



**ÇANKAYA UNIVERSITY FACULTY OF ENGINEERING
COMPUTER ENGINEERING DEPARTMENT**

Project Report
Version 2

CENG 408
Innovative System Design and Development II

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**Adroit System for Online Time Table and
Announcement**

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Abstract

The interaction between teachers and students is very significant in academic life. This interaction can become difficult. Especially, when the teachers are out of office. In these circumstances, teachers leave notes on their doors. These paper notes may get lost or get damaged and do not attract attention. With this project, these problems will be solved. Students will be able to check the teachers' time tables, check the published announcements and send messages via using a touchscreen. On the other hand, teachers will be able to add a new announcement and edit their time tables using a mobile application or a website. Finally, admins will verify the new registered devices and add the teachers to the database. The purpose of this project is to ease the communication and interaction between teachers and students in all circumstances, prevent paper waste and design a usable and practical real-time communication system using Raspberry Pi with a touchscreen and a motion sensor, a DBMS and a web server.

Key words:

Time Table, Announcement, Raspberry Pi, Touchscreen, Motion Sensor, DBMS, Web Server.

Özet:

Öğretmenler ve öğrenciler arasındaki etkileşim akademik hayatta çok önemlidir. Bu etkileşim zaman zaman zorlaşabilir. Özellikle, öğretmenler ofislerinde olmadıklarında. Bu şartlar altında, öğretmenler kapılarının üzerine not bırakırlar. Bu kâğıt notlar kaybolabilir veya zarar görebilir ve dikkat çekmezler. Bu proje ile bu sorunlar çözülecek. Öğrenciler, öğretmenlerin zaman çizelgelerine göz atabilir, yayınlanan duyuruları kontrol edebilir ve dokunmatik ekran kullanarak mesajlar gönderebilir. Öte yandan öğretmenler, bir mobil uygulama veya bir web sitesi kullanarak yeni bir duyuru ekleyebilir ve zaman tablolarını düzenleyebilir. Son olarak, yöneticiler yeni kayıtlı cihazları doğrulayacak ve öğretmenleri veri tabanına ekleyecektir. Bu projenin amacı, her koşulda öğretmenler ve öğrenciler arasındaki iletişimi ve etkileşimi kolaylaştırmak, kâğıt atıklarını önlemek ve bir dokunmatik ekranlı ve bir hareket sensörlü Raspberry Pi, veri tabanı ve web sunucusu kullanan kullanışlı ve pratik bir gerçek zamanlı iletişim sistemi tasarlamaktır.

Anahtar Kelimeler:

Zaman Çizelgesi, Duyuru, Raspberry Pi, Dokunmatik Ekran, Hareket Sensörü, Veri Tabanı, Web Sunucusu.

1. Introduction

1.1 Problem Statement

Students may find it difficult to interact and communicate with teachers because teachers are not always present at the school or the papers hung on the doors of the teachers can get damaged or lost. This can lead to critical announcements or updates not reaching to the students. Adroit System for Online Time Table and Announcement project will play a big role to avoid these problems.

Raspberry Pi is a very popular microcomputer. It is more powerful than the other microcontrollers and microprocessors. It is also compatible with so many different devices such as sensors, touchscreens and computers. Therefore, it is robust, easy to use and interactive. These properties of the Raspberry Pi are not enough to save energy, reduce the carbon footprint, keeping track of the data and the real-time communication.

1.2 Solution Statement

Touchscreens are very popular amongst people and companies. The usage of touchscreens increases the usability and visuality. They are also compatible with Raspberry Pi which we will use as our microcomputer. Another thing which is compatible with Raspberry Pi is the motion sensor. Motion sensor will be used for energy saving and reducing carbon footprint.

Many of the embedded systems use database. Usage of database will allow us to keep track of the data of students, teachers and admins. In this way, the data can be read or written when necessary.

With the usage of all the mentioned components this system will help both teachers and students while communicating and will solve the mentioned problems.

1.3 Motivation

We are a group of students in computer engineering department who are interested in microcomputers, embedded systems, software design and implementation. We all have taken the course of microprocessors, software engineering, database management system, object oriented programming and web development. We aim to ease the communication between teachers and students when teachers out of office, provide a better, faster and more reliable source for announcements. We have chosen Raspberry Pi as our microcontroller. With the

intention of increasing our knowledge on embedded systems, we will learn how to connect to web and database servers. For the visualization of our project we will use a touchscreen which will be connected to Raspberry Pi.

2. Literature Search

2.1 Using an Embedded System

An embedded system is a computer system that is designed for control functions in big systems. Embedded systems form the part of a device which includes hardware and software in it. Efficiency is one of the most important things for the embedded systems. Criteria like power consumption, size of the code and execute time must be optimized for cost purposes. These systems are used to help the device that they have been embedded in to control, monitor and operate. Demands of keeping track of and controlling embedded systems has largely increased in the last ten years. To match those demands, embedded systems are connected to the internet which allows reaching to those embedded systems from browsers and applications. The best way to do it is to embed a web server inside an embedded system. [1] Considering the needs of our project like connecting to a server and a database and the characteristics of embedded systems, we will use an embedded system and embedded web server in our project to enable necessary connections. When approaching embedded systems architecture design from a software engineering point of view, several models can be applied to describe the cycle of embedded system design. Most of these models are based upon one or some combination of the following development models. [2]

- The big-bang model
- The code-and-fix model
- The waterfall model
- The spiral model

Microprocessors or microcontrollers which are programmed for processing several tasks form the core of the embedded systems. We are going to use Raspberry Pi for these purposes.

2.2 Raspberry Pi

The Raspberry Pi is a small sized computer that can be used in electronics projects, and for many of the things that your desktop PC does, like spreadsheets, word processing, browsing the internet, and playing games. It also includes a HDMI inlet so, it can play high definition videos. It is created to see everyone who are interested in coding and computing use it. [3] With input and output pins that Raspberry Pi have, sending and reading data from electronic systems can be done directly. Also, using infrared, wireless and Bluetooth technologies, it can communicate with other devices easily. Raspberry Pi enables LCD touchscreen connections with Python programming languages. Considering our project which includes database connection, GUI and touchscreen interaction, with the usage of Raspberry Pi, implementing those will be easier. Also, to be able to connect sensors to Raspberry Pi via pins will be possible. There are many projects that are completed using Raspberry Pi. These projects include Making a Raspberry Pi supported computer, home automation using Raspberry Pi, operating the Raspberry Pi system using sunlight, etc.

2.3 Designing a User Interface(GUI)

For an interface to be reliable, efficient, easy to use and understandable, the user must be able to interact with it quickly and easily. At the early stages of computer screens, papers were a better way of reading and representing information than electronic screens due to the technological limitations. [4] With today's technology, those limitations are no longer active so; electronic screens with user interfaces are the best way to display information. With these developments, paper waste is prevented. Our user interfaces on the touchscreen, mobile application and web page will be implemented considering the qualities of an efficient interface.

2.4 Using a Touchscreen

It is so common for a technological device such as cameras, mobile phones, remote controls, display screens etc. to have a touchscreen nowadays. Touch screens are popular because they enable a dynamic interaction by combining display and input functions and therefore eliminating buttons and switches. Touchscreens allows users to act more directly with the screen by touching, pushing, dragging. This direct interaction results into easier use, better user experience and acceptance and a faster input implementation. [5] To provide our users a better, easier interaction and usage, a touchscreen with a user interface will be implemented and connected to Raspberry Pi. This will allow users to adapt and use that system more easily and in a better and efficient way.

2.5 Motion Sensor

All live beings spread energy to the environment they are present at that moment with infrared waves. Those waves cannot be seen by human eye, but it can be detected by the usage of a sensor. PIR (Passive infrared) sensor can be used to detect these energy spreads. When a human or an animal spreading an energy with infrared waves passes through the field of view of the sensor, the sensor detects the change in temperature and therefore can be used to detect motion. [6] Motion sensors are easy to use, small, hard to wear out and cheap. Because of all these reasons, those sensors are very popular and common. They can be referred differently as PIR, "Passive Infrared", "Pyroelectric", or "IR motion" sensors. [7] To preserve the battery power of our components and to reduce the carbon footprint, a motion sensor which will be connected to Raspberry Pi will be used. The circuit is very simple for this and does not even need to connect to a breadboard. [8] The details of the sensor can be seen in Figure 1 and Figure 2.

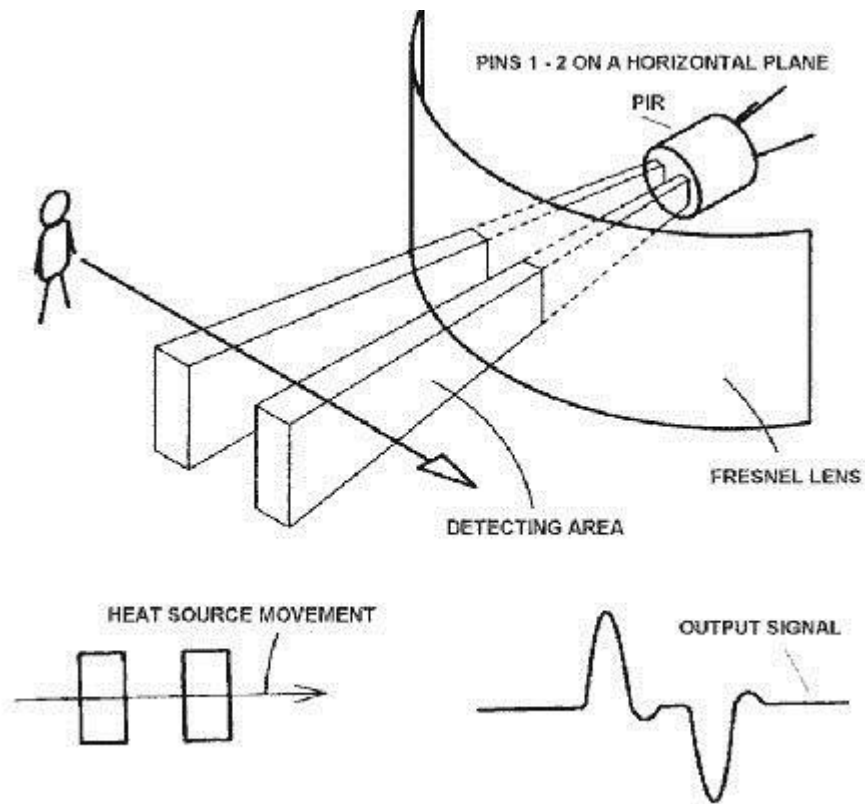


Figure 1: Motion Sensor Working Schema

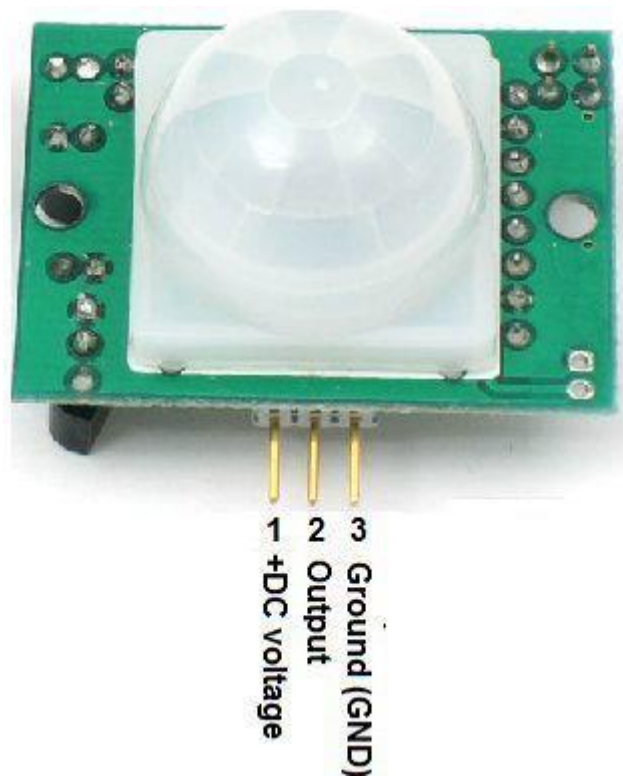


Figure 2: Motion Sensor

2.6 Using Timetable

In our project, we are going to use timetable for announcement part. In this way, announcements and schedules of instructors will be displayed on the screen. Each instructor will be able to connect to their screen and add their lectures, messages and announcements via a mobile application. A database system will be developed to store those kinds of information.

2.7 Designing and Implementing a Database

With the growth use of computers, usage of database systems increased dramatically. Nowadays, databases are used in nearly every computational system as a critical element. To keep track of instructors, their lectures, office hours, announcements and messages, a database will be implemented in our project. To enable real time data storage and communication, this database will be connected to a server. To establish that real time connection, the user interface programs and application programs that run on the client side requires an access to the DBMS (Database Management System). The program establishes a connection to the DBMS (which is on the server side); once the connection is created, our user interface program will be ready to communicate with the DBMS. [9]

2.8 Information Pull and Push

Increased number of sales of wireless devices and with the ability to track and record user information, how the information will be pushed and pulled became a major concern. Users may be given so much information that they didn't want to receive or see. To prevent this, an information distribution method can be used. The method used is "PUSH" or "PULL". To define these terms:

- PULL: Information flow that is expected by the user;
- PUSH: Information flow that will be displayed and sent to the user. [10]

With the usage of a wireless network and a database in our project, it is important to send and get data to and from the database. With the help of this method, information can be get from and sent to the user in a flowing and non-disturbing way.

3. Summary

3.1 Technology Used

Raspberry pi is used to visualize the project and it will be the microcomputer of the project. Procedures of designing a GUI, displaying the interfaces to the users, connecting to the database and web servers will be done on Raspberry Pi. Raspberry Pi is a microcomputer that is capable of doing what a desktop PC does, and it enables connections with other devices. There are many programming languages and applications that can be used within or with Raspberry Pi. These properties of Raspberry Pi make it practical, robust and easy to use and implement. Because of all these reasons, Raspberry Pi is the most suitable technology for our project.

For the displaying of the interfaces to the users, there will be three different technologies used: Touchscreen, mobile application, website and motion sensor.

Touchscreens are popular technological devices for displaying and dynamic interaction. This dynamic interaction will provide the users a better user experience and a faster input implementation.

The mobile application will be developed for Android platform and it will be in use for teachers.

The website will be developed using ASP.NET which is the most popular web development technology. The website will be implemented for the use of teachers and admins. Every electronic device has a carbon footprint. To reduce our devices' carbon footprints, a motion sensor will be implemented. Motion sensors are easy to use, small, hard to wear out and cheap. Because of all these reasons, those sensors are very popular and common. Also, Raspberry Pi allows the implementations of motion sensors. Using this feature of Raspberry Pi will allow us to easily implement the motion sensor to the project.

4. Software Requirements Specification

4.1 Introduction

4.1.1 Purpose

The purpose of this document is describing the project which is called Adroit System for Online Time Table and Announcement. This project aims to update the schedule actively and display sudden announcements without losing time, eliminate the difficulty of updating the currently-used schedule tables, eliminate the risk of papers hung on the door getting damaged, prevent paper waste and ease the communication and interaction between teachers and students.

This document includes detailed information about requirements of the project. It reflects the identified constraints and proposed software functionalities. Moreover, the SRS document explains how teachers and students interact with the project. This document explains how concerns of the stakeholders are met.

4.1.2 Scope of Project

Most of the students have difficulty in reaching teachers outside of the lectures and announcements and time tables of teachers hung on their doors can easily be damaged and they are hard to update. Because of these reasons, the interaction between teachers and students may become difficult. In addition to this, at any time, a sudden update on a teacher's time table or condition may appear and it may not reach to the students in time. This project can solve these problems with real time interaction between the teacher and the touchscreen via a website or mobile application.

The purpose of Adroit System for Online Time Table and Announcement Project is to design a system with a touchscreen and a mobile application which will include a GUI that will enable the tracing of schedules and announcement. To increase the level of usability and practicability, Raspberry Pi and a Touchscreen will be used. These two components can be connected easily to each other and because of the Raspberry Pi's functionality which allows users to use different kind of programming languages, a GUI can be implemented and displayed on the touchscreen for the use of students.

For the use of teachers, a mobile application and a website will be implemented to allow teachers to perform specific actions.

For the use of admins, a website will be implemented to allow admins to perform specific actions.

4.2 Overall Description

4.2.1 Product Perspective

Adroit System for Online Time Table and Announcement is a real-time communication and an informative project that aims to replace the current paper-based announcement and time table methods. Another objective is to ease the communication between the teachers and students by using real-time communication. There will be different interfaces for students and teachers.

On students' side, they will only be able to interact with the touchscreen. They will be able to send messages to the teacher by using already determined message templates to avoid objectionable content, see the teacher's time table, announcements and if published.

On teachers' side, by using the Wi-Fi connection between Raspberry Pi and their PC or mobile application, they will be able to make changes to their time table such as adding meetings, office hours, rendezvous for meeting students, publishing new announcements. To be able to do all these actions, teachers must login to their pre-determined accounts. These accounts will be created to prevent students using those abilities.

4.2.2 User Classes and Characteristics

4.2.2.1 Student

- Students must be studying in Çankaya University.
- Student must be able to read and understand the English language since the touchscreen will be in English language.
- Student must have the knowledge for how to use a touchscreen.

