



**Turkey
Karabük University
Faculty of Engineering
Computer Engineering
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SENIOR PROJECT

University Automation System

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System Sections

Lecturer Profile (Student Point of View):

- Lecturer schedule.
- Academic information.
- Courses
 - Active courses.
 - Past courses.
- Chat to communicate with students (two ways).

Lecturer Profile (Private for the Lecturer Only):

- Courses
 - Uploading notes
 - Send announcements.
 - Uploading external links.
 - Student information per course (automated from OBS).
 - Each course analytics (passed students, failed students, number of students entered the exam etc.)
- Receiving students requests and replying to them.
- Receiving messages from students.
- Senior project receiving reports weekly

Student Profile:

- Student academic information (automated from OBS)
(student schedule, exam schedule, GPA).
- Send message to lecturer.
- Send requests to lecturer (recommendation letter, exam grade objection, internship request).
- Student ranking.
- Department profile (department's lecturers, courses, top 10 students, years of department inserting under each year the related courses per each semester, president person).
- Ai Chatbot.
- Courses list.

For each course:

- Course information (automated).
- files (notes, slides, previous exams, books).
- course related announcements.

Section Details

Lecturer Profile (Private for the Lecturer Only):

- **Lecturer Schedule:** *POV: As a lecturer* You log into the system and access your private dashboard. You see your schedule for the upcoming week, which includes details of your classes, and office hours. (automated)
- **Academic Information:** *POV: As a lecturer* You navigate to your academic information section, where you can view and edit your academic background, qualifications, and research interests. This information is accessible to students who may want to learn more about your expertise.
- **Courses:** *POV: As a lecturer* you can see course analytics for each one which will show the number of students who passed, failed, entered the exam, entered the makeup exam, the average of the class. In addition to Uploaded Notes and External Links where You share lecture notes, presentation slides, or other educational resources, external web links, articles, and resources relevant to the course. Students can access and download these materials. Also, you have access to automated student information, including attendance records, grades, and contact details, which help you keep track of your students' progress. Plus, you send course-related announcements to all students in the class. These announcements can include important updates, changes in schedules, or general reminders.
 - **Active Courses:** *POV: As a lecturer* In the Courses section, you view the list of courses you are currently teaching for the semester. You can access course materials, student information, including attendance records, grades, and contact details, which help you keep track of your students' progress and other relevant details for each class. (automated)
 - **Past Courses:** *POV: As a lecturer* You review your previous semesters' courses and access important data such as course outlines, links, files, and performance statistics. (not automated)
- **Chat to Communicate with Students (Two Ways):** *POV: As a lecturer* You use the chat feature to communicate with students individually. Students can reach out to you with questions, and you can reply to them. (not automated)
- **Receiving Student Requests and Replies:** *POV: As a lecturer* You receive requests from students for recommendation letters, exam grade objections, and internship opportunities. You can review and respond to these requests through the platform. (not automated)
- **? Senior project receiving reports weekly:** the senior project student will be allowed to submit their reports weekly, and the lecturer will be notified, and the assignments are kept in the system. (not automated)

Student Profile:

- **Student Academic Information (Automated from OBS):** *POV: As a student* You access your academic profile, which includes your schedule, exam schedule, and GPA. This information helps you stay organized and monitor your academic progress. (automated)
- **Send Message to Lecturer:** *POV: As a student* You use the messaging feature to send messages to your lecturer. You can ask questions, seek clarification, or request additional support as needed. (not automated)

- **Send Requests to Lecturer (Recommendation Letter, Exam Grade Objection, Internship Request):** *POV: As a student* You send requests to your lecturer, such as requests for recommendation letters, objections to exam grades, or applications for internships. These requests are managed through the platform. (not automated)
- **Department Profile (Lecturers, Courses, Years of Department Inserting):** *POV: As a student* You explore the department's profile to learn about the lecturers, courses offered, and the top-performing students in your department. You can also view the department's history and courses offered in each semester. This information helps you make informed decisions about your academic journey. (automated)
- **Ai Chatbot:** *POV: As a student* You can see a chatbot at the bottom of the page. And can ask the bot questions that are related to the university, for example university rules and it will answer you.

These scenarios demonstrate how the platform serves both lecturers and students, facilitating effective communication and enhancing the educational experience.

Benefits of the System

For Students:

The platform offers a comprehensive set of benefits aimed at enhancing their academic journey. Through the automated Student Academic Information section, students gain easy access to their schedules, exam schedules, and GPA, providing a centralized hub for organizational purposes and continuous monitoring of their academic progress. The messaging feature allows students to communicate directly with lecturers, fostering a dynamic and interactive learning environment. Additionally, the platform facilitates the submission of various requests, including recommendation letters, exam grade objections, and internship applications, streamlining the process and ensuring efficient communication between students and lecturers. Exploring the department profile further empowers students by offering insights into lecturers, courses, and department history, aiding informed decision-making regarding their academic pursuits. The inclusion of an AI chatbot adds another layer of support, allowing students to quickly access information about university rules and guidelines.

