flows:

No Matching Classrooms: The system notifies the faculty member if no classrooms meet the criteria.

1.6 Dean Tools

1.6.1 Manage Course Data

Name: Manage Course Data
Actors: Dean
Entry Conditions:

- The Dean is logged in with privileges to manage course data.

Exit Conditions:

- Course data is created, updated, or removed and relevant stakeholders are notified.

Quality Requirements:

- Operations must ensure data consistency and complete within 3 seconds.

Main Flow:

1. The Dean navigates to the Manage Course Data section.
2. The system displays a list of existing courses with options to create, edit, or remove.
3. The Dean selects an action and inputs/updates course details.
4. The system validates the information and saves the changes.

Exceptional Flows:

Active Dependencies: The system prevents deletion of a course if TAs are assigned or exams are scheduled.
Missing Mandatory Fields: An error is displayed until all required fields are filled.

1.6.2 Schedule Exam

Name: Schedule Exam
Actors: Dean
Entry Conditions:

- The Dean is logged in with privileges to schedule exams.

Exit Conditions:

- The exam is scheduled with complete details (course, date, time, duration, number of proctors) and notifications are sent.

Quality Requirements:

- Conflict checks (time/room) are performed, and scheduling is completed within 3 seconds.

Main Flow:

1. The Dean navigates to the Exam Scheduling section.
2. The system prompts for exam details.
3. The Dean inputs the exam details.
4. The system validates the data and saves the schedule.
5. Notifications are sent to the relevant staff.

Exceptional Flows:

Scheduling Conflict: The system flags overlapping times or room conflicts.
Incomplete Data: An error is displayed if required fields are missing.

1.6.3 Assign Proctoring Duties

Name: Assign Proctoring Duties
Actors: Dean
Entry Conditions:

- An exam is scheduled and the Dean is logged in.

Exit Conditions:

- TAs are assigned to proctor the exam and their workloads are updated.

Quality Requirements:

- Assignment operations occur in real time with immediate notification of updates.

Main Flow:

1. The Dean navigates to the Proctoring Duties section.
2. The system displays a prioritized list of available TAs.
3. The Dean selects the TAs to assign for proctoring.
4. The system updates TA workloads and sends notifications to the selected TAs.

Exceptional Flows:

TA Unavailability: TAs on leave or with scheduling conflicts are excluded.
Insufficient TAs: The system prompts for additional TA requests or an override.

1.6.4 Determine Department Pool

Name: Determine Department Pool
Actors: Dean
Entry Conditions:

- The Dean needs to configure a cross-department proctor pool.

Exit Conditions:

- The system saves the configuration of the selected departments from which TAs can be drawn.

Quality Requirements:

- The configuration process should complete within 2 seconds.

Main Flow:

1. The Dean navigates to the Department Pool Selection section.
2. The system lists all departments.
3. The Dean selects the departments to include.
4. The configuration is saved and used for subsequent proctor assignments.

Exceptional Flows:

No Departments Selected: The system prevents proceeding without at least one department chosen.
No Available TAs: Departments with no available TAs are flagged.

1.6.5 Request Reports

Name: Request Reports
Actors: Dean
Entry Conditions:

- The Dean is logged in and requires a report (e.g., total TA workload, proctor assignments).

Exit Conditions:

- The requested report is generated and displayed or exported.

Quality Requirements:

- Report generation should complete within 5 seconds.

Main Flow:

1. The Dean navigates to the Reports section.
2. The system displays available report types.
3. The Dean applies filters (date range, course, department, etc.).
4. The system generates and displays the report.

Exceptional Flows:

No Data Found: The system displays a "No Data Found" message if the filters yield no results.

1.7 Report Management

1.7.1 Review Report Requests

Name: Review Report Requests
Actors: Admin
Entry Conditions:

- Pending report requests exist in the system.

Exit Conditions:

- Each request is either approved or rejected.

Quality Requirements:

- The review process should be efficient (each decision processed within 2 seconds).

Main Flow:

1. The Admin navigates to the Review Report Requests section.
2. The system displays all pending report requests.
3. The Admin reviews and selects "Accept" or "Reject" for each request.
4. The system processes the decision and sends a notification to the requester.

1.7.2 Generate Log Reports

Name: Generate Log Reports
Actors: Admin
Entry Conditions:

- A report request has been accepted by the Admin.

Exit Conditions:

- The system generates the log report and makes it available for download or review.

Quality Requirements:

- Log report generation must complete within 5 seconds.

Main Flow:

1. The Admin initiates log report generation.
2. The system retrieves and processes the relevant log data.
3. The log report is compiled and presented.

1.7.3 Generate Reports by Category

Name: Generate Reports by Category
Actors: Admin
Entry Conditions:

- The Admin selects a specific report category (e.g., Login, Swap, Duty, Proctor).