4.2.2.2 Teacher

- Teacher must be a teacher in Cankaya University.
- Teacher must be able to read and understand the English language since the interface for teachers will be in English language.
- Teacher must know how to use a computer.
- Teacher must know how to use a mobile application

4.2.2.3 Admin

- Admin must be an employee in Çankaya University.
- Admin must know how to use a database.
- Admin must know how to use a computer

4.2.3 Operating Environment

This project will run on Raspberry Pi and a touchscreen which will be connected to each other. Python programming language will be used to design and implement a user interface. On the database side, MySQL will be used to design and implement the

necessary entities, tables and relations. The touchscreen will be hung on the teacher's door. Apart from that, the mobile application will run on Android Platform.

4.3 External Interface Requirements

4.3.1 User Interfaces

The interface of the touchscreen will include teacher's time table, buttons and menu transitions which the student will be able to navigate through.

4.3.2 Hardware Interfaces

The project requires a Raspberry Pi and touchscreen. It also requires necessary cable connections between Raspberry Pi and touchscreen to enable visualization.

4.3.3 Software Interfaces

A database connection is required to read/write data about teachers, their time tables, announcements and messages.

4.4 System Features

4.4.1 Functional Requirements

4.4.1.1 Website Use Case

- Login as Teacher
- Edit Time Table
- Check Announcements
- Edit an Announcement
- Publish an Announcement
- Check Emails
- Send an Email
- Login as Admin
- Add a Teacher to the Database
- Verify the Device
- Logout

4.3.1.1.1 Diagram

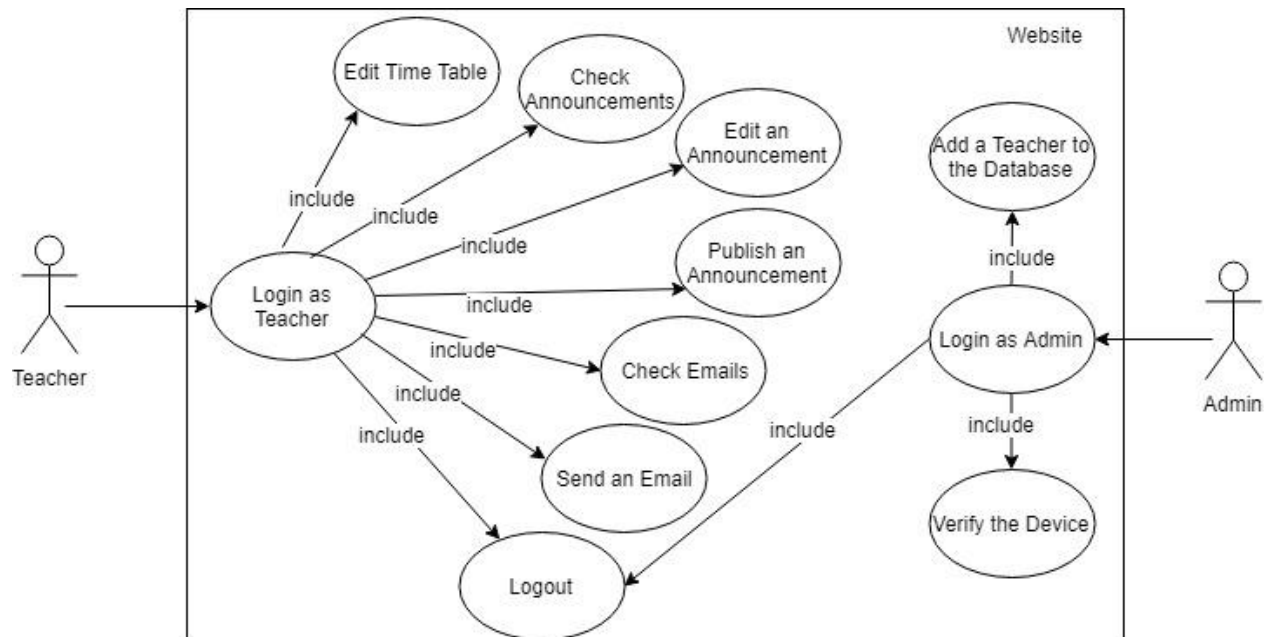


Figure 3: Website Use Case

4.3.1.1.2 Brief Description

- **Login as Teacher:** Teacher should login to his/her account before performing any actions.
- **Edit Time Table:** After the login, the teacher can modify his/her time table.
- **Check Announcements:** After the login, the teacher can check all announcements.
- **Edit an Announcement:** After the login, the teacher can edit any announcement.
- **Publish an Announcement:** After the login, the teacher can publish a new announcement.
- **Check Emails:** After the login, the teacher can check the received emails.
- **Send an Email:** After the login, the teacher can reply any received emails.
- **Login as Admin:** Admin should login to his/her account before performing any actions.
- **Verify the Device:** After the login, the admin can verify a newly registered device.
- **Add a Teacher to the Database:** After the login, the admin can add a teacher to the database.
- **Logout:** Teacher or Admin can logout any time after login.

4.4.1.1.3 Initial Step by Step Description:

1. Login as Teacher

1.1. Teacher shall login to the system using e-mail address and password.

1.1.1. If the password is invalid for the e-mail address, error message is displayed under the login button for 5 seconds.

1.1.2. If the login is successful, teacher is redirected to the actions menu in a second.

2. Edit Time Table

2.1. Teacher shall modify his/her time table.

2.1.1. The teacher shall add a new meeting or an additional course to his/her time table which is displayed in the middle of the screen.

2.1.2. The teacher shall remove an existing course or meeting from his/her time table which is displayed in the middle of the screen.

3. Check Announcements

3.1. Teacher shall check all published announcements.

3.1.1. If there are no announcements, a message will be displayed in the middle of the screen.

4. Edit an Announcement

4.1. Teacher shall modify his/her published announcements.

4.1.1. The teacher shall update his/her published announcement information.

4.1.2. The teacher shall remove his/her published announcement.

5. Publish an Announcement

5.1. The teacher shall publish a new announcement which will be on display for a period of time that the teacher chose.

6. Check Emails

6.1. The Teacher shall check the received emails which will be refreshed every 10 seconds.

6.1.1. If there are no emails, a message will be displayed in the middle of the screen.

7. Send an Email

7.1. Teacher shall reply any emails sent by the students.

8. Login as Admin

8.1. Admin shall login to the system using e-mail address and password.

8.1.1. If the password is invalid for the e-mail address, error message is displayed under the login button for 5 seconds.

8.1.2. If the login is successful, admin is redirected to the actions menu in a second.

9. Verify the Device

9.1. The admin shall verify a newly registered device which will be verify for a term.

10. Add a Teacher to the Database

10.1. The admin shall add a teacher to the database who will be active for one term.

11. Logout

11.1. Admin and Teacher shall exit from the system.

11.1.1. A message will be displayed for 3 seconds to show the logout is successful.

4.4.1.2 Mobile Application Use Case

- Login
- Edit Time Table
- Check Emails
- Send an Email
- Publish an Announcement
- Edit Announcements
- Check Announcements
- Logout

4.4.1.2.1 Diagram

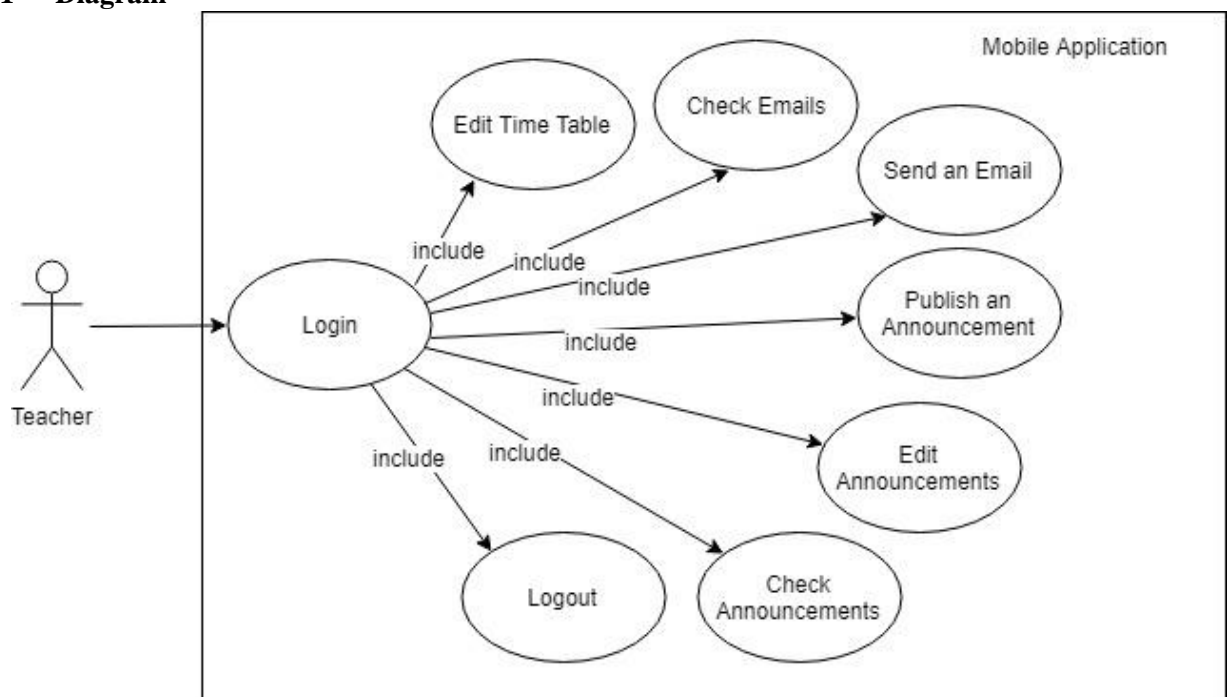


Figure 4: Mobile Application Use Case

4.4.1.2.2 Brief Description

- **Login:** Teacher should login to his/her account before performing any actions.
- **Edit Time Table:** After the login, the teacher can modify his/her time table.
- **Check Emails:** After the login, the teacher can check the received emails from students.
- **Send an Email:** After the login, the teacher can reply any received emails.
- **Publish an Announcement:** After the login, the teacher can publish a new announcement.
- **Edit Announcements:** After the login, the teacher can edit any announcement.
- **Check Announcements:** After the login, the teacher can check all announcements.
- **Logout:** Teacher or Admin can logout any time after login.

4.4.1.2.3 Initial Step by Step Description

4.4.1.2.3.1 Login

4.4.1.2.3.1.1 Teacher shall login to the system using e-mail address and password.

4.4.1.2.3.1.1.1 If the password is invalid for the e-mail address, error message is displayed under the login button for 5 seconds.

4.4.1.2.3.1.1.2 If the login is successful, teacher is redirected to the actions menu in a second.

4.4.1.2.3.2 Edit Time Table

4.4.1.2.3.2.1 Teacher shall modify his/her time table.

4.4.1.2.3.2.1.1 The teacher shall add a new meeting or an additional course to his/her time table which is displayed in the middle of the screen.

4.4.1.2.3.2.1.2 The teacher shall remove an existing course or meeting from his/her time table which is displayed in the middle of the screen.

4.4.1.2.3.3 Check Emails

4.4.1.2.3.3.1 The Teacher shall check the received emails which will be refreshed every 10 seconds.

4.4.1.2.3.3.1.1 If there are no emails, a message will be displayed in the middle of the screen.

4.4.1.2.3.4 Send an Email

4.4.1.2.3.4.1 Teacher shall reply any emails sent by the students.

4.4.1.2.3.4.1.1 After filling the email content textbox, the teacher shall click on the send button.

4.4.1.2.3.4.1.2 If the email cannot be sent in 5 seconds, a message will be displayed on the screen.

4.4.1.2.3.5 Publish an Announcement

4.4.1.2.3.5.1 The teacher shall publish a new announcement which will be on display for a period of time that the teacher chose.

4.4.1.2.3.6 Check Announcements

4.4.1.2.3.6.1 Teacher shall check all published announcements.

4.4.1.2.3.6.1.1 If there are no announcements, a message will be displayed in the middle of the screen.

4.4.1.2.3.7 Edit an Announcement

4.4.1.2.3.7.1 Teacher shall modify his/her published announcements.

4.4.1.2.3.7.1.1 The teacher shall update his/her published announcement information.

4.4.1.2.3.7.1.2 The teacher shall remove his/her published announcement.

4.4.1.2.3.8 Logout

4.4.1.2.3.8.1 Teacher shall exit from the system.

4.4.1.2.3.8.1.1 A message will be displayed for 3 seconds to show the logout is successful.

4.4.1.3 Touchscreen Use Case

- Check Announcements
- Check the Teacher's Timetable
- Send an Email
- Fill the Email Address
- Take a Picture
- Navigate Between the Menus

4.4.1.3.1 Diagram

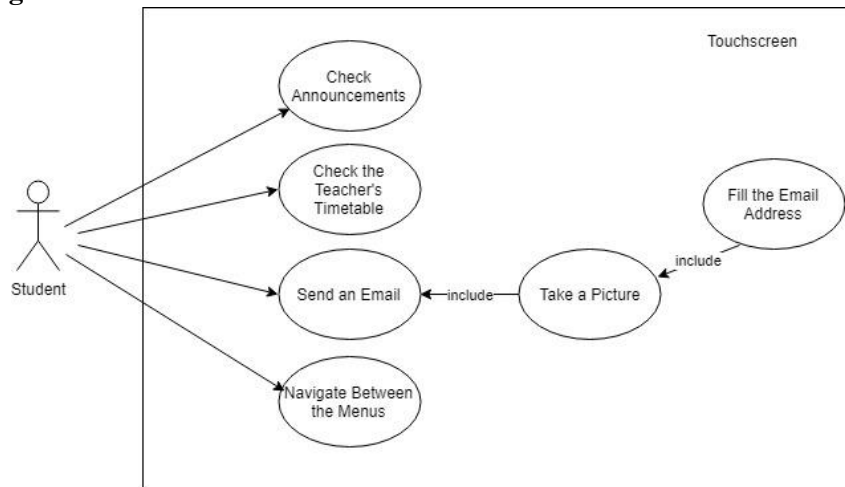


Figure 5: Touchscreen Use Case

4.4.1.3.2 Brief Description

4.4.1.3.2.1 **Check Announcements:** Students can check published announcements by the teacher.

4.4.1.3.2.2 **Fill the Email Address:** To be able to send a message, the student must enter his/her e- mail address.

4.4.1.3.2.3 **Check the Teacher's Timetable:** Student can check teacher's timetable.

4.4.1.3.2.4 **Send an Email:** Students can send messages to teachers using already determined message templates.

4.4.1.3.2.5 **Take a Picture:** After filling the email address, the student must confirm to take his/her photograph for sending an email.

4.4.1.3.2.6 **Navigate Between the Menus:** The student can navigate between different menus to perform different actions.

4.4.1.3.3 Initial Step by Step Description

1. Check Announcements

1.1. Student shall check the announcements published by the teacher.

1.1.1. If there are no announcements, a message will be displayed in the middle of the screen.

2. Fill the Email Address

2.1. Student shall fill the textbox placed in the top-left corner of the screen with his/her email address.

3. Check the Teacher's Timetable

3.1. Student shall check teacher's timetable.

4. Send an Email

4.1. Student shall send a message to the teacher.

4.1.1. If the filled email address is invalid, an error message will be displayed under the textbox for 5 seconds.

4.1.2. The student shall choose one of the already determined message templates to send it to the teacher.

5. Take a Picture

5.1. Student shall take a picture in front of touchscreen.

5.1.1. After filling the email address, the student must confirm to take his/her photograph for sending an email in 5 seconds.

6. Navigate Between the Menus

6.1. Student shall change the pages by using the right and left arrows placed on the right and left-hand sides of the screen.

4.4.2 Performance Requirements

The touchscreen's response time must be immediate to increase usability. Also, the connections between Raspberry Pi, touchscreen, database server, webpage and web servers must be smooth without any latency to prevent the loss of data and keep the flow of usage going.

4.4.3 Security Requirements

The messages which will be sent to the teacher will only include templates determined by the admin to prevent inappropriate messages. To be able to send a message to the teacher, the student must enter his/her e-mail and password before sending an e-mail.

4.4.4 Software Quality Attributes

4.4.4.1 Adaptability

Since there will be three different roles for this project, the system will adapt itself for the use of those different roles by asking for approvals.

4.4.4.2 Portability

- Adroit System for Online Time Table and Announcement is implemented using Raspberry Pi.
- The project can mainly be used with Raspberry Pi but other microcomputers or microprocessors like Arduino can also be used for implementing this project.

4.4.4.3 Usability

- There are 3 different user roles that can use this system.
- Teachers have 3 different actions to perform which requires a login operation.
 - Edit Timetable.
 - Publish announcements.
 - Check received messages.
- Students have 3 different actions to perform.
 - Send a message to the teacher which requires an authentication with e-mail and password.
 - Check announcements.
 - Navigate between the menus using the touchscreen.
- Admins have 2 different actions to perform which requires a login operation.
 - Add a teacher to the database.
 - Verify a newly registered device.

5. Software Design Description

5.1 Introduction

5.1.1 Purpose

The purpose of this Software Design Document is providing the details of project Adroit System for Online Time Table and Announcement how and when it can be used, information about their components and how they operate, used techniques and why they were used are discussed and specified.

The expected audience is teachers of Computer Engineering Department of Çankaya University and all the students in Çankaya University. We aim to provide a real-time communication environment which enables an easier communication between teachers and students.

The purpose of this project is to update the schedule actively and display sudden announcements without losing time, eliminate the difficulty of updating the currently-used schedule tables, eliminate the risk of papers hung on the door getting damaged, prevent paper waste and ease the communication and interaction between teachers and students.