For Lecturers:

The platform significantly simplifies administrative tasks and enhances their teaching capabilities. The automated Lecturer Schedule ensures efficient time management, providing a clear overview of upcoming classes and office hours. The Academic Information section enables lecturers to showcase their expertise, fostering transparency for students interested in their background, qualifications, and research interests. Course analytics offer valuable insights into student performance, allowing lecturers to identify areas for improvement and tailor their teaching approach. The ability to share lecture notes, presentation slides, and external resources enhances the learning experience, making educational materials easily accessible to students. The platform's automated features, such as access to student information, attendance records, and grades, facilitate streamlined monitoring of student progress. The chat feature allows personalized communication with students, fostering a supportive learning environment. Furthermore, the platform assists in managing requests, including recommendation letters and internship opportunities, streamlining the process for both lecturers and students. Overall, the platform serves as a comprehensive tool for lecturers, promoting effective communication, efficient administration, and an improved teaching and learning experience.

System Details

Login:

- Authentication
 - Username
 - Password
- Reset Password

Lecturer Side (Lecturer Pages):

1. Lecturer Sidebar:

- Profile:
 - See the profile
- Courses:
 - View the courses list the lecturer gives (With filter option to view the past semesters).
In each course page:
 - Uploading notes.
 - Add external links.
 - See course analytics (Passed students, failed students, number of students entered the exam etc.)
 - See the students list.
 - Lecture settings (Change course questions & messages preferences)
- Messages (One to one chat):
 - View the messages (Sorted by date, include search and filter options).
 - See the archived chats.
In each chat:
 - Read & reply to the message.
 - See the user profile
 - Archive the chat
 - Mute the chat.
- Requests (Student requests):
 - View the received requests (Sorted by date, include search and filter options).
For each request:
 - View & answer the request (Approve or reject with a message).

- ? Senior project groups:

- See the senior project groups.
For each group:
 - Check the reports.
 - See the group members.
 - Send a note (Request).
- Notifications:
 - View the received notifications. (The lecturer will get notifications for new messages, requests, questions, reports, system updates etc...
The notifications will be sorted by date, include search and filter options)
- Settings:
 - Change password
 - Change notification preferences
 - Change the language

1. Lecturer Navbar:

- Profile (Drop list):
 - See the profile
 - Open the settings
 - Logout
- Language:
 - Change the system language (EN - TR).
- Return home button

2. Lecturer Home Page:

- See the current courses
- See today's schedule
- Incoming notifications (messages, requests, reports, activates, etc...)

3. Lecturer Profile:

- Lecturer information (Name, picture, department).

Student Side (Student Pages):

1. Student Sidebar:

- Profile:
 - See the profile.
- Courses:
 - View the courses (With filter option to view the past semesters). For each course:
 - View lecturer profile
 - Course Information
 - See the notes & external links
 - View Student List
- Department:
 - See the department details and lectures
- ? Schedules:
 - Exam schedule
 - Lecture schedule
 - Academic schedule
- Messages:
 - View the messages. (Sorted by date, include search and filter options)
- Requests:
 - View the sent requests. (Sorted by date, include search and filter options)
- Notifications:
 - View and read the notifications. (The student will get notifications for new messages, responses, system updates etc. The notifications will be sorted by date, include search and filter options)
- Settings:
 - Change password
 - Change notification preferences
 - Change the language
 - Set a profile picture

2. Student Navbar:

- Profile (Drop list):
 - See the profile
 - Open the settings
 - Logout
- Language:
 - Change the system language (EN - TR).
- Return home button

3. Student Home Page:

- See the current courses
- See today's schedule
- Announcements

- Ai Chatbot

4. Student Profile:

- Student information (Name, picture, department).
 - All past year's info

Admin Side:

1. Login:

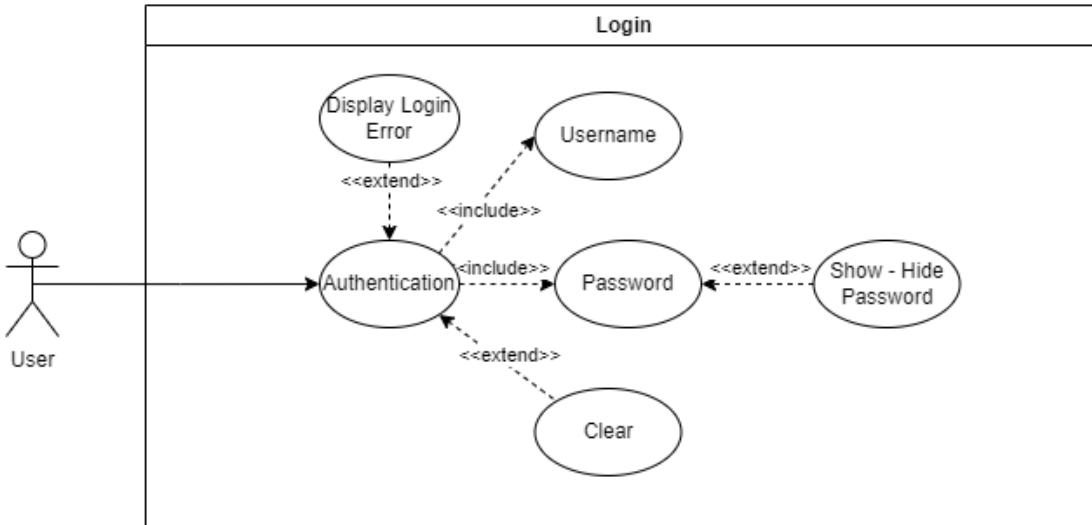
- Authentication
 - Username
 - Password
- Reset Password

2. Admin Panel:

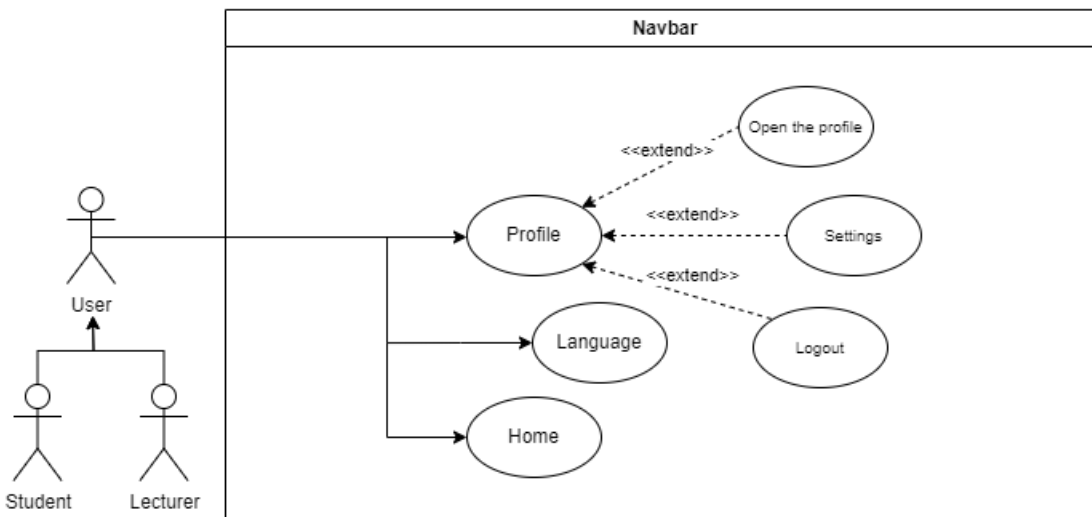
- See the Students (Students list with each student information include filter options.)
- See the Lecturers
- See the Faculties and departments
- Technical support (Complaints and Requests)
- Announcements (Send activity, system etc. announcements)