Exit Conditions:

- The system generates and displays the report for the selected category.

Quality Requirements:

- Filtering and report generation are executed efficiently.

Main Flow:

1. The Admin selects a report category from the available options.
2. The system gathers the corresponding data and compiles the report.
3. The report is displayed for review.

1.8 System Management

1.8.1 Update Application

Name: Update Application
Actors: Admin
Entry Conditions:

- The Admin initiates an update process.

Exit Conditions:

- The application is updated successfully or an error is reported.

Quality Requirements:

- The update process must ensure minimal downtime and data integrity.

Main Flow:

1. The Admin navigates to the Update Application section.
2. The system checks for available updates.
3. The Admin initiates the update.
4. The system deploys the updates and confirms the process.

1.8.2 Authorize Users

Name: Authorize Users
Actors: Admin
Entry Conditions:

- The Admin is logged in and needs to modify user permissions.

Exit Conditions:

- The user's authorization status is updated and changes are logged.

Quality Requirements:

- Authorization changes are processed securely and recorded accurately.

Main Flow:

1. The Admin navigates to the Authorize Users section.
2. The system displays a list of users and their current permissions.
3. The Admin selects a user and updates their permissions.
4. The system applies the changes and logs the action.

1.9 Instructor & Coordinator Workflow

1.9.1 Define Exam

Name: Define Exam
Actors: Instructor
Entry Conditions:

- The instructor is logged in.

Exit Conditions:

- The exam details are defined and saved.

Quality Requirements:

- Exam definition is validated and saved within 3 seconds.

Main Flow:

1. The instructor navigates to the Define Exam section.
2. The system prompts for exam details (date, time, format).
3. The instructor enters the necessary details.
4. The system validates and saves the exam.
5. A notification may be sent to relevant users.

Exceptional Flows:

Missing Fields: An error is displayed if required details are not provided.

1.9.2 Process TA Replacement

Name: Process TA Replacement
Actors: Coordinator, Bilkent SMTP Server (for email notifications)
Entry Conditions:

- A TA replacement request is pending.

Exit Conditions:

- The replacement request is processed (approved or rejected) and assignments are updated.

Quality Requirements:

- Replacement notifications must be sent promptly (within 1 minute).

Main Flow:

1. The coordinator navigates to the TA Replacement section.
2. The system displays pending TA replacement requests.
3. The coordinator reviews the request and available TA options.
4. Upon approval, the system updates the TA assignment and sends notification emails.

1.9.3 Process TA Leave Request

Name: Process TA Leave Request
Actors: Coordinator
Entry Conditions:

- A TA has submitted a leave request.

Exit Conditions:

- The leave request is processed (approved or rejected) and notifications are sent.

Quality Requirements:

- The decision and notification process should be completed within 1 minute.

Main Flow:

1. The coordinator navigates to the TA Leave Request section.
2. The system displays the details of the leave request.
3. The coordinator selects either “Accept” or “Reject”.
4. The system processes the decision and sends a notification to the TA.

1.9.4 Review Workload of TA

Name: Review Workload of TA
Actors: Instructor
Entry Conditions:

- The instructor is logged in.
- There is at least one TA with a submitted workload to review.

Exit Conditions:

- The instructor has either accepted or rejected the TA's workload.
- Notifications or confirmations are sent accordingly.

Quality Requirements:

- The review process should occur within 2 seconds.
- Acceptance or rejection must trigger immediate feedback to the TA.

Main Flow:

1. The instructor navigates to the "Review Workload of TA" section.
2. The system displays a list of TAs and their submitted workloads.
3. The instructor selects a TA workload to review in detail.
4. The instructor decides to accept or reject the workload.
5. The system updates the workload status and sends a notification to the TA.

Exceptional Flows:

No Workload Submitted: If no TAs have a submitted workload, the system displays a "No Workload Found" message.

Concurrent Modification: If the TA updates the workload while the instructor is reviewing it, the system warns the instructor of a possible conflict.

2 Tech Stack

We will use the following technologies in the project:

- React.js
- Spring Boot
- MySQL

2.1 React.js

React.js is a JavaScript library used for building user interfaces. It allows us to create web applications that can update and render efficiently in response to data changes. We will utilize it because it is an up-to-date frontend framework and provides various tools that facilitate an efficient and responsive user experience.

2.2 Spring Boot

Spring Boot is a Java-based framework used to create robust and scalable backend services. It simplifies application development by offering built-in features for dependency injection, security, and database connectivity. We are using it as our backend framework to ensure high performance and maintainability.

2.3 MySQL

MySQL is a widely used relational database management system (RDBMS) that offers scalability, security, and reliability. It is ideal for handling structured data and supports complex queries efficiently. We will use MySQL as the database to store and manage system records, including user data, assignments, and workload information.