In order to provide a better comprehension, this SDD includes various diagrams such as UML diagram of the project, activity diagram and block diagram.

5.1.2 Scope

This document contains a complete description of the design of Adroit System for Online Time Table and Announcement.

In the architecture, a touchscreen will be connected to a touchscreen to design a GUI using Python. Python is an object-oriented programming language that allows developers to design an easy to use and modern GUI with its functions.

A website will be implemented for the use of teachers and admins which will be designed using ASP.NET. ASP.NET is a server-side web development language. With ASP.NET language apart from static pages, dynamic web pages can also be implemented. In the ASP.NET, there is not always request to the server so, it is more secure and fast.

The database connection will be enabled using MySQL for all the components. Also, all the entities, tables and relations will be available at Digital Ocean Server Platform for remote access. Moreover, a mobile application will be developed for Android platform.

Raspberry Pi will be used which is used by many developers because of its functionality,

usability and robustness. There are various programming languages that can be used within Raspberry Pi. It is also a great source for designing a user interface and connection with a touchscreen. Furthermore, it can be programmed in Linux, Windows and Mac OS.

For the tracking of the data MySQL will be used as DBMS. A DBMS is a software that defines, creates, uses and changes the databases. MySQL is one of the most popular database management system in the world. With MySQL, data can be managed in different ways and complicated results can be returned using stored procedures. So, desired data can be obtained.

5.1.3 Glossary

Table 1: Glossary of SDD

| Term | Definition |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| BLOCK DIAGRAM | The type of schema which the components in the system are displayed in blocks. |
| TOUCHSCREEN | It is a display and an input device. Its screen is sensitive to the pressure so; inputs are taken by touching the buttons on the screen. |
| RASPBERRY PI | It is a credit-card sized computer which includes audio, video, LAN, USB and HDMI ports and it can be connected to multiple hardware devices such as touchscreens. [1] |
| STAKEHOLDERS | Any person who has contribution in the project. |
| SDD | Software Design Document. |
| UML DIAGRAM | It is a modelling language which is used in Software Engineering. |

5.1.4 References

[1].Watkiss, S. (2016). Learn electronics with Raspberry Pi. 7th ed. United Kingdom: Apress, p.92.

5.1.5 Overview of Document

The remaining chapters and their contents are listed below.

Section 5.2 is the Architectural Design which describes the project development phase. Also, it contains class diagram of the system and architecture design of the project which describes users' functions and variables. Additionally, this section includes activity diagram of Touchscreen Usage.

Section 5.3 is Use Case Realization. In this section, a block diagram of the system, which is designed according to use cases in SRS document, is displayed and explained.

Section 5.4 is Human Interface Design. In this section, we have shown user interfaces of the components of the project.

5.2 Architecture Design

5.2.1 Simulation Design Approach

5.2.1.1 Class Diagram

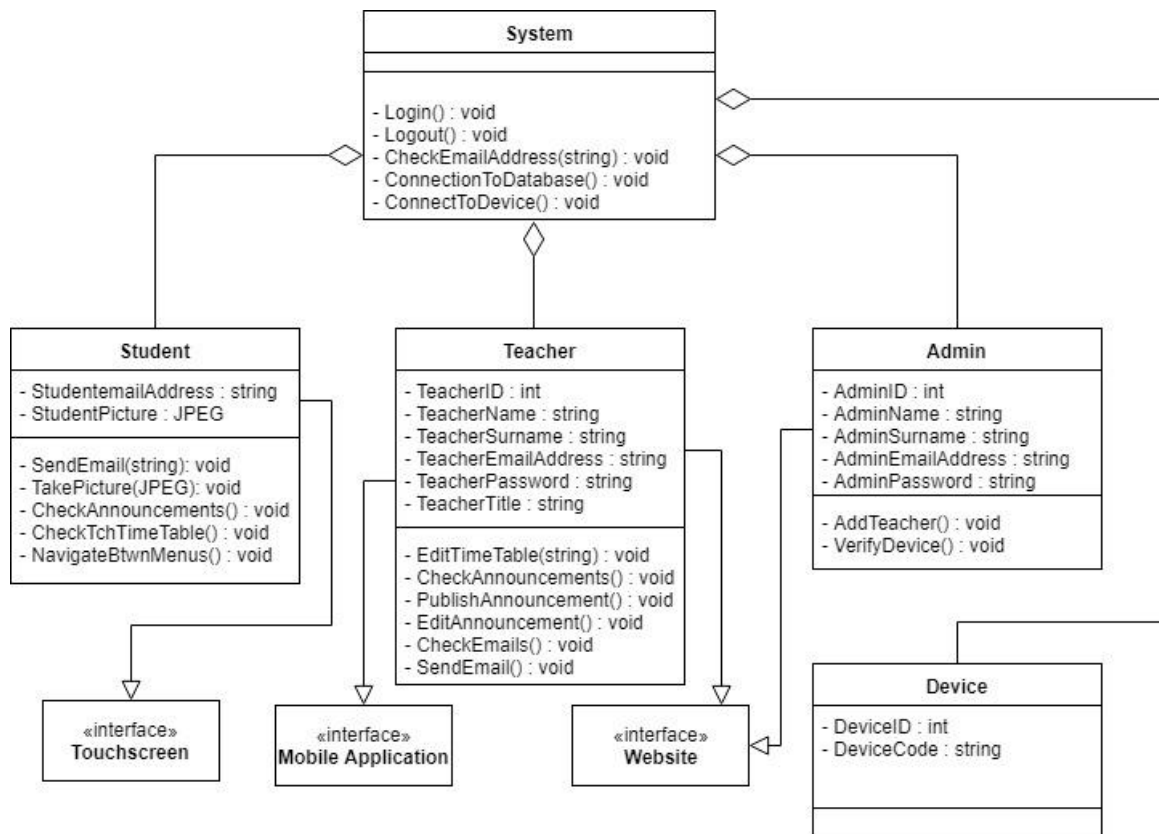


Figure 6: Class Diagram of the Project

Figure 6 displays information about connections between the systems within the project. System Class is the main system function which contains other systems. It is responsible for connections between other systems such as Admin, Teacher, Student and Device. Admin class represents the admins who use the system. Teacher class is for the registered teachers that use the Mobile Application and Website interfaces of the system. Student class is for the Çankaya University students that use Touchscreen interface of the system. Device class is for the registered devices in the Computer Engineering Department.

5.2.2 Architecture Design of Project

5.2.2.1 Profile Management

Summary: This system is used by teachers, students and admins. Teachers can login to their accounts using the system. In addition to this, admins can add a new teacher or a course and verify a newly registered device.

Actor: Teacher, admin

Precondition: User must run the website or the mobile applications.

Basic Sequence:

1. User and the device must be verified if s/he doesn't have an account.
2. User shall login to the system by entering his/her username and password.
3. Admin can add a teacher to the database by selecting add a teacher button from admin menu.
4. Admin can verify a device which is registered recently by selecting verify a device button from admin menu.
5. Teacher can edit his/her timetable by adding or removing lectures.
6. Teacher can publish an announcement by selecting the publish announcement button from teacher menu.
7. User can logout from the system by selecting logout button.

Exception: Database connection can be failed.

Post Conditions: Changes made by the admin will be saved to the related tables. Published announcements will appear on the related screens on the touchscreen.

Priority: High

5.2.2.2 Touchscreen Display

Summary: Student can see the teacher's timetable, check the announcements and send an email to the teacher.

Actor: Student

Precondition: Student must enter his/her e-mail address to send message. Other actions do not require any preconditions.

Basic Sequence:

1. Student can check the teacher's timetable which is placed on the main page of the touchscreen.
2. Student can check the published announcements by clicking the left arrow button.
3. Student can send an e-mail to the teacher by selecting a template, entering their email addresses and allowing the device to take their pictures from the screen.

Exception: None

Post Conditions: The touchscreen automatically returns to the main page if the screen remains untouched for 60 seconds.

Priority: Medium

5.2.3 Activity Diagram

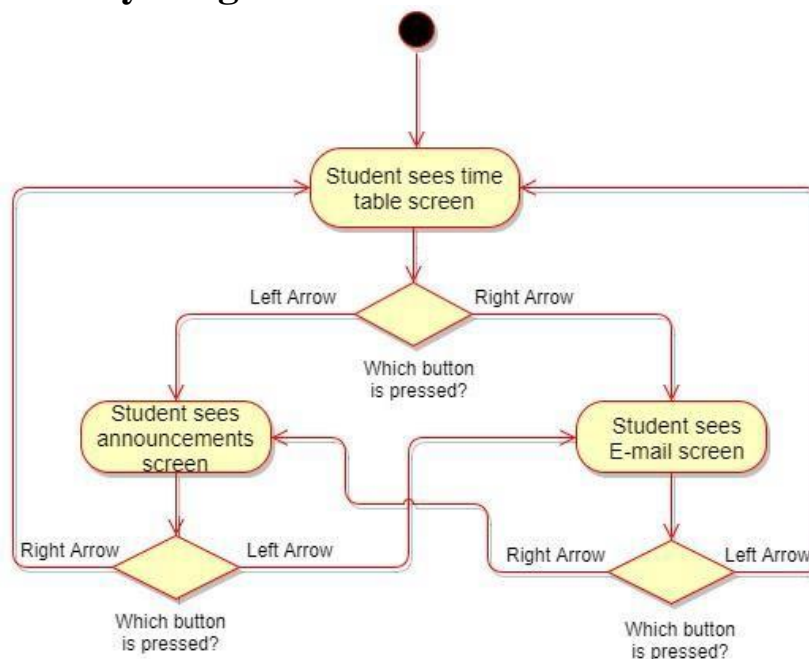


Figure 7: Activity Diagram of Touchscreen Usage

Figure 7 shows how the interaction between the touchscreen and students occurs as an activity diagram. The student shall click on right or left arrow button on the screen or none of

them. If he/she chooses not to click anything, the timetable stays on the screen. If the student presses the right arrow button, e-mail page appears on the screen. If he/she presses the right arrow button while on the e-mail page, the touchscreen returns to the main page. If the left arrow is pressed, the page goes to the announcements screen.

5.2.4 Work Load Table

Gantt Chart in Figure 8 represents whole development plan of the project.



Figure 8: Gantt Chart of Work Plan

5.3 Use Case Realizations

Adroit System for Online Time Table and Announcement Project

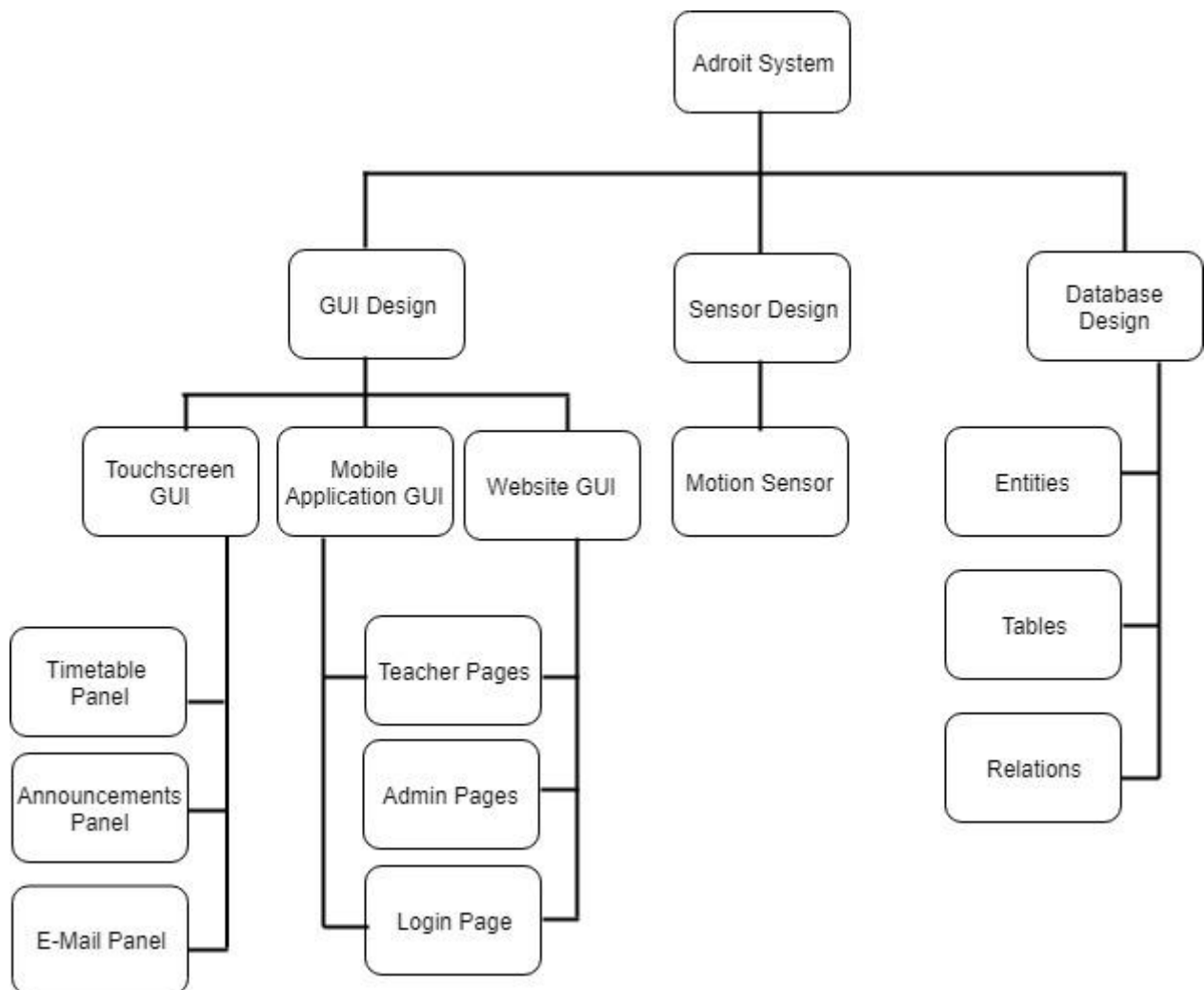


Figure 9: Project Components

5.3.1 Brief Description of Figure 9

Components of the Adroit System for Online Timetable and Announcements Project are shown in the *Figure 9*. All designed systems of the project are displayed in the block diagram in this figure. There are three main components of the system which have their own sub- systems.

5.3.1.1 GUI Design

GUI design is responsible for interaction between the students, teachers, admins and the system. There are three sub-systems in this design which are Touchscreen GUI, Mobile

Application GUI and Website GUI. These three sub-systems are divided into other sub-systems. Touchscreen GUI consists of Timetable Panel, Announcements Panel and E-Mail Panel. Website GUI include Teacher Pages, Admin Pages and Login Page. The Mobile Application GUI is only for the teachers. That GUI include Teacher Pages and Login Page. To be able to navigate between various pages, there are arrow buttons which user can press to go from one page to another. On the top of the screen, the teacher's title, name and surname are shown.

5.3.1.2 Sensor Design

Sensor Design is responsible for the management of the power of the components and reducing the carbon footprint of the components. When a student comes in front of the screen, the sensor will sense the motion and activate the touchscreen. With the help of this motion sensor, energy saving will be provided.

5.3.1.3 Database Design

Database design is responsible for the data that will be read, written and kept track of. The information about teachers, admins, students and components will be stored in the database. This design includes entities, tables and relations.

5.4 Human Interface Design

5.4.1 Overview of User Interface

For an effective interaction between the users and the system, a user interface is crucial. Our project consists of three different user interface designs. Touchscreen, Website and Mobile Application. These three divides into sub-parts in themselves. Timetable Panel is placed on the main page which show the students the teacher's timetable and schedule (Figure 10).

| Asst. Prof. Dr. Abdül Kadir GÖRÜR | | | | | |
|-----------------------------------|----------------|----------------|----------------|----------------|----------------|
| | Monday | Tuesday | Wednesday | Thursday | Friday |
| 09.20 | | | CENG218 (LB05) | | |
| 10.20 | | Office Hour | CENG218 (LB05) | | |
| 11.20 | CENG218 (LB06) | | | CENG218 (H315) | |
| 12.20 | CENG218 (LB06) | | | CENG218 (H315) | CENG218 (LB06) |
| 13.20 | | CENG218 (H335) | | | CENG218 (LB05) |
| 14.20 | | CENG218 (H335) | | | |
| 15.20 | | | | | CENG218 (H302) |
| 16.20 | | | | | CENG218 (H302) |

Figure 10: Main Page with Timetable Panel

When the right arrow button is pressed, e-mail page is opened and e-mail panel appears on the screen (Figure 11). Student can select a message template and send it to the teacher after entering his/her e-mail address.

| Asst. Prof. Dr. Abdül Kadir GÖRÜR | | | |
|---------------------------------------------|--|-----|-------------------------|
| Enter E-Mail: c | | | @student.cankaya.edu.tr |
| Can I get an appointment? | | 7 | 8 |
| When can I look at my exam paper? | | 4 | 5 |
| I came but I could not find you. | | 1 | 2 |
| May I get information about the Lab lesson? | | Del | 0 |
| | | | Reset |

Figure 11: E-Mail Screen and Panel

If the right arrow is pressed again in this page, announcement page is opened and announcements appear on the screen (Figure 12). Student can check published announcements. Moreover, if the left arrow button is pressed while the system is on the main page, announcements page is opened. If again the left arrow is pressed on the announcements page, e-mail page is opened.