Use Case Diagrams

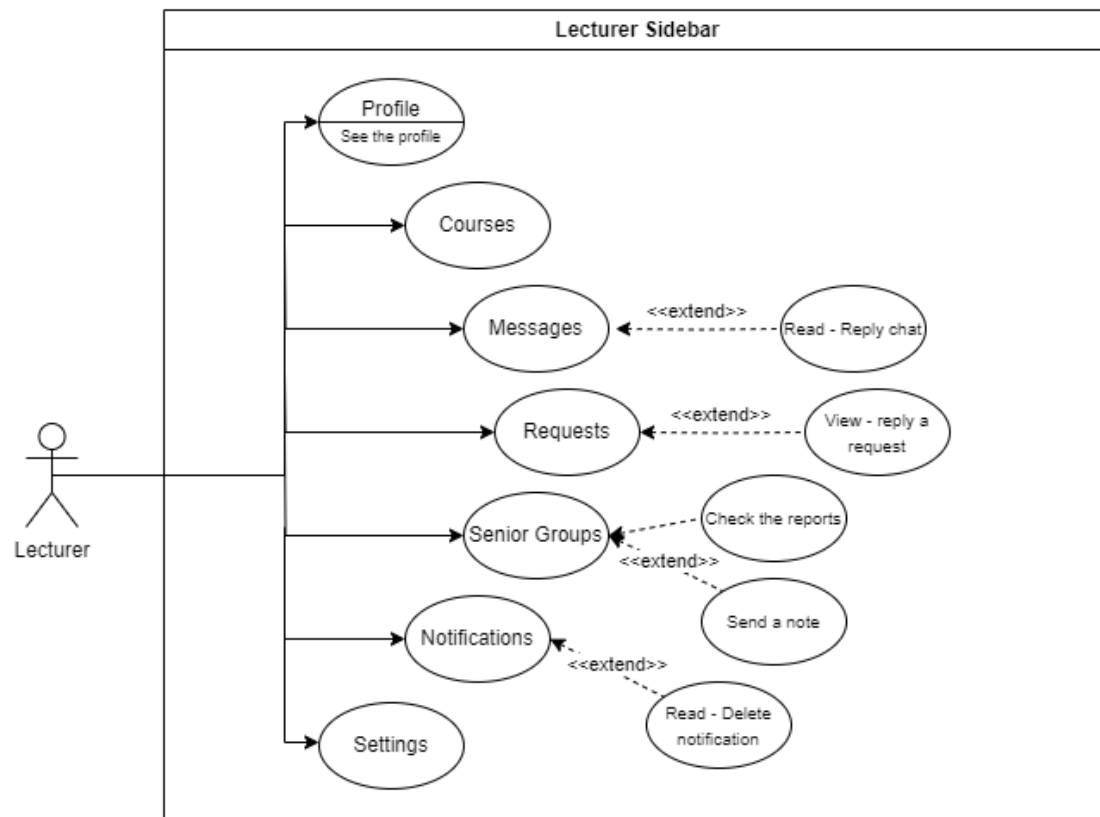
Login Page (For Users):



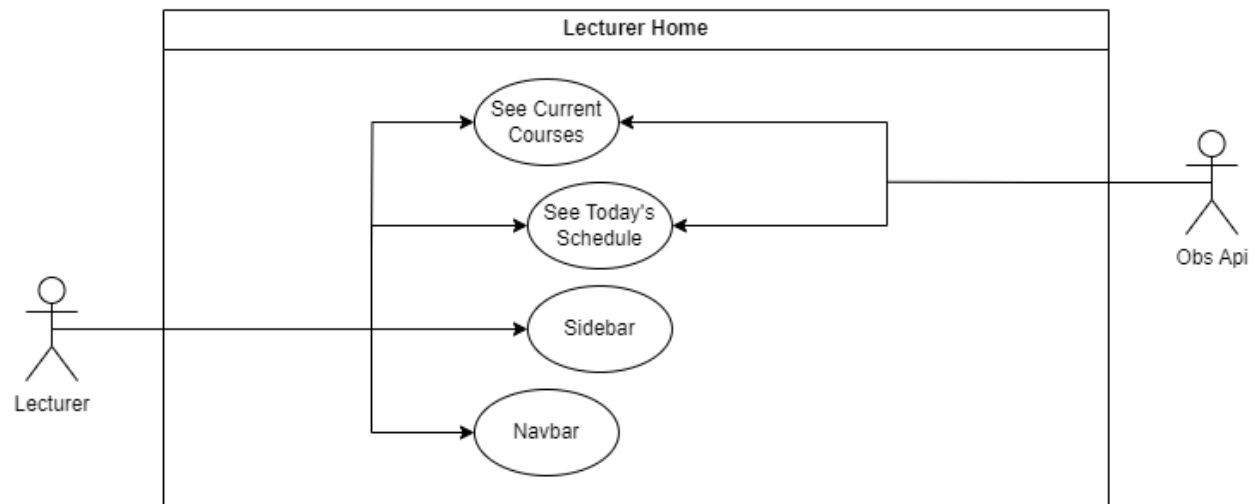
Navbar:



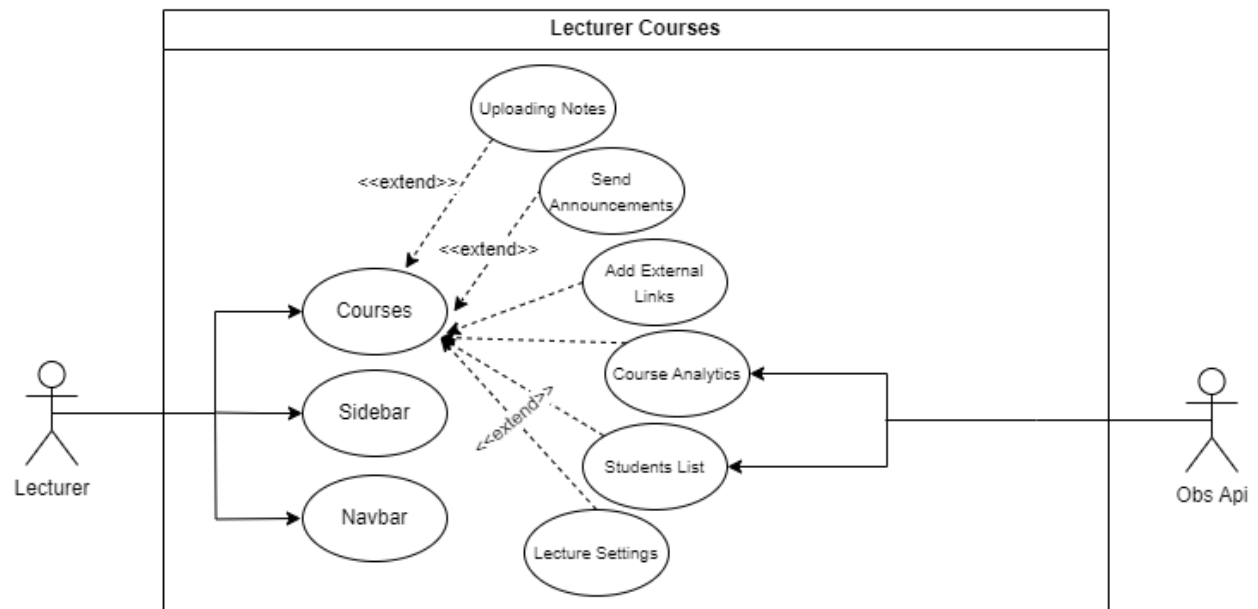
Lecturer Sidebar:



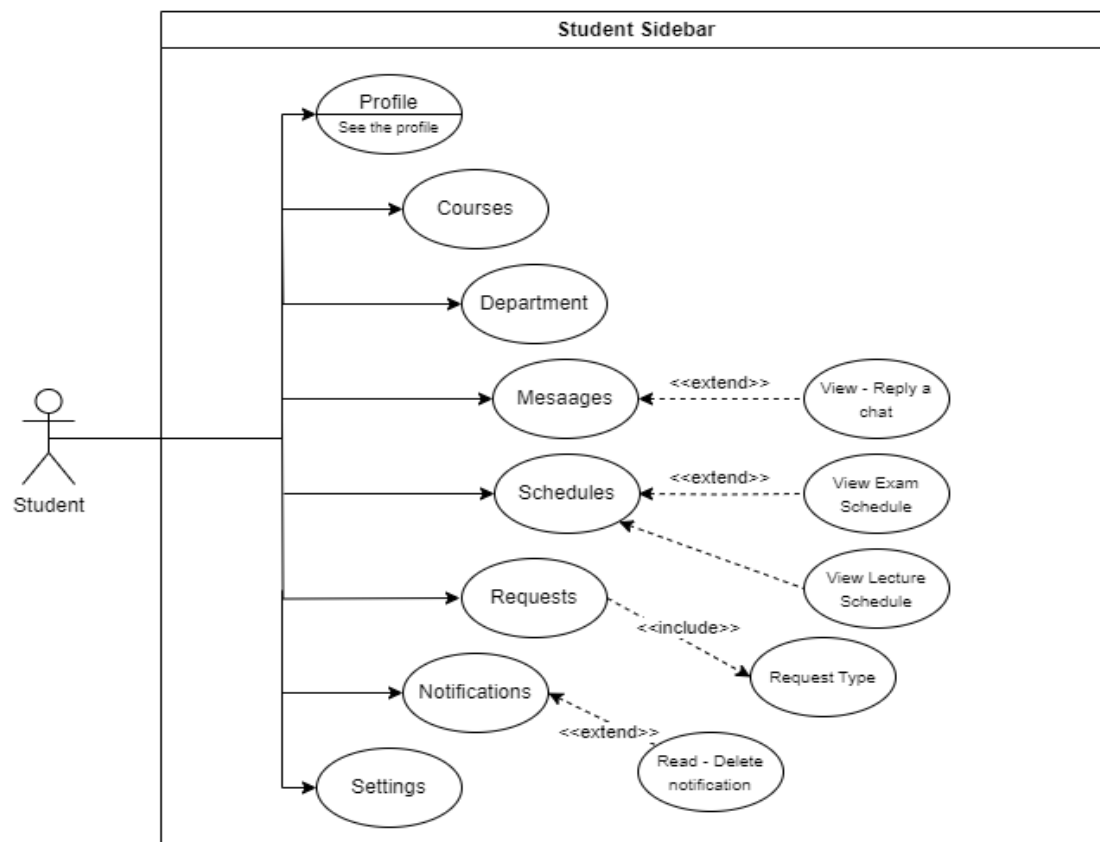
Lecturer Home:



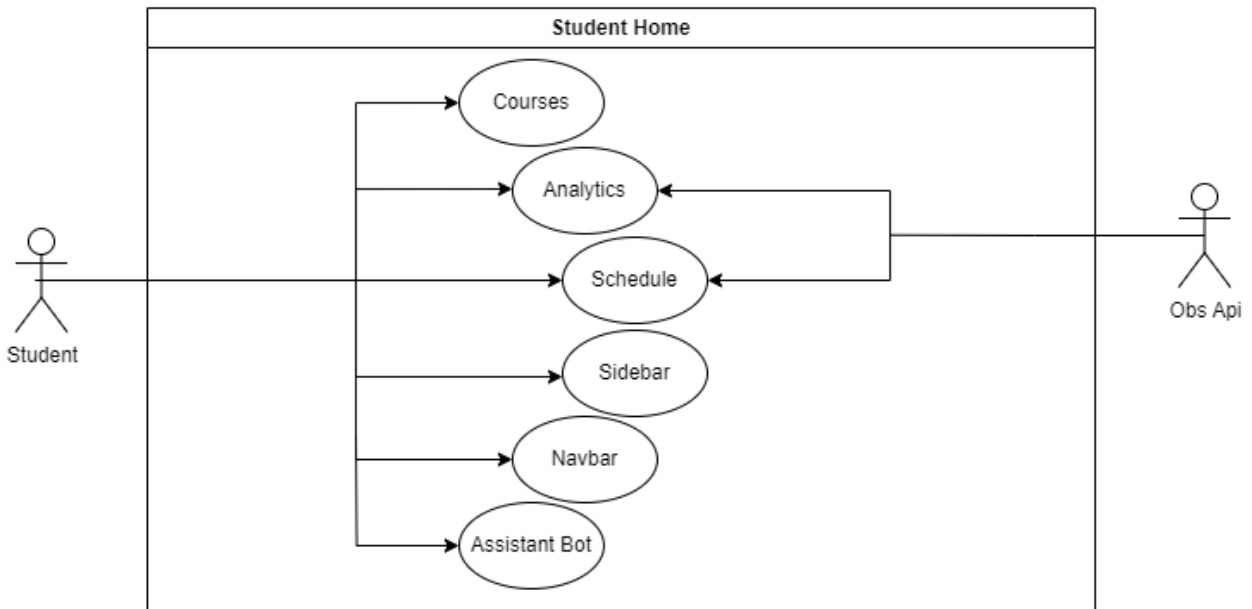
Lecturer Courses:



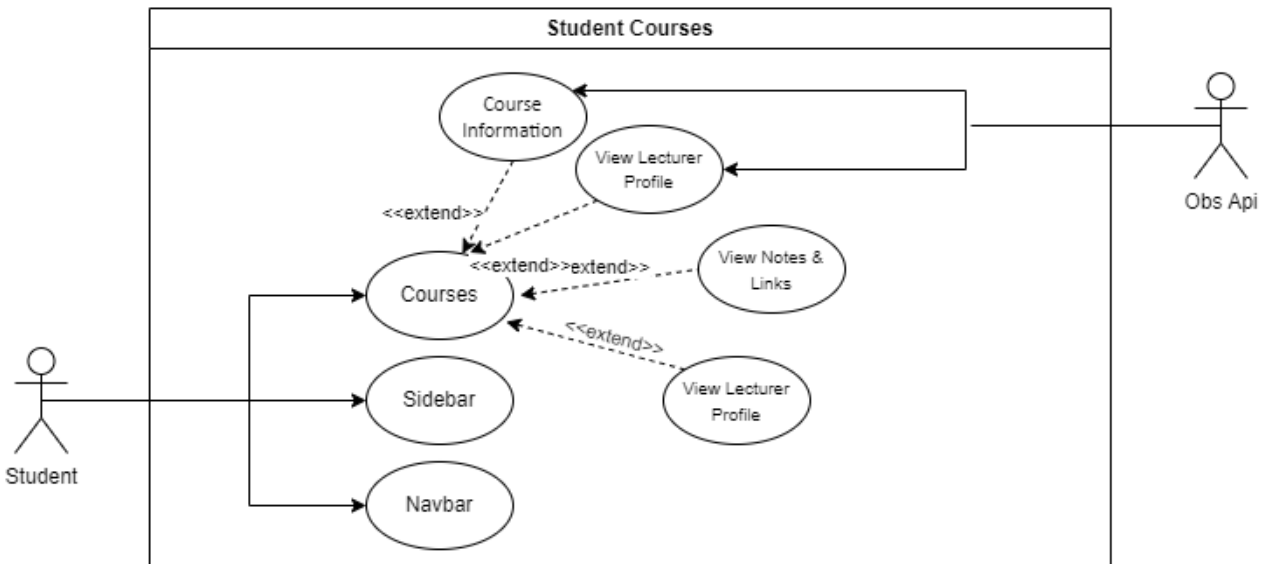
Student Sidebar:



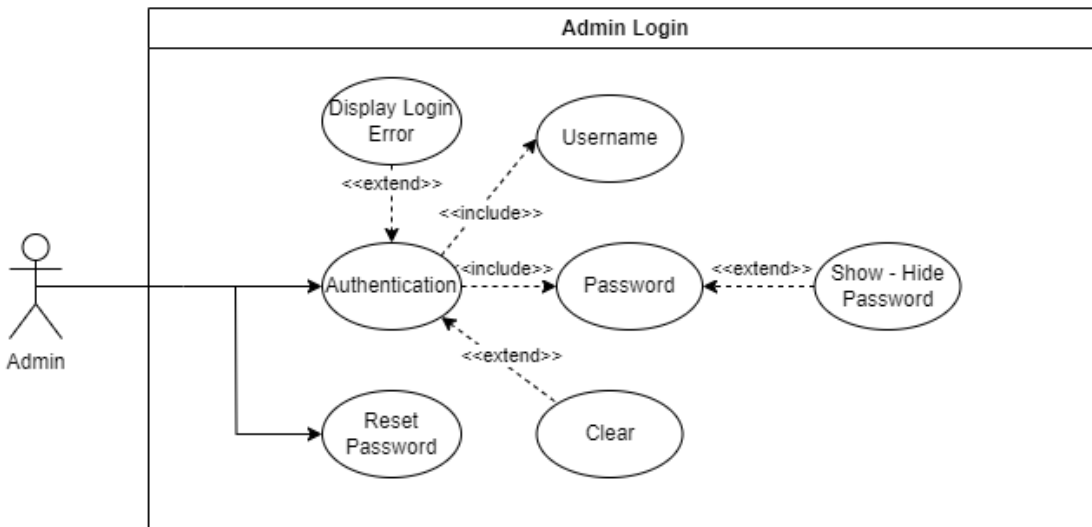
Student Home:



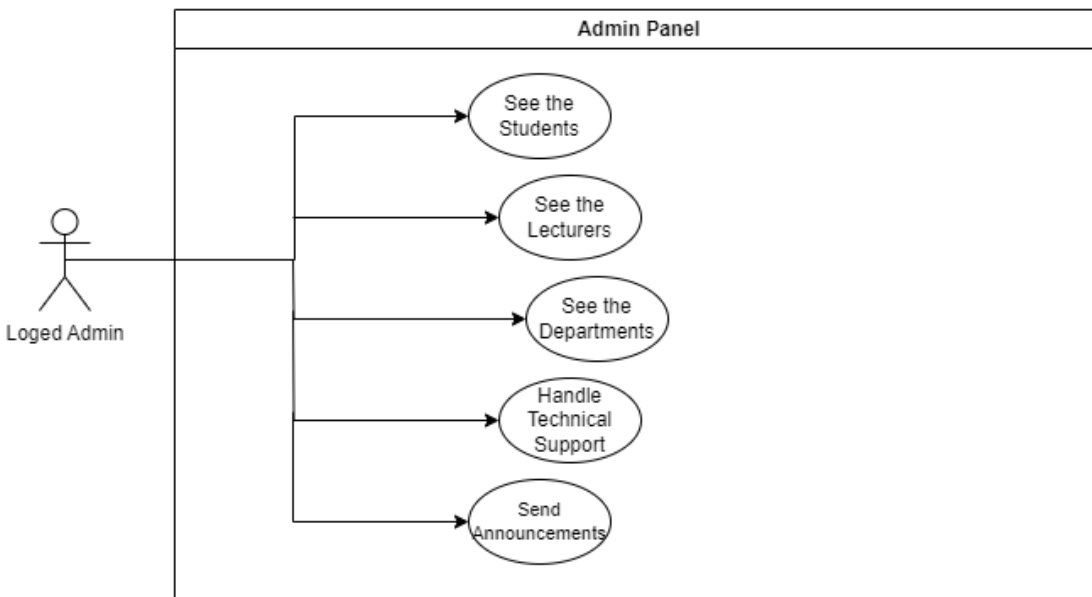
Student Courses:



Admin Login:



Admin Panel:

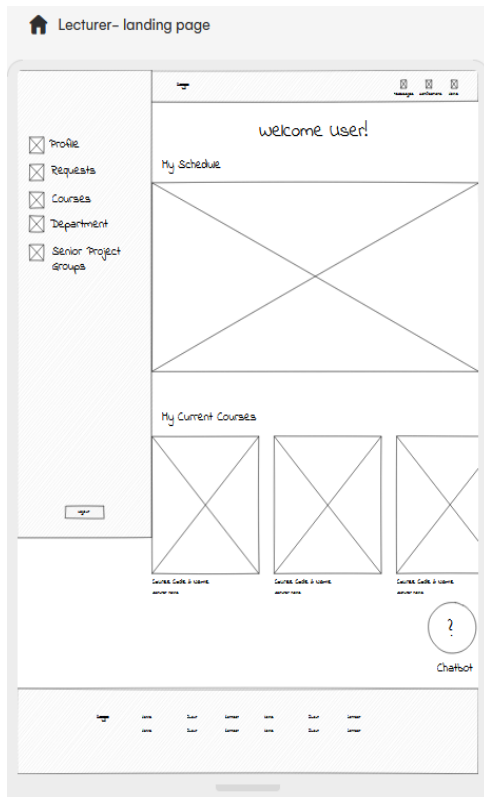
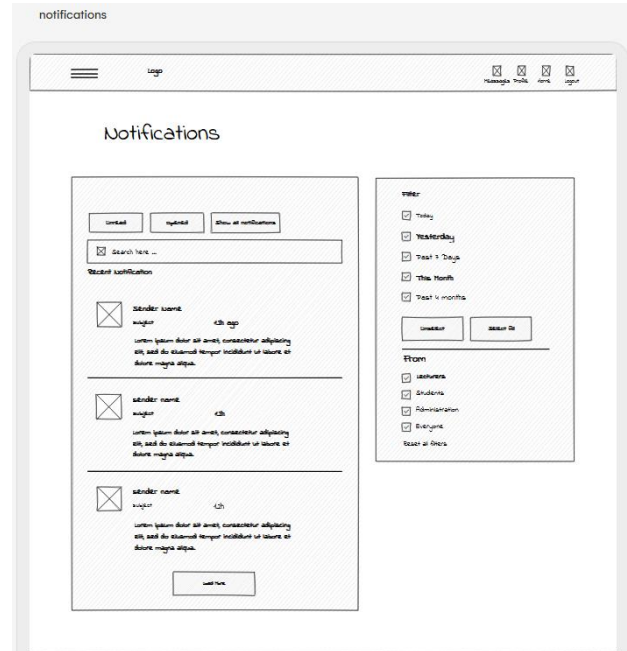
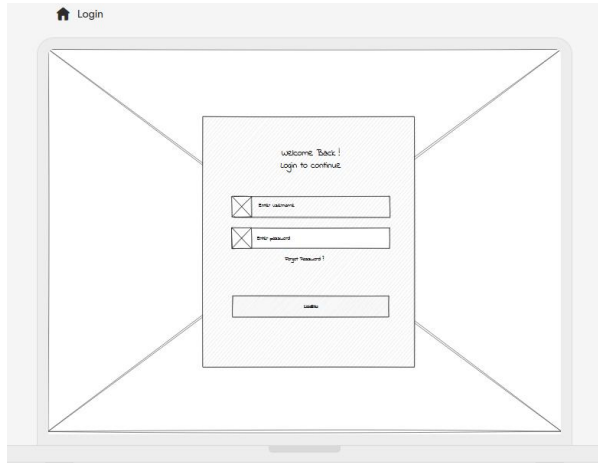


System Functionality

Database Design

User Interface Design (Low-Fidelity Wireframes)

Web Page Screens



Ai Chat Bot

Process : the chat bot will be developed in python, a Pdf loader will be used to load the pdfs that contains the rules.. After that a text splitter will be used to split each pdf contents into chunks for example (700 letters). After we will convert the Text Chunks into Embeddings and Create a FAISS Vector Store that will store the chunks in vector database. After that a template text will be prepared to guide the ai model how to deal with the prompts and the pdf files. For example :

```
template="""Use the following pieces of information to answer the user's question.
```

```
If you dont know the answer just say you don't know, don't try to make up an answer.
```

```
Context:{context}
```

```
Question:{question}
```

```
Only return the helpful answer below and nothing else
```

```
Helpful answer
```

```
"""
```

After that we will integrate a large language model such as chatgpt or llama, etc..

We will be using the model to read the pdfs from the embeddings and compare the user prompt (question) to the list of embeddings we have in the vector db. Based on that the model will use the template to know how to handle the response. So It will read and compare and answer based on the pdf contents, and not make up a response from itself.

We will be using the sin similarity algorithm to compare the embeddings to the prompt.

Code example for the process :

```
while True:
    user_input=input(f"prompt:")
    if user_input=='prompt:exit':
        print('Exiting')
        sys.exit()
    if user_input=="prompt:":
        continue
    result=chain({'query':user_input}) // will send the user prompt to the function to do the comparement
    print(f"Answer:{result['result']}") // will retrieve the answer (result) from the function
print("done")
```

Integration

The Flask web framework will be used to make an api end point for the chatbot.

An Api to get the userinput (Prompt). And use it in the process. And return the response (Answer).

Collected PDFS (Rules)