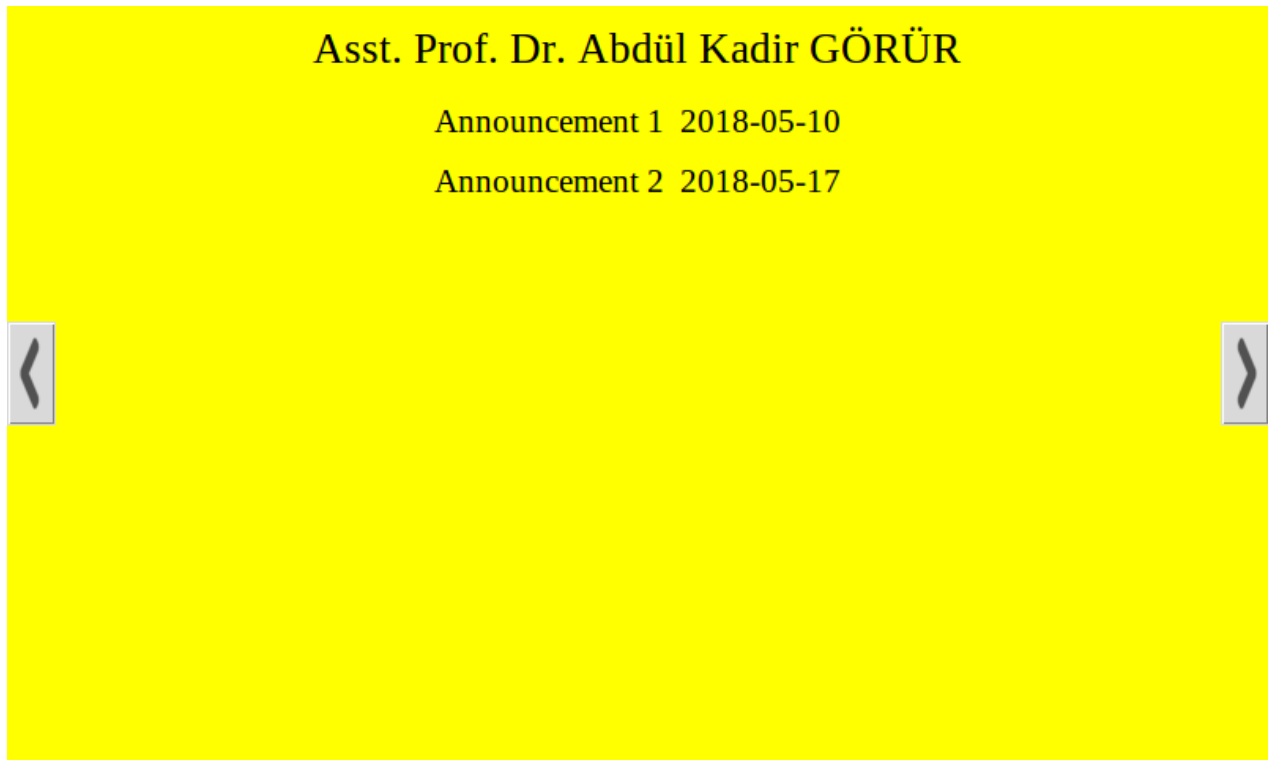


Figure 12: Announcements Screen and Panel

In the website, Teacher Pages include specific designs for teachers to login, check, publish and edit announcements, check the received e-mails and reply them, edit his/her timetable and logout. Admin Pages include specific designs for admins to login, add a teacher to the database and verify a newly registered device.

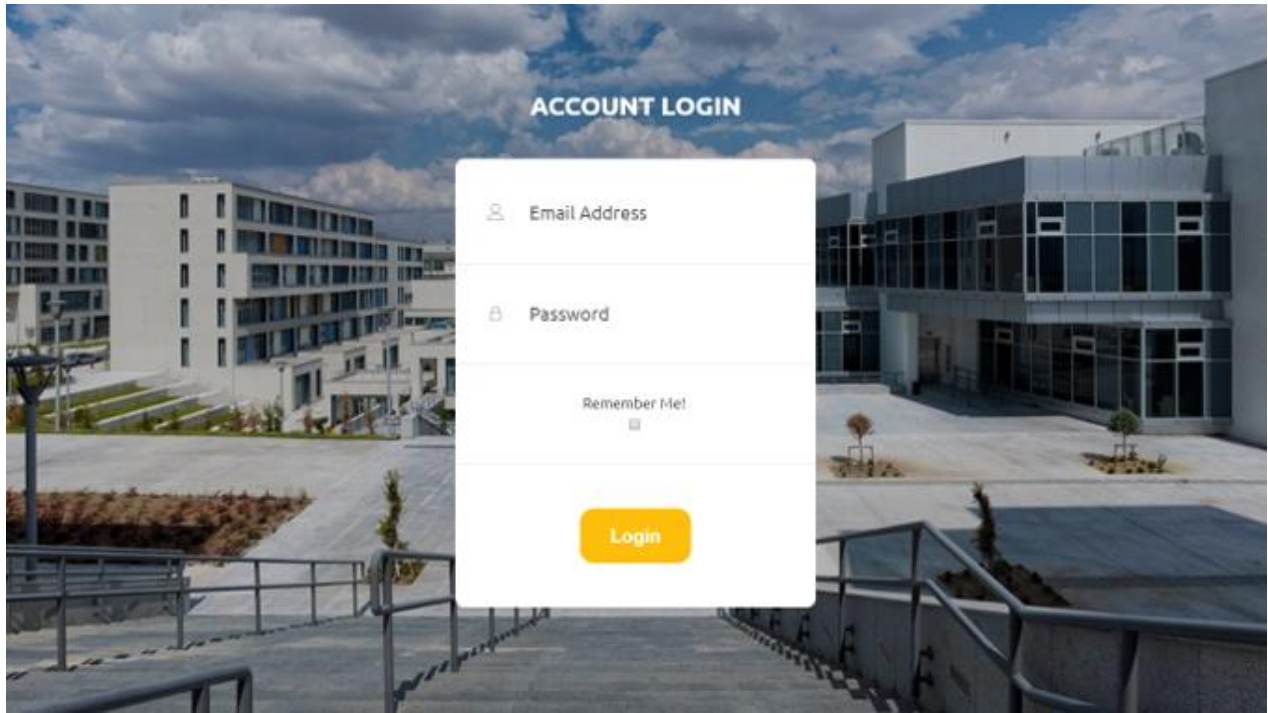


Figure 13: Login Page in Website

All users have to login to the system by entering email and password for performing various actions by clicking login button (Figure 13). If user clicks on the remember me box, the user name will be automatically written on the next login.

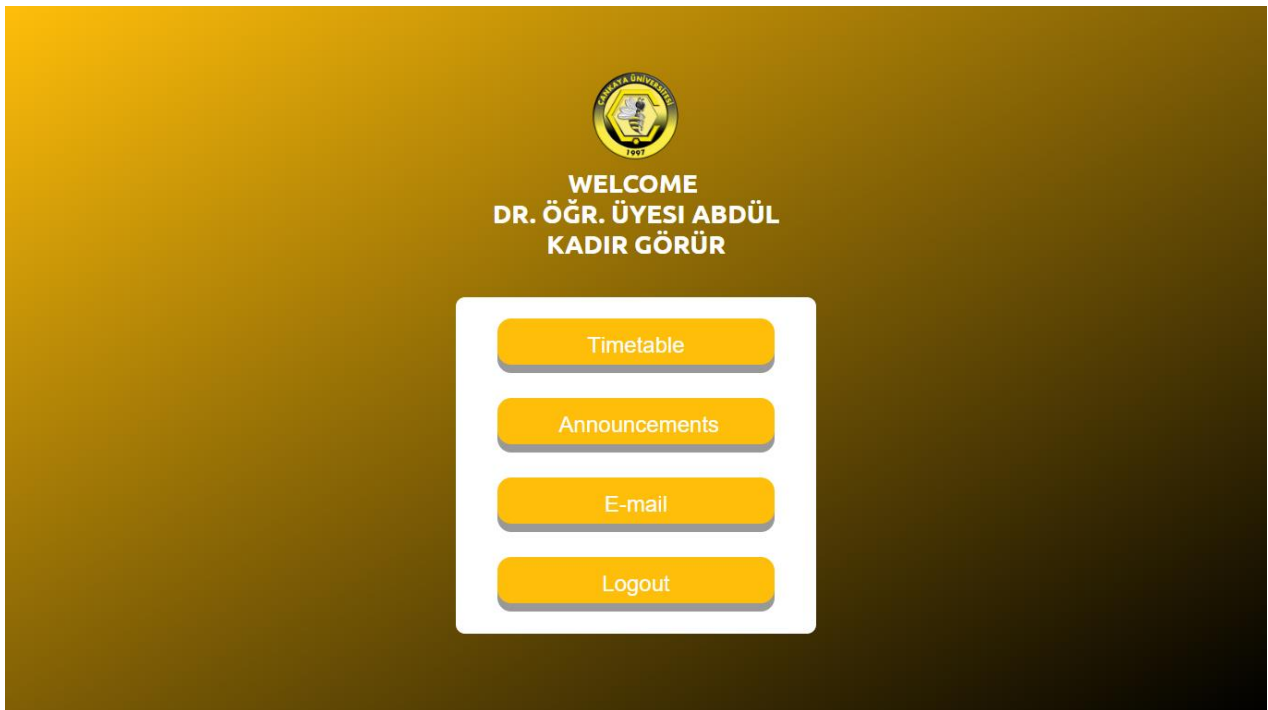


Figure 14: Teacher Home Page

There are four buttons on the teacher home page (Figure 14). You can go to timetable page by clicking timetable button. You can go to announcement page by clicking announcement button. You can go to emails page by clicking the email button. You can logout from the system by clicking logout button.

| | Monday | Tuesday | Wednesday | Thursday | Friday |
|-------|---------------|---------------|---------------|---------------|---------------|
| 09:20 | | | CENG 218 LB05 | | |
| 10:20 | | Office Hour | CENG 218 LB05 | | |
| 11:20 | CENG 218 LB06 | | | CENG 218 H315 | |
| 12:20 | CENG 218 LB06 | | | CENG 218 H315 | CENG 218 LB06 |
| 13:20 | | CENG 218 H335 | | | CENG 218 LB05 |
| 14:20 | | CENG 218 H335 | | | |
| 15:20 | | | | | CENG 218 H302 |
| 16:20 | | | | | CENG 218 H302 |

Figure 15: Timetable Page

This page is the Timetable Page (Figure 15). You can add extra hours into your timetable by selecting day, hour and content. Also, you can delete all the added extra hours in Timetable page.

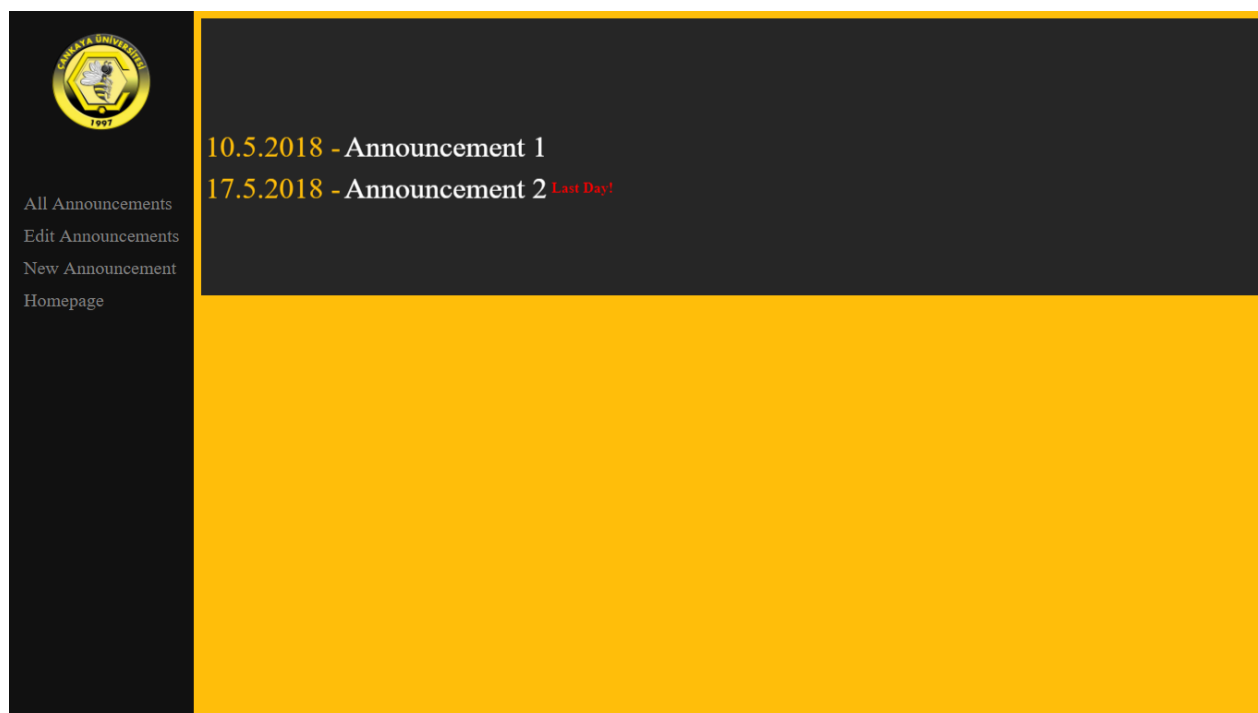


Figure 16: Announcements Page

This page is the Announcement Page (Figure 16). You can see all the published announcements with their published date by clicking the all announcements button. If the ‘Last Day’ warning it appears for any announcement, it is the last day for this announcement before it expires.

| Content | Publish Date | Exp Date | Operations |
|----------------|---------------------|---------------------|----------------------------------------------------------|
| Announcement 1 | 10.05.2018 22:29:59 | 28.05.2018 10:10:00 | Update Announcement Exit |
| Announcement 2 | 17.05.2018 22:30:22 | 18.05.2018 11:15:00 | Select Remove |

Figure 17: Edit Announcements Page

This page is the Edit Announcements Page (Figure 17). You can select any announcement to perform actions by clicking the select button appearing on the gridview. After clicking the select button, you can update your announcement content via textboxes and by clicking the update announcements button. After clicking the select button, you can choose not to perform any action by clicking the exit button appearing on the gridview. You can remove an announcement by clicking the remove button appearing on the gridview.

The image shows a web application interface for creating a new announcement. On the left is a dark sidebar with a circular logo at the top containing a book and the text 'KAMUKA UNIVERSITY' and '1997'. Below the logo are four menu items: 'All Announcements', 'Edit Announcements', 'New Announcement', and 'Homepage'. The main area has a yellow background. At the top left of this area, the word 'Content:' is followed by a large white text input box. Below this, 'Expire Date:' is followed by a date picker showing 'gg - aa - yyyy -- : - -'. At the bottom left of the yellow area is a black button with the word 'Publish' in white text.

Figure 18: New Announcement Page

This page is the New Announcement Page (Figure 18). You can publish a new announcement after filling the content textbox, selecting an expiry date and clicking the publish button.

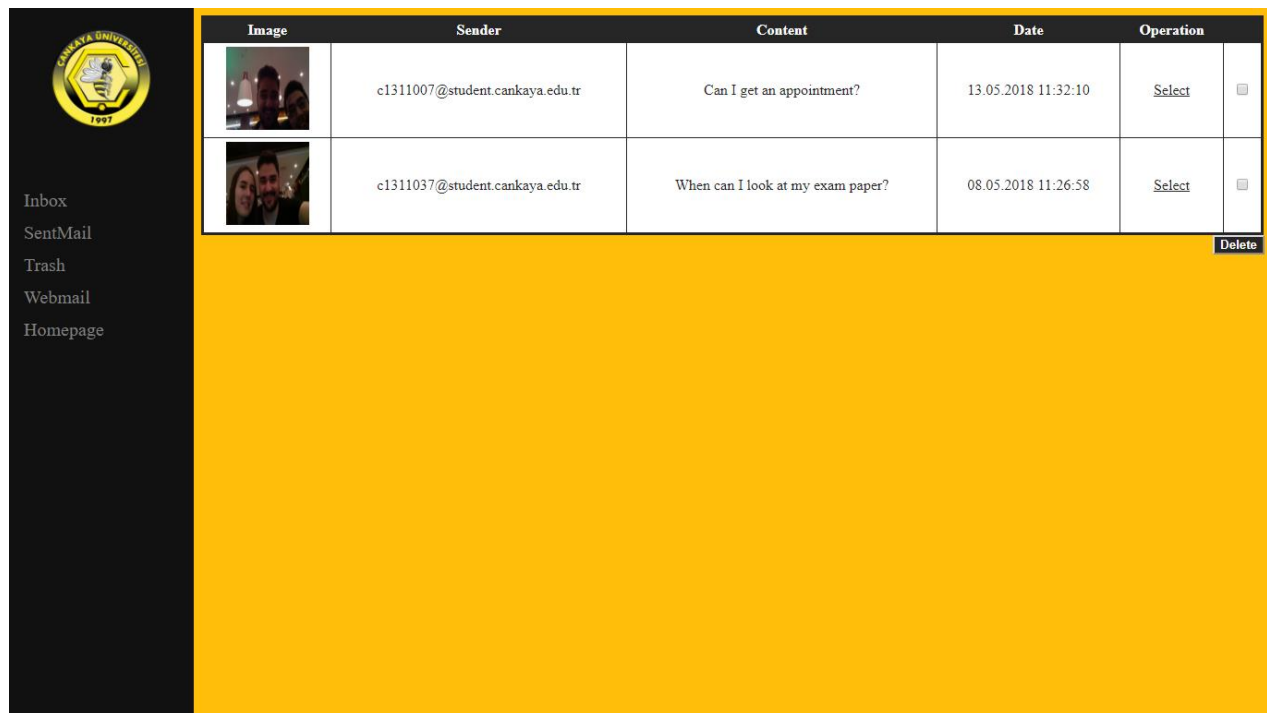


Figure 18: Inbox Page

This is the Inbox Page (Figure 19). You can select any emails to perform actions by clicking the select button appearing on the gridview. You can go to Çankaya University Webmail service by clicking the webmail button.

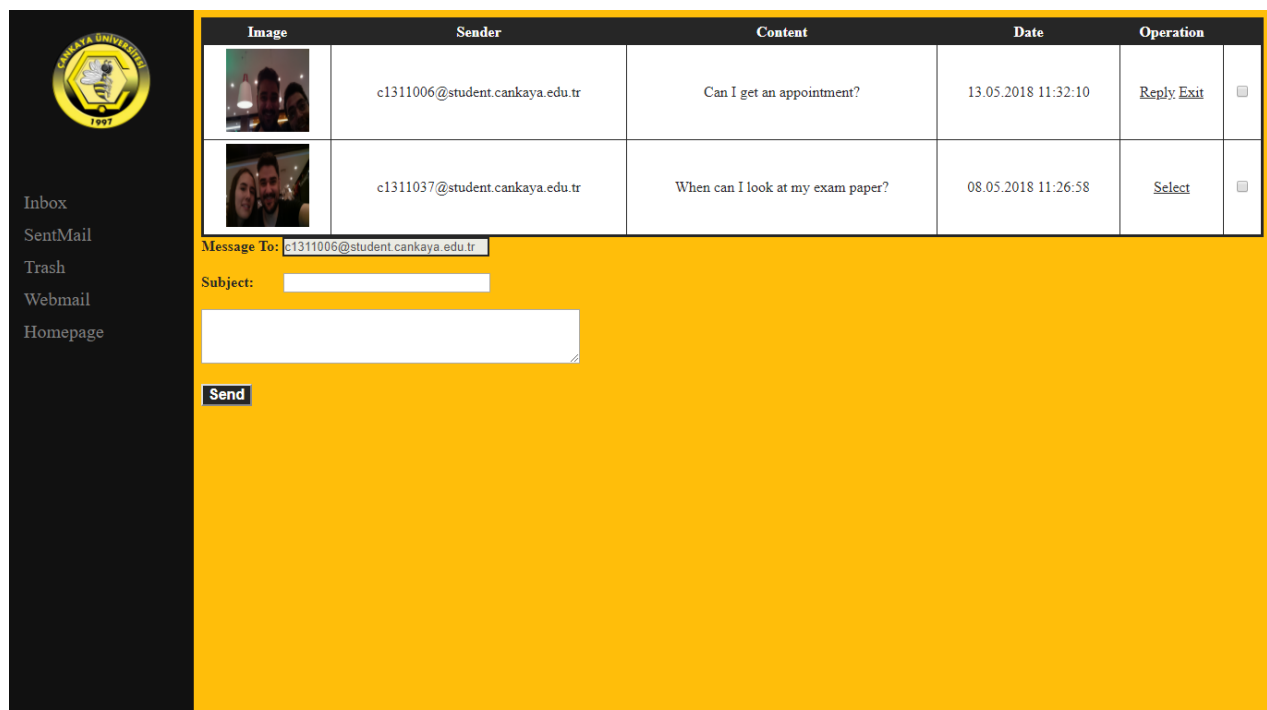


Figure 20: Reply Page

After clicking on the select button, you can reply an email by clicking the reply button appearing on the gridview. After clicking the reply button, you can send replies to the students by writing an email content and clicking the send button. After clicking the select button, you can choose not to perform any action by clicking the exit button appearing on the gridview. After selecting emails by clicking on the checkboxes, you can delete the selected emails by clicking the delete button. (Figure 20)

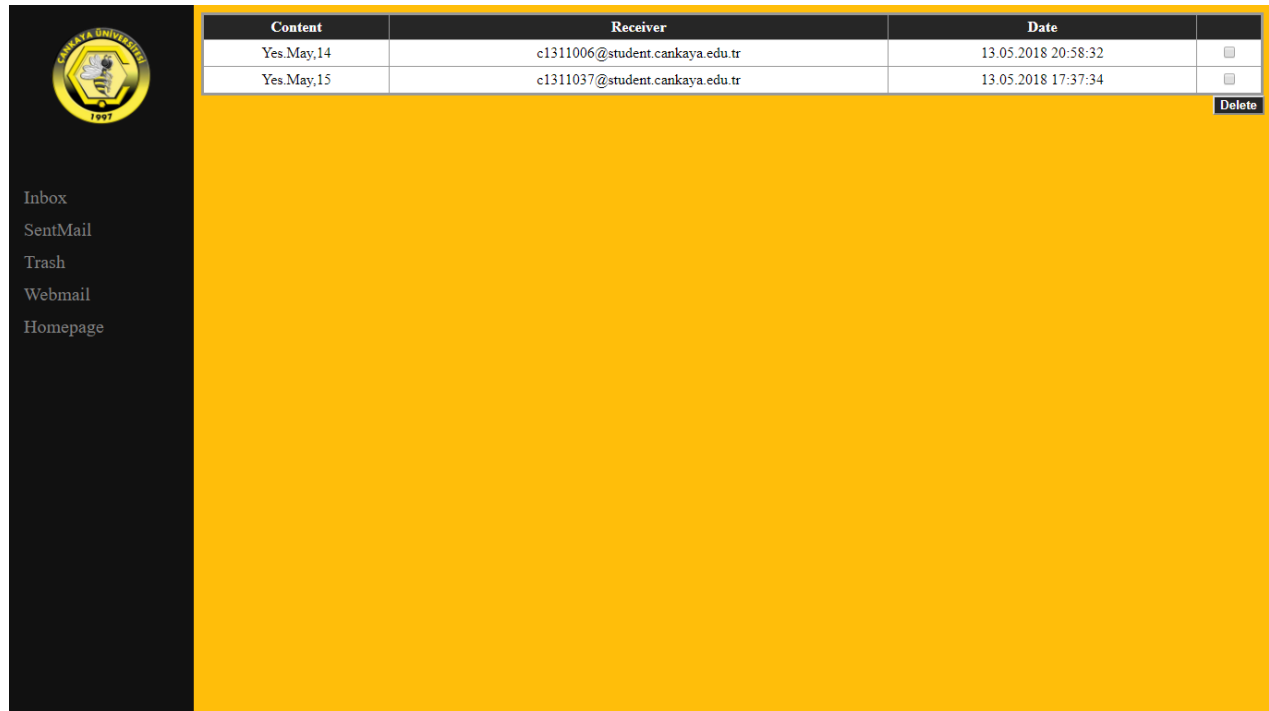


Figure 21: Sent Email Page

This is the Sent Mail Page (Figure 21). After selecting emails by clicking on the checkboxes, you can delete the selected emails by clicking the delete button.

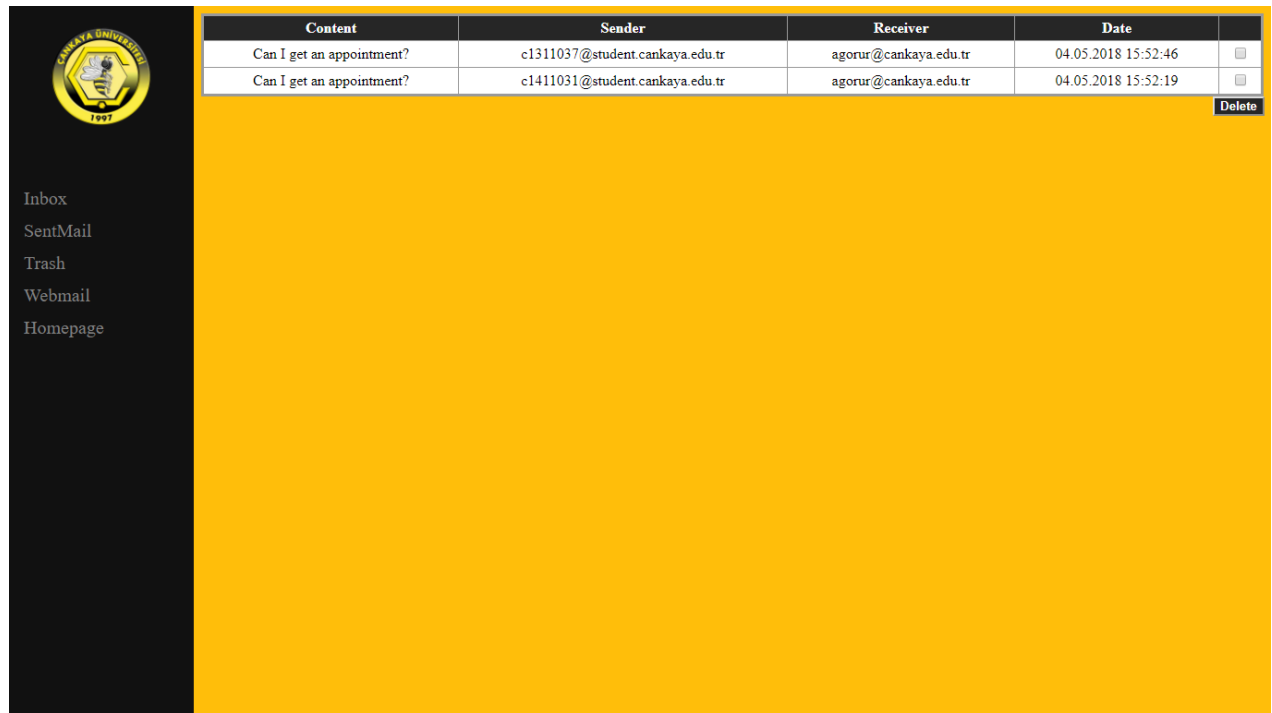


Figure 22: Trash Page

This is the Trash Page (Figure 22). After selecting emails by clicking on the checkboxes, you can delete the selected emails permanently by clicking the delete button.

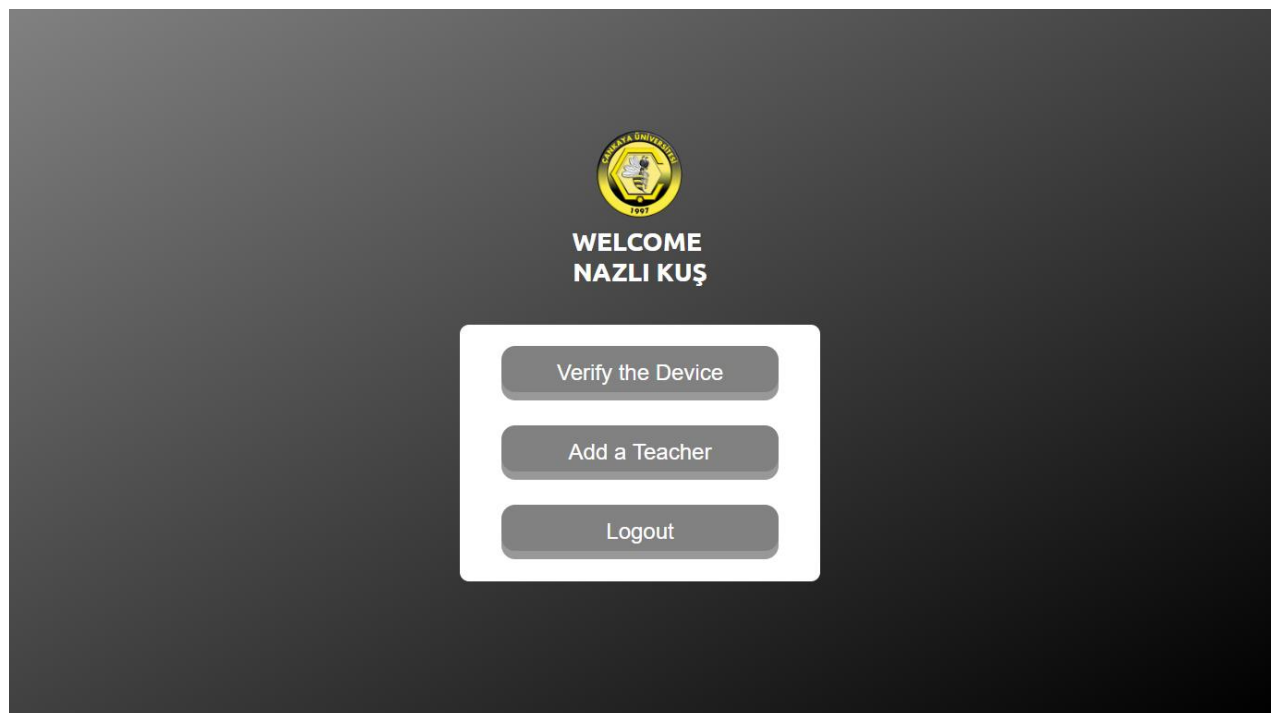


Figure 23: Admin Home Page

This is the admin homepage (Figure 23). There are three buttons; Verify the Device button, Add a Teacher button and Logout button. You can go to Verify the Device page by clicking Verify the Device button. You can go to Add a Teacher page by clicking Add a Teacher button.

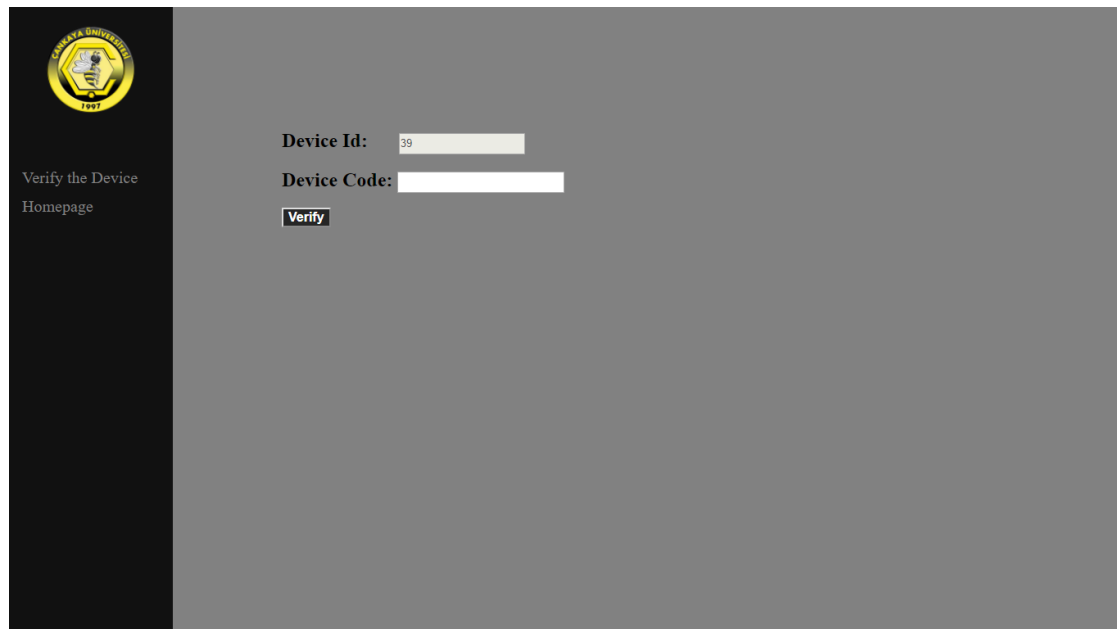


Figure 24: Verify the Device Page

This is the Verify the Device Page (Figure 24). Device Id automatically comes up. You cannot change the Device Id. You can write new code for the device.

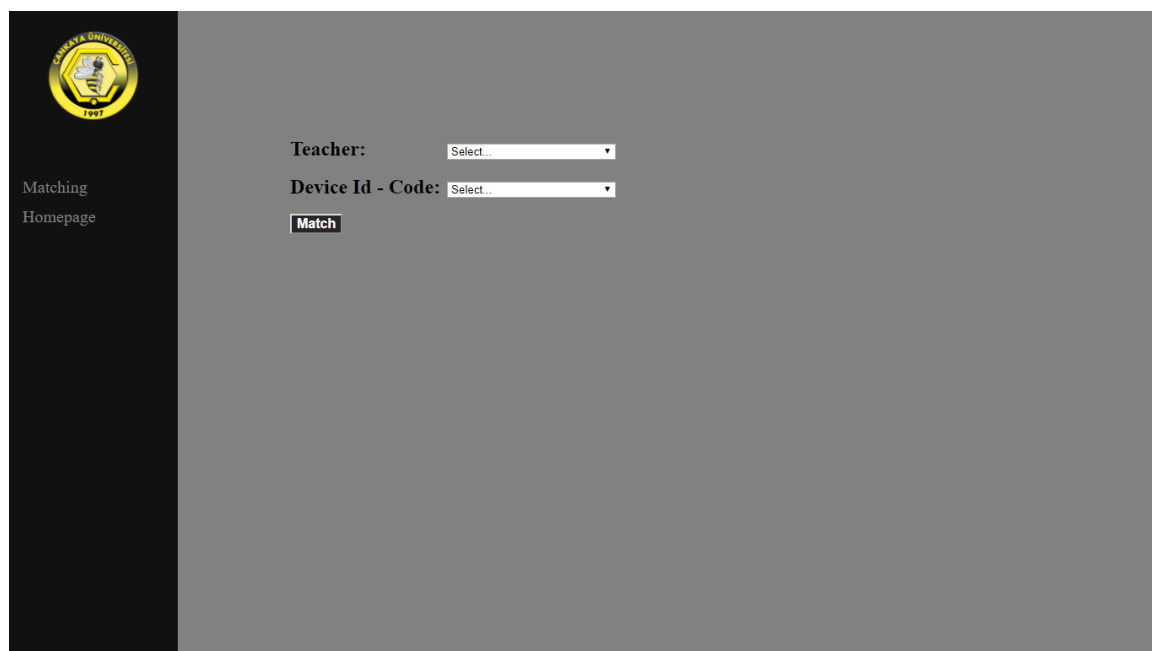


Figure 25: Add a Teacher Page

This is the Add a Teacher Page (Figure 25). You can select a teacher and a device that are available. After these selections, by clicking the match button, you can match them.

In the Mobile Application, Teacher Pages include specific designs for teachers to login, check, publish and edit announcements, check the received e-mails and reply them, edit his/her timetable and logout.

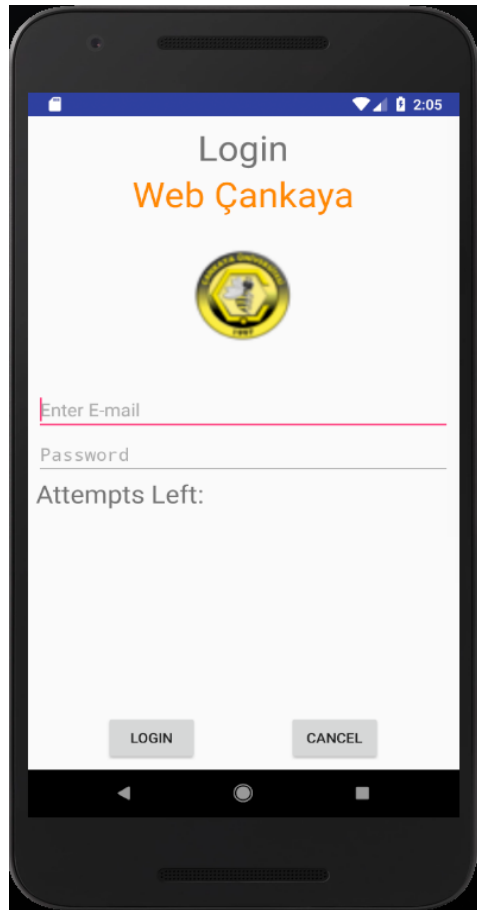


Figure 26: Login Page on Mobile Application

You have to login to the system by entering email and password for performing various actions by clicking login button (Figure 26).

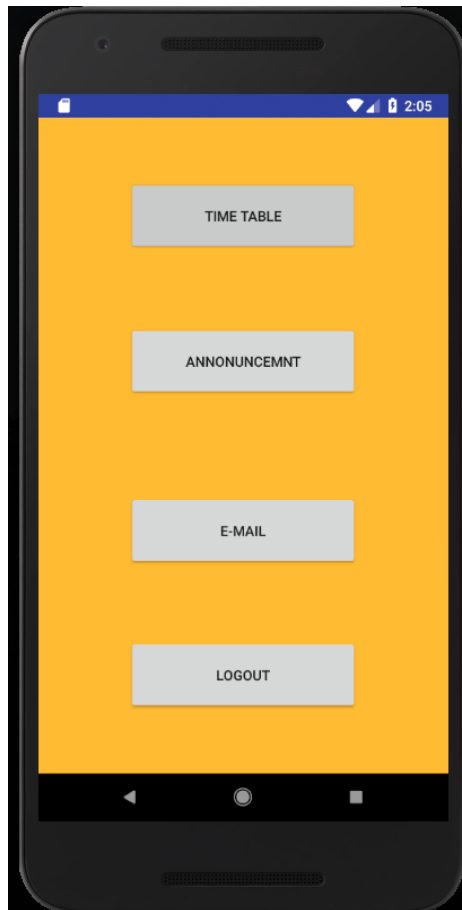


Figure 27: Teacher Home Page

There are four buttons; timetable button, announcements button, email button and logout button. You can go to timetable page by clicking timetable button. You can go to announcement page by clicking announcement button. You can go to emails page by clicking the email button. You can logout from the system by clicking logout button (Figure 27).



Figure 28: Timetable Page

This page is the Timetable Page (Figure 28). You can add extra hours into your timetable by selecting day, hour and content. Also, you can delete all the edit extra hours in Timetable page. You can see your timetable for Tuesday by clicking the Tuesday button. You can see your timetable for Wednesday by clicking the Wednesday button. You can see your timetable for Thursday by clicking the Thursday button. You can see your timetable for Friday by clicking the Friday button.

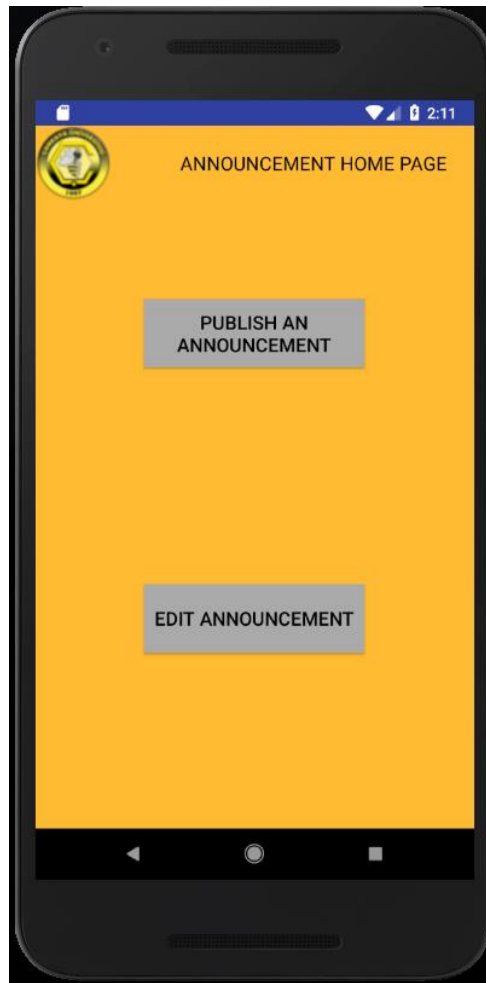


Figure 29: Announcement Home Page

This is the Announcement Homepage (Figure 29). There are two buttons; Publish an Announcement button and Edit Announcement button.

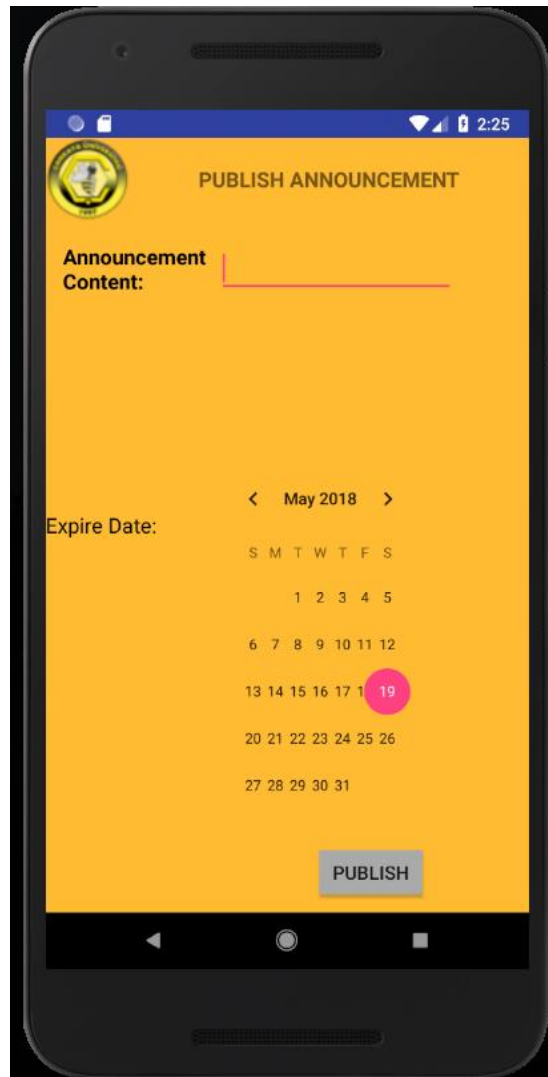


Figure 30: Publish Announcement Page

This is the Publish Announcement Page (Figure 30). You can publish a new announcement after entering a content, selecting an expiry date and clicking the publish button.

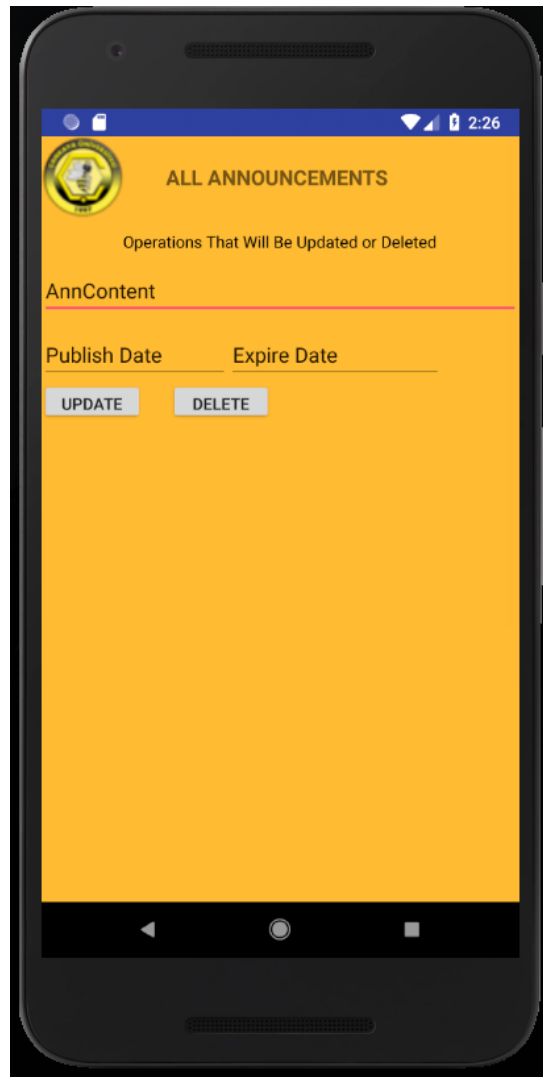


Figure 31: Edit Announcement Page

This is the Edit Announcement Page (Figure 31). You can update a selected announcement by entering a new content and clicking on the update button. You can delete a selected announcement by clicking on the delete button.

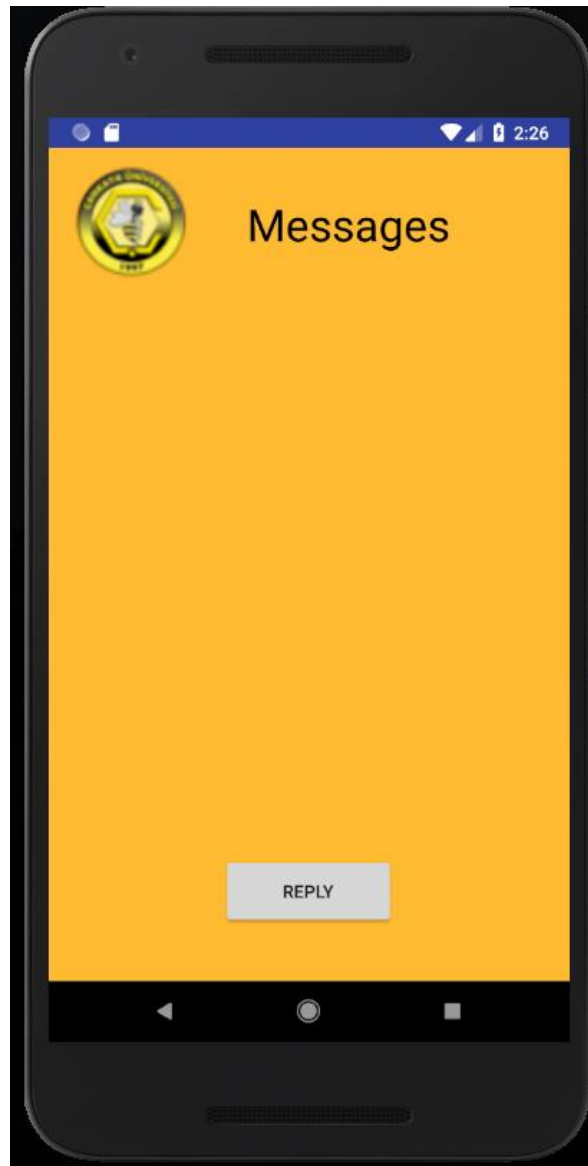


Figure 32: Email Page

This page is the Email Page (Figure 32). You can see all emails in this page. Also, you can send a message with reply button.

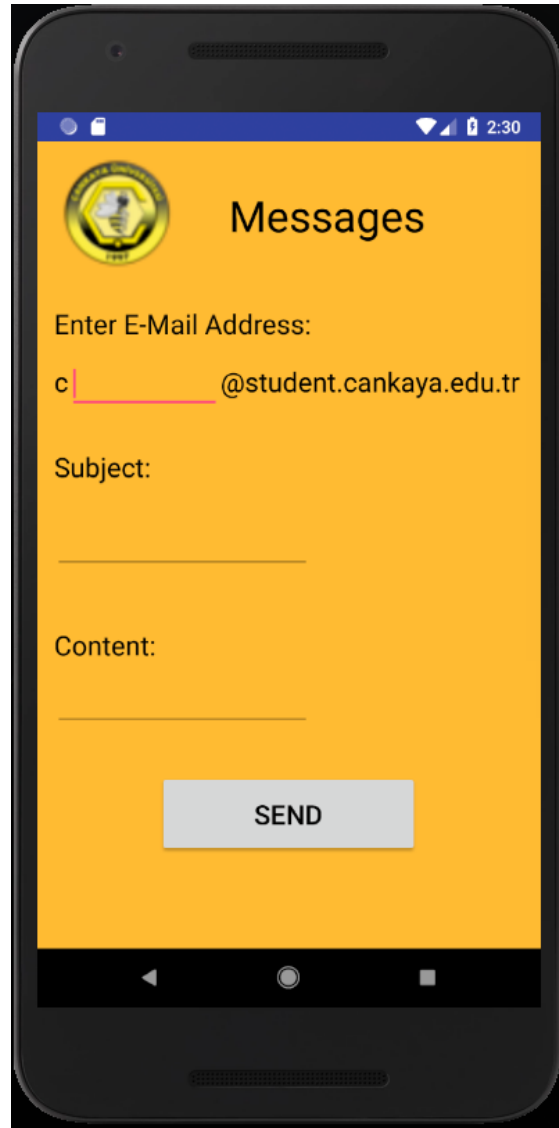


Figure 33: Email-Reply Page

This page is the Email Reply Page (Figure 33). You can reply an email by typing in the sender's email address, message subject and the message content with send button.

6. Test Plan

6.1 Introduction

6.1.1 Version Control

| Version No | Description of Changes | Date |
|------------|------------------------|--------------|
| 1.0 | First Version | Mar 13, 2018 |
| 2.0 | Second Version | May 18, 2018 |
| | | |

6.1.2 Overview

The functions of Adroit System for Online Time Table and Announcement Project's users which are admins, teachers and students will be tested. These functions have already been determined in the software requirements specification document.

6.1.3 Scope

This document encapsulates the test plan of the use cases and functions, test design specifications and the test cases correspond to test plan.

6.1.4 Terminology

| Acronym | Definition |
|---------|--------------------------|
| GUI | Graphical User Interface |
| MA | Mobile Application |
| WS | Website |

6.2 Features to be Tested

This section lists and gives a brief description of all the major features to be tested. For each major feature there will be a Test Design Specification added at the end of this document.

6.2.1 Graphical User Interface (GUI)

In this project, graphical user interface (GUI) is divided into three parts which are touchscreen, mobile application and website. Every GUI component has smaller parts in it that will be tested such as buttons, textboxes, labels etc.

6.2.2 Mobile Application (MA)

Mobile application will be developed for teachers. Mobile application includes login panel, email panel, announcement panel and timetable panel. It will be expected from teachers that

they will successfully login to their account, change their timetable, publish an announcement, check their emails and logout.

6.2.3 Website (WS)

Website will be developed for teachers and admins. Website includes login panel, email panel, announcement panel and timetable panel for teachers. Also, admins can use login panel, verify panel and add a teacher panel. It will be expected from teachers that they will successfully login to their account, change their timetable, publish an announcement, check their emails, logout and will be expected from admins that they will successfully login to their account, add a teacher to the database, verify the device and logout.

6.3 Item Pass/ Fail Criteria

6.3.1 Exit Criteria

- 100% of the test cases are executed
- 90% of the test cases passed
- 90% of high and medium priority test cases are passed

6.4 References

[1]. GitHub. (2018). Software Design Document. [online] Available at: <https://github.com/CankayaUniversity/ceng-407-408-project-adroit-system-for-online-time-table-and-announcement/wiki/Software-Design-Document> [Accessed 6 Mar. 2018].

[2]. GitHub. (2018). Software Requirements Specification Document. [online] Available at: <https://github.com/CankayaUniversity/ceng-407-408-project-adroit-system-for-online-time-table-and-announcement/wiki/Software-Requirements-Specification> [Accessed 6 Mar. 2018].

6.5 Test Design Specification

6.5.1 Graphical User Interface (GUI)

6.1.1.1 Sub features to be tested

- Right Arrow Button on Touchscreen (GUI.R_BTN)

Students can navigate between the pages by using right arrow button.

- Left Arrow Button on Touchscreen (GUI.L_BTN)

Students can navigate between the pages by using left arrow button.

- Timetable Panel on Touchscreen (GUI.TP_TS)

Timetable of the teacher will be displayed to the students on the main page of the touchscreen.

- Email Panel on Touchscreen (GUI.EP_TS)

Students can send an email to the teacher by selecting a template message and typing in their email address.

- Template Button on Email Panel (GUI.EP_TB_TS)

Students can select one of four template messages by clicking on the selected one.

- Numpad on Email Panel (GUI.EP_NP_TS)

Students can enter their student numbers by clicking the numbers on the numpad.

- Del Button on Numpad on Email Panel (GUI.EP_NP_DB_TS)

Students can delete a number they entered by clicking the del button.

- Res Button on Numpad on Email Panel (GUI.EP_NP_RB_TS)

Students can delete all the entered numbers by clicking the res button.

- Announcement Panel on Touchscreen (GUI.AP_TS)

Announcements published by the teacher will be displayed to the students on announcement panel.

- Login Button on Website (GUI.LGN_BTN_WS)

Admins and teachers have to login to the system by entering email and password for performing various actions by clicking login button.

- Email Button on Website (GUI.EM_BTN_WS)

Teachers can go to emails page by clicking the email button.

- Inbox Button on Email Page (GUI.EM_INB_BTN_WS)

Teachers can see the received emails by clicking the inbox button on the email page.

- Select Button on Inbox Page (GUI.IP_SLC_BTN_WS)

Teachers can select any emails to perform actions by clicking the select button appearing on the gridview.

- Reply Button on Inbox Page (GUI.IP_REP_BTN_WS)

After clicking on the select button, teachers can reply an email by clicking the reply button appearing on the gridview.

- Send Button on Inbox Page (GUI.IP_SND_BTN_WS)

After clicking the reply button, the teachers can send replies to the students by writing an email content and clicking the send button.

- Exit Button on Inbox Page (GUI.IP_EXT_BTN_WS)

After clicking the select button, the teacher can choose not to perform any action by clicking the exit button appearing on the gridview.

- Delete Button on Inbox Page (GUI.IP_DEL_BTN_WS)

After selecting emails by clicking on the checkboxes, the teachers can delete the selected emails by clicking the delete button.

- Sent Mail Button on Email Page (GUI.EM_SM_BTN_WS)

Teachers can see the emails sent to the students by clicking the sent mail button.

- Delete Button on Sent Mail Page (GUI.SM_DEL_BTN_WS)

After selecting emails by clicking on the checkboxes, the teachers can delete the selected emails by clicking the delete button.

- Trash Button on Email Page (GUI.EM_TRS_BTN_WS)

Teachers can see the deleted emails by clicking the trash button.

- Delete Button on Trash Page (GUI.TRS_DEL_BTN_WS)

After selecting emails by clicking on the checkboxes, the teachers can delete the selected emails permanently by clicking the delete button.

- Webmail Button on Email Page (GUI.EM_WBM_BTN_WS)

Teachers can go to Çankaya University Webmail service by clicking the webmail button.

- Announcements Button on Website (GUI.A_BTN_WS)

Teachers can go to announcement page by clicking announcements button.

- All Announcements Button on Announcements Page
(GUI.A_AA_BTN_WS)

Teachers can see all the published announcements by clicking the all announcements button.

- Edit Announcements Button on Announcements Page
(GUI.A_EA_BTN_WS)

Teachers can go to edit announcements page by clicking the edit announcement button.

- Select Button on Edit Announcements Page (GUI.EA_SLC_BTN_WS)

Teachers can select any announcement to perform actions by clicking the select button appearing on the grid view.

- Update Announcement Button on Edit Announcements Page
(GUI.EA_UA_BTN_WS)

After clicking the select button, teachers can update their announcement content via textboxes and by clicking the update announcements button.

- Exit Button on Edit Announcements Page (GUI.EA_EXT_BTN_WS)

After clicking the select button, the teacher can choose not to perform any action by clicking the exit button appearing on the gridview.

- Remove Button on Edit Announcements Page (GUI.EA_RM_BTN_WS)

Teachers can remove an announcement by clicking the remove button appearing on the gridview.

- New Announcement Button on Announcements Page
(GUI.A_NA_BTN_WS)

Teachers can go to publish announcements page by clicking the new announcement button.

- Publish Button on New Announcement Page (GUI.NA_PBL_BTN_WS)

Teachers can publish a new announcement after filling the content textbox, selecting an expire date and clicking the publish button.

- Timetable Button on Website (GUI.T_BTN_WS)

Teachers can go to timetable page by clicking timetable button.

- Add Button on Timetable Page (GUI.TP_ADD_BTN_WS)

Teachers can add extra hours to their timetables by selecting the day, hour and the extra item from the drop-down lists and clicking on the add button.

- Reset Button on Timetable Page (GUI.TP_RES_BTN_WS)

Teachers can delete all the added extra hours by clicking the reset button.

- Logout Button on Website (GUI.LG_BTN_WS)

Admins and Teachers can logout from the system by clicking logout button.

- Verify the Device Button on Website (GUI.VD_BTN_WS)

Admins can go to verify the device page by clicking verify the device button.

- Verify Button on Verify the Device Page (GUI.VD_V_BTN_WS)

Admins can verify a device by typing in a code for the device by clicking the verify button.

- Add a Teacher Button on Website (GUI.AT_BTN_WS)

Admins can go to add a teacher page by clicking add a teacher button.

- Match Button on Add a Teacher Page (GUI.AT_M_BTN_WS)

Admins can match available teachers and devices by selecting a teacher and a device from dropdown lists and clicking the match button.

- Homepage Button on Website (GUI.HP_BTN_WS)

Teachers and admins can go to their respective homepages by clicking the homepage button.

- Login Button on Mobile Application (GUI.LGN_BTN_MA)

Teachers have to login to the system by entering email and password for performing various actions by clicking login button.

- Check Email Button on Mobile Application (GUI.EM_BTN_MA)

Teachers can go to check email page by clicking the check email button.

- Reply Button on Email Page (GUI.EP_REP_BTN_MA)

Teachers can reply an email by typing in the sender's email address and the message content.

- Announcements Button on Mobile Application (GUI.A_BTN_MA)

Teachers can go to announcements page by clicking announcements button.

- Publish an Announcement Button on Announcement Page
(GUI.A_PA_BTN_MA)

Teachers can go to publish an announcement page by clicking publish an announcement button.

- Publish Button on Publish an Announcement Page (GUI.PA_P_BTN_MA)

Teachers can publish a new announcement after entering a content, selecting an expiry date and clicking the publish button.

- Edit Announcement Button on Announcement Page
(GUI.A_EDT_BTN_MA)

Teachers can go to edit announcement page by clicking edit announcement button.

- Update Button on Edit Announcement Page (GUI.EA_U_BTN_MA)

Teachers can update a selected announcement by entering a new content and clicking on the update button.

- Delete Button on Edit Announcement Page (GUI.EA_DEL_BTN_MA)

Teachers can delete a selected announcement by clicking on the delete button.

- Timetable Button on Mobile Application (GUI.T_BTN_MA)

Teachers can go to timetable page by clicking timetable button.

- Tuesday Button on Timetable Page (GUI.TP_T_BTN_MA)

Teachers can see their timetable for Tuesday by clicking the Tuesday button.

- Wednesday Button on Timetable Page (GUI.TP_W_BTN_MA)

Teachers can see their timetable for Wednesday by clicking the Wednesday button.

- Thursday Button on Timetable Page (GUI.TP_TH_BTN_MA)

Teachers can see their timetable for Thursday by clicking the Thursday button.

- Friday Button on Timetable Page (GUI.TP_F_BTN_MA)

Teachers can see their timetable for Friday by clicking the Friday button.

- Add Button on Timetable Page (GUI.TP_ADD_BTN_MA)

Teachers can add extra hours to their timetables by selecting the day, hour and the extra item from the drop-down lists and clicking on the add button.

- Logout Button on Mobile Application (GUI.LG_BTN_MA)

Teachers can logout from the system by clicking logout button.

6.1.1.2 Test Cases

| TC ID | Requirements | Priority | Scenario Description |
|--------------|--------------|----------|------------------------------------------------------------------------------------------------|
| GUI.R_BTN.01 | 4.1.3 | L | Click “Right Arrow” button. After clicking, the current page will be changed with another one. |

| TC ID | Requirements | Priority | Scenario Description |
|--------------|--------------|----------|-----------------------------------------------------------------------------------------------|
| GUI.L_BTN.01 | 4.1.3 | L | Click “Left Arrow” button. After clicking, the current page will be changed with another one. |

| TC ID | Requirements | Priority | Scenario Description |
|--------------|--------------|----------|-------------------------------------------------------------------------|
| GUI.TP_TS.01 | 4.1.3 | H | The timetable of the teacher is displayed correctly on the touchscreen. |

| TC ID | Requirements | Priority | Scenario Description |
|--------------|--------------|----------|--------------------------------------------------------------------------------------------------------------------------|
| GUI.EP_TS.01 | 4.1.3 | H | After clicking left or right arrow button, message templates, sender email address box and the numpad will be displayed. |
| GUI.EP_TS.02 | 4.1.3 | M | Enter a valid email address. |
| GUI.EP_TS.03 | 4.1.3 | M | Enter an invalid email address. |

| TC ID | Requirements | Priority | Scenario Description |
|-----------------|--------------|----------|--------------------------------------------------------------------------|
| GUI.EP_TB_TS.01 | 4.1.3 | M | After clicking one of the template buttons, camera message is appearing. |

| TC ID | Requirements | Priority | Scenario Description |
|-----------------|--------------|----------|-------------------------------------------------------------------------|
| GUI.EP_NP_TS.01 | 4.1.3 | H | After clicking the numpad, clicked numbers is appearing on the textbox. |

| TC ID | Requirements | Priority | Scenario Description |
|--------------------|--------------|----------|-------------------------------------------------------------------------------------|
| GUI.EP_NP_DB_TS.01 | 4.1.3 | M | After clicking the del button on numpad, the last number on the textbox is deleted. |

| TC ID | Requirements | Priority | Scenario Description |
|--------------------|--------------|----------|-------------------------------------------------------------------------------------|
| GUI.EP_NP_RB_TS.01 | 4.1.3 | M | After clicking the res button on numpad, all the numbers on the textbox is deleted. |

| TC ID | Requirements | Priority | Scenario Description |
|--------------|--------------|----------|------------------------------------------------------------------------------------------------------|
| GUI.AP_TS.01 | 4.1.3 | H | After clicking left or right arrow button, announcements published by the teacher will be displayed. |

| TC ID | Requirements | Priority | Scenario Description |
|-------------------|--------------|----------|----------------------------------------------------------------------------------------|
| GUI.LGN_BTN_WS.01 | 4.1.1 | H | After clicking the “Login” button, email address and password boxes will be displayed. |

| TC ID | Requirements | Priority | Scenario Description |
|------------------|--------------|----------|------------------------------------------------------------------|
| GUI.EM_BTN_WS.01 | 4.1.1 | H | After clicking the “Email” button, Email page will be displayed. |

| TC ID | Requirements | Priority | Scenario Description |
|----------------------|--------------|----------|------------------------------------------------------------------|
| GUI.EM_INB_BTN_WS.01 | 4.1.1 | H | After clicking the “Inbox” button, Inbox page will be displayed. |

| TC ID | Requirements | Priority | Scenario Description |
|----------------------|--------------|----------|-------------------------------------------------------------------------------|
| GUI.IP_SLC_BTN_WS.01 | 4.1.1 | M | After clicking the “Select” button, Reply and Exit buttons will be displayed. |

| TC ID | Requirements | Priority | Scenario Description |
|----------------------|--------------|----------|----------------------------------------------------------------------------------------------------------|
| GUI.IP_REP_BTN_WS.01 | 4.1.1 | M | After clicking the “Reply” button, receiver, subject and content textboxes with send button will appear. |

| TC ID | Requirements | Priority | Scenario Description |
|----------------------|--------------|----------|-----------------------------------------------------------------------|
| GUI.IP_SND_BTN_WS.01 | 4.1.1 | M | All the textboxes are filled, and the message is sent to the student. |
| GUI.IP_SND_BTN_WS.02 | 4.1.1 | M | Subject textbox is not filled, and error message is displayed. |
| GUI.IP_SND_BTN_WS.03 | 4.1.1 | M | Content textbox is not filled, and error message is displayed. |

| TC ID | Requirements | Priority | Scenario Description |
|--------------------------|--------------|----------|----------------------------------------------------------------------------|
| GUI. IP_EXT_BTN_WS.01 | 4.1.1 | L | Reply and Exit buttons are disappeared and the select button is displayed. |

| TC ID | Requirements | Priority | Scenario Description |
|--------------------------|--------------|----------|---------------------------------------|
| GUI. IP_DEL_BTN_WS.01 | 4.1.1 | M | Selected email is moved to the trash. |

| TC ID | Requirements | Priority | Scenario Description |
|----------------------------|--------------|----------|--------------------------------------------------------------------------|
| GUI. GULEM_SM_BTN_WS.01 | 4.1.1 | H | After clicking the “Sent Mail” button, Sent Mail page will be displayed. |

| TC ID | Requirements | Priority | Scenario Description |
|--------------------------|--------------|----------|---------------------------------------|
| GUI. SM_DEL_BTN_WS.01 | 4.1.1 | M | Selected email is moved to the trash. |

| TC ID | Requirements | Priority | Scenario Description |
|-----------------------------|--------------|----------|------------------------------------------------------------------|
| GUI. GULEM_TRS_BTN_WS.01 | 4.1.1 | H | After clicking the “Trash” button, Trash page will be displayed. |

| TC ID | Requirements | Priority | Scenario Description |
|-----------------------|--------------|----------|----------------------------------------|
| GUI.TRS_DEL_BTN_WS.01 | 4.1.1 | L | Selected email is permanently deleted. |

| TC ID | Requirements | Priority | Scenario Description |
|---------------------|--------------|----------|-----------------------------------------------------------------------------------------|
| GULEM_WBM_BTN_WS.01 | 4.1.1 | L | After clicking the “Webmail” button, Çankaya University Webmail page will be displayed. |

| TC ID | Requirements | Priority | Scenario Description |
|-----------------|--------------|----------|---------------------------------------------------------------------------------|
| GUI.A_BTN_WS.01 | 4.1.1 | H | After clicking the “Announcements” button, Announcement page will be displayed. |

| TC ID | Requirements | Priority | Scenario Description |
|--------------------|--------------|----------|---------------------------------------------------------------------------------------------------|
| GUILA_AA_BTN_WS.01 | 4.1.1 | H | After clicking the “All Announcements” button, all the published announcements will be displayed. |

| TC ID | Requirements | Priority | Scenario Description |
|--------------------|--------------|----------|--------------------------------------------------------------------------------------------|
| GUILA_EA_BTN_WS.01 | 4.1.1 | M | After clicking the “Edit Announcements” button, edit announcements page will be displayed. |

| TC ID | Requirements | Priority | Scenario Description |
|---------------------|--------------|----------|--------------------------------------------------------------------------------|
| GULEA_SLC_BTN_WS.01 | 4.1.1 | M | After clicking the “Select” button, update and exit buttons will be displayed. |

| TC ID | Requirements | Priority | Scenario Description |
|--------------------|--------------|----------|-----------------------------------------------------------------------------------------------------|
| GULEA_UA_BTN_WS.01 | 4.1.1 | M | After clicking the “Update” button, edit textboxes for the selected announcement will be displayed. |

| TC ID | Requirements | Priority | Scenario Description |
|---------------------|--------------|----------|----------------------------------------------------------------|
| GULEA_EXT_BTN_WS.01 | 4.1.1 | M | After clicking the “Exit” button, select button will reappear. |

| TC ID | Requirements | Priority | Scenario Description |
|--------------------|--------------|----------|----------------------------------------------------------------------------------------------------------------|
| GULEA_RM_BTN_WS.01 | 4.1.1 | M | After clicking the “Remove” button, selected announcement is removed from the list. |
| GULEA_RM_BTN_WS.02 | 4.1.1 | M | After clicking the “Remove” button, selected announcement is not removed from the list and is still displayed. |

| TC ID | Requirements | Priority | Scenario Description |
|--------------------|--------------|----------|----------------------------------------------------------------------------------------|
| GUILA_NA_BTN_WS.01 | 4.1.1 | M | After clicking the “New Announcement” button, new announcement page will be displayed. |

| TC ID | Requirements | Priority | Scenario Description |
|--------------------------|--------------|----------|-------------------------------------------------------------------------------------|
| GUI.NA_PBL_B TN_WS.01 | 4.1.1 | M | Content textbox is filled, expire date is chosen and the announcement is published. |
| GUI.NA_PBL_B TN_WS.02 | 4.1.1 | M | Content textbox is not filled, and error message is displayed. |
| GUI.NA_PBL_B TN_WS.03 | 4.1.1 | M | Expire date is not chosen, and error message is displayed. |

| TC ID | Requirements | Priority | Scenario Description |
|----------------------|--------------|----------|--------------------------------------------------------------------------|
| GUI. ET_BTN_WS.01 | 4.1.1 | H | After clicking the “Timetable” button, Timetable page will be displayed. |

| TC ID | Requirements | Priority | Scenario Description |
|--------------------------|--------------|----------|----------------------------------------------------------------------|
| GUI.TP_ADD_B TN_WS.01 | 4.1.1 | H | Day, hour, content chosen, and extra hour is added to the timetable. |
| GUI.TP_ADD_B TN_WS.02 | 4.1.1 | H | Day is not chosen, and error message is displayed. |
| GUI.TP_ADD_B TN_WS.03 | 4.1.1 | H | Hour is not chosen, and error message is displayed. |
| GUI.TP_ADD_B TN_WS.04 | 4.1.1 | H | Content is not chosen, and error message is displayed. |

| TC ID | Requirements | Priority | Scenario Description |
|--------------------------|--------------|----------|-------------------------------------------------------------------------------------------------------------|
| GUI.TP_RES_BT N_WS.01 | 4.1.1 | H | After clicking the “Reset” button, all the previously added extra hours will be deleted from the timetable. |

| TC ID | Requirements | Priority | Scenario Description |
|----------------------|--------------|----------|----------------------------------------------------------------------------------|
| GUI. LG_BTN_WS.01 | 4.1.1 | L | After clicking the “Logout” button, the user will be logged out from the system. |

| TC ID | Requirements | Priority | Scenario Description |
|----------------------|--------------|----------|-------------------------------------------------------------------------------|
| GUI. VD_BTN_WS.01 | 4.1.1 | H | After clicking the “Verify the Device” button, verify page will be displayed. |

| TC ID | Requirements | Priority | Scenario Description |
|----------------------------|--------------|----------|-----------------------------------------------------------------------------------------------------------------------------|
| GUI. VD_V_BTN_WS. 01 | 4.1.1 | H | After entering a code for the device and clicking the verify button, the device will be added as available to the database. |

| TC ID | Requirements | Priority | Scenario Description |
|----------------------|--------------|----------|---------------------------------------------------------------------------|
| GUI. AT_BTN_WS.01 | 4.1.1 | H | After clicking the “Add a Teacher” button, adding page will be displayed. |

| TC ID | Requirements | Priority | Scenario Description |
|----------------------------|--------------|----------|-------------------------------------------------------------------------------------------------------------------------------------------|
| GUI. AT_M_BTN_WS. 01 | 4.1.1 | H | After selecting a teacher and a device from the dropdown lists and clicking the match button, the teacher and the device will be matched. |

| TC ID | Requirements | Priority | Scenario Description |
|------------------|--------------|----------|-----------------------------------------------------------------------------------------------------------------|
| GUI.HP_BTN_WS.01 | 4.1.1 | H | After clicking the “Homepage” button, teacher or admin homepage, according to the user type, will be displayed. |

| TC ID | Requirements | Priority | Scenario Description |
|-----------------------|--------------|----------|----------------------------------------------------------------------------------------|
| GUI. LGN_BTN_MA.01 | 4.1.2 | H | After clicking the “Login” button, email address and password boxes will be displayed. |

| TC ID | Requirements | Priority | Scenario Description |
|----------------------|--------------|----------|------------------------------------------------------------------------|
| GUI. EM_BTN_MA.01 | 4.1.2 | H | After clicking the “Check Email” button, Email page will be displayed. |

| TC ID | Requirements | Priority | Scenario Description |
|--------------------------|--------------|----------|--------------------------------------------------------------------------------------------------------------------------|
| GUI. EP_REP_BTN_MA.01 | 4.1.2 | H | After entering a content, subject and the student’s email address and clicking the reply button, the email will be sent. |

| TC ID | Requirements | Priority | Scenario Description |
|---------------------|--------------|----------|---------------------------------------------------------------------------------|
| GUI. A_BTN_MA.01 | 4.1.2 | H | After clicking the “Announcements” button, Announcement page will be displayed. |

| TC ID | Requirements | Priority | Scenario Description |
|--------------------|--------------|----------|------------------------------------------------------------------------------------------------------|
| GUI.A_PA_BTN_MA.01 | 4.1.2 | H | After clicking the “Publish an Announcement” button, publish an announcement page will be displayed. |

| TC ID | Requirements | Priority | Scenario Description |
|--------------------|--------------|----------|------------------------------------------------------------------------------------------------------------------------------|
| GUI.PA_P_BTN_MA.01 | 4.1.2 | H | After entering a content, selecting an expiry date and clicking on the publish button, a new announcement will be published. |

| TC ID | Requirements | Priority | Scenario Description |
|---------------------|--------------|----------|----------------------------------------------------------------------------------------|
| GUI.A_EDT_BTN_MA.01 | 4.1.2 | H | After clicking the edit announcement button, edit announcement page will be displayed. |

| TC ID | Requirements | Priority | Scenario Description |
|--------------------|--------------|----------|----------------------------------------------------------------------------------------------------|
| GUI.EA_U_BTN_MA.01 | 4.1.2 | H | After entering a new content and clicking the update button, the selected announcement is updated. |

| TC ID | Requirements | Priority | Scenario Description |
|----------------------|--------------|----------|----------------------------------------------------------------------|
| GUI.EA_DEL_BTN_MA.01 | 4.1.2 | H | A selected announcement is deleted after clicking the delete button. |

| TC ID | Requirements | Priority | Scenario Description |
|-----------------|--------------|----------|--------------------------------------------------------------------------|
| GUI.T_BTN_MA.01 | 4.1.2 | H | After clicking the “Timetable” button, Timetable page will be displayed. |

| TC ID | Requirements | Priority | Scenario Description |
|--------------------|--------------|----------|-----------------------------------------------------------------------------------|
| GUI.TP_T_BTN_MA.01 | 4.1.2 | H | After clicking the “Tuesday” button, the timetable for Tuesday will be displayed. |

| TC ID | Requirements | Priority | Scenario Description |
|--------------------|--------------|----------|---------------------------------------------------------------------------------------|
| GUI.TP_W_BTN_MA.01 | 4.1.2 | H | After clicking the “Wednesday” button, the timetable for Wednesday will be displayed. |

| TC ID | Requirements | Priority | Scenario Description |
|-------------------------|--------------|----------|-------------------------------------------------------------------------------------|
| GUI. TP_TH_BTN_MA.01 | 4.1.2 | H | After clicking the “Thursday” button, the timetable for Thursday will be displayed. |

| TC ID | Requirements | Priority | Scenario Description |
|------------------------|--------------|----------|---------------------------------------------------------------------------------|
| GUI. TP_F_BTN_MA.01 | 4.1.2 | H | After clicking the “Friday” button, the timetable for Friday will be displayed. |

| TC ID | Requirements | Priority | Scenario Description |
|--------------------------|--------------|----------|----------------------------------------------------------------------|
| GUI. TP_ADD_BTN_MA.01 | 4.1.2 | H | Day, hour, content chosen, and extra hour is added to the timetable. |
| GUI. TP_ADD_BTN_MA.02 | 4.1.2 | H | Day is not chosen, and error message is displayed. |
| GUI. TP_ADD_BTN_MA.03 | 4.1.2 | H | Hour is not chosen, and error message is displayed. |
| GUI. TP_ADD_BTN_MA.04 | 4.1.2 | H | Content is not chosen, and error message is displayed. |

| TC ID | Requirements | Priority | Scenario Description |
|----------------------|--------------|----------|----------------------------------------------------------------------------------|
| GUI. LG_BTN_MA.01 | 4.1.2 | L | After clicking the “Logout” button, the user will be logged out from the system. |

6.5.2 Mobile Application (MA)

6.5.2.1 Sub features to be tested

- Login (MA.LGN)

When entering the system, login page will appear. To access further features login operation must be successful.

- Email (MA.EM)

The name of the sender, time sent, the content of the email and the photograph of the sender will be displayed to the teacher. Also, teachers can send replies to those emails or delete them.

- Announcement (MA.AN)

Teachers can see all the announcements published before, publish a new one and delete or edit a published one.

- Timetable (MA.TT)

Teachers can see their current time table and make changes on it.

6.5.2.2 Test Cases

| TC ID | Requirements | Priorty | Scenario Description |
|---------------|--------------|---------|------------------------------------------------------|
| MA.LG N.01 | 4.1.2 | L | Enter a valid password and email address. |
| MA.LG N.02 | 4.1.2 | L | Enter a valid password and invalid email address. |
| MA.LG N.03 | 4.1.2 | L | Enter an invalid password and a valid email address. |
| MA.LG N.04 | 4.1.2 | L | Enter an invalid password and email address. |

| TC ID | Requirements | Priorty | Scenario Description |
|--------------|--------------|---------|----------------------------------------------------------------------------------------------------------------|
| MA.EM. 01 | 4.1.2 | H | Email Page will be displayed with the time sent, name of the sender, content and the photograph of the sender. |

| TC ID | Requirements | Priority | Scenario Description |
|----------|--------------|----------|---------------------------------------------------------------------------------------------------------|
| MA.AN.01 | 4.1.2 | M | All the published announcements with their dates and contents will be displayed. |
| MA.AN.02 | 4.1.2 | H | By using the textbox and the button, teacher can published a new announcement. |
| MA.AN.03 | 4.1.2 | M | By using the gridview buttons and edit textboxes, teacher can delete or update published announcements. |

| TC ID | Requirements | Priority | Scenario Description |
|----------|--------------|----------|----------------------------------------------------------------------------|
| MA.TT.01 | 4.1.2 | H | Teacher's timetable with lectures and times will be displayed. |
| MA.TT.02 | 4.1.2 | M | By clicking on a box in the timetable, teacher can edit his/her timetable. |

6.5.3 Website (WS)

6.5.3.1 Sub features to be tested

- Login (WS.LGN)

When entering the system, login page will appear. To access further features login operation must be successful.

- Email (WS.EM)

The name of the sender, time sent and the content of the email will be displayed to the teacher. Also, teachers can send replies to those emails.

- Announcement (WS.AN)

Teachers can see all the announcements publish before and publish a new one.

- Timetable (WS.TT)

Teachers can see their current time table and make changes on it.

- Add a Teacher (WS.AT)

Admins can add a teacher to the database for a device usage.

- Verify the Device (WS.VD)

Admins can verify a newly registered device.

6.5.3.2 Test Cases

| TC ID | Requirements | Priority | Scenario Description |
|-----------|--------------|----------|------------------------------------------------------|
| WS.LGN.01 | 4.1.1 | L | Enter a valid password and email address. |
| WS.LGN.02 | 4.1.1 | L | Enter a valid password and invalid email address. |
| WS.LGN.03 | 4.1.1 | L | Enter an invalid password and a valid email address. |
| WS.LGN.04 | 4.1.1 | L | Enter an invalid password and email address. |

| TC ID | Requirements | Priority | Scenario Description |
|----------|--------------|----------|----------------------------------------------------------------------------------------------------------------|
| WS.EM.01 | 4.1.1 | H | Email Page will be displayed with the time sent, name of the sender, content and the photograph of the sender. |

| TC ID | Requirements | Priority | Scenario Description |
|----------|--------------|----------|---------------------------------------------------------------------------------------------------------|
| WS.AN.01 | 4.1.1 | M | All the published announcements with their dates and contents will be displayed. |
| WS.AN.02 | 4.1.1 | H | By using the textbox and the button, teacher can published a new announcement. |
| WS.AN.03 | 4.1.1 | M | By using the gridview buttons and edit textboxes, teacher can delete or update published announcements. |

| TC ID | Requirements | Priority | Scenario Description |
|----------|--------------|----------|----------------------------------------------------------------------------|
| WS.TT.01 | 4.1.1 | H | Teacher's timetable with lectures and times will be displayed. |
| WS.TT.02 | 4.1.1 | M | By clicking on a box in the timetable, teacher can edit his/her timetable. |

| TC ID | Requirements | Priority | Scenario Description |
|----------|--------------|----------|--------------------------------------------------------------------------------|
| WS.AT.01 | 4.1.1 | L | By using the drop down list, an admin can add and match teachers with devices. |

| TC ID | Requirements | Priority | Scenario Description |
|----------|--------------|----------|-------------------------------------------------------------------|
| WS.VD.01 | 4.1.1 | L | By giving a unique ID to the device, admin can verify the device. |

6.5.4 Connection (CNC)

6.5.4.1 Sub features to be tested

- Database (CNC.DB)

To get certain information, database connection must be enabled.

- Web Server (CNC.WSVR)

To enable real time communication, connection to a web server with a protocol must be enabled.

6.5.4.2 Test Cases

| TC ID | Requirements | Priority | Scenario Description |
|---------------|--------------|----------|------------------------|
| CNC.DB .01 | 4.1.3 | H | Connection is enabled. |

| TC ID | Requirements | Priority | Scenario Description |
|-----------------|--------------|----------|------------------------|
| CNC.WS VR.01 | 4.1.3 | H | Conneciton is enabled. |

6.5.5 Equipment (EQ)

6.5.5.1 Sub features to be tested

- Motion Sensor (EQ.MS)

The device will get into sleep mode when there is no one in front of it and it will start to operate if someone comes in front of it.

- Camera (EQ.CMR)

When someone chooses to send an email to the teacher, the camera will take the picture of him/her.

6.5.5.2 Test Cases

| TC ID | Requirements | Priority | Scenario Description |
|----------|--------------|----------|----------------------------------------------------|
| EQ.MS.01 | 4.1.3 | M | When there is no one, the screen has been closed. |
| EQ.MS.02 | 4.1.3 | M | When there is someone, the screen has been opened. |

| TC ID | Requirements | Priority | Scenario Description |
|-----------|--------------|----------|--------------------------|
| EQ.CMR.01 | 4.1.3 | L | The photograph is taken. |

6.6 Detail Test Cases

6.6.1 GUI.R_BTN.01

| | |
|-----------------------|----------------------------------------------------------------------------------------------------------------------------------|
| TC_ID | GUI.R_BTN.01 |
| Purpose | Page is changed correctly. |
| Requirements | 4.1.3 |
| Priority | Low. |
| Estimated Time Needed | 2 Seconds. |
| Dependency | The screen is opened. |
| Setup | All the panels on the touchscreen are prepared. |
| Procedure | [A01] Stay in front of the device. [A02] Click the “Right Arrow” button. [V01] Observe that the page is changed correctly. |
| Cleanup | Go back to main page. |

6.6.2 GUI.L_BTN.01

| | |
|-----------------------|---------------------------------------------------------------------------------------------------------------------------------|
| TC_ID | GUI.L_BTN.01 |
| Purpose | Page is changed correctly. |
| Requirements | 4.1.3 |
| Priority | Low. |
| Estimated Time Needed | 2 Seconds. |
| Dependency | The screen is opened. |
| Setup | All the panels on the touchscreen are prepared. |
| Procedure | [A01] Stay in front of the device. [A02] Click the “Left Arrow” button. [V01] Observe that the page is changed correctly. |
| Cleanup | Go back to main page. |

6.6.3 GUI.TP_TS.01

| | |
|------------------------------|------------------------------------------------------------------------|
| TC_ID | GUI.TP_TS.01 |
| Purpose | The timetable is displayed on the screen to the students. |
| Requirements | 4.1.3 |
| Priority | High. |
| Estimated Time Needed | 2 Seconds. |
| Dependency | The screen is opened. |
| Setup | The timetable panel on the touchscreen is prepared. |
| Procedure | [A01] Stay in front of the device. |
| | [V01] Observe that the timetable is appearing on the screen correctly. |
| Cleanup | Go back to sleep mode. |

6.6.4 GUI.EP_TS.01

| | |
|------------------------------|------------------------------------------------------------------------------------------------------|
| TC_ID | GUI.EP_TS.01 |
| Purpose | All message templates, email address textbox and numpad are displayed on the screen to the students. |
| Requirements | 4.1.3 |
| Priority | High. |
| Estimated Time Needed | 2 Seconds. |
| Dependency | Right or left arrow button is clicked. |
| Setup | The email panel on the touchscreen is prepared. |
| Procedure | [A01] Stay in front of the device. |
| | [A02] Click the right/left arrow button. |
| | [V01] Observe that the email panel is appearing on the screen correctly. |
| Cleanup | Go back to main page. |

6.6.5 GUI.EP_TS.02

| | |
|------------------------------|-----------------------------------------------------------|
| TC_ID | GUI.EP_TS.02 |
| Purpose | Enter a valid email address. |
| Requirements | 4.1.3 |
| Priority | Medium. |
| Estimated Time Needed | 15 Seconds. |
| Dependency | Database connection is enabled. |
| Setup | The email panel on the touchscreen is prepared. |
| Procedure | [A01] Stay in front of the device. |
| | [A02] Enter the valid email address. |
| | [V01] Observe that “Email is valid” message is displayed. |
| Cleanup | Go back to main page. |

6.6.6 GUI.EP_TS.03

| | |
|------------------------------|-------------------------------------------------------------------|
| TC_ID | GUI.EP_TS.03 |
| Purpose | Enter an invalid email address. |
| Requirements | 4.1.3 |
| Priority | Medium. |
| Estimated Time Needed | 15 Seconds. |
| Dependency | Database connection is enabled. |
| Setup | The email panel on the touchscreen is prepared. |
| Procedure | [A01] Stay in front of the device. |
| | [A02] Enter the invalid email address. |
| | [V01] Observe that “Email is invalid” error message is displayed. |
| Cleanup | Go back to main page. |

6.6.7 GUI.EP_NP_TS.01

| | |
|------------------------------|----------------------------------------------------------|
| TC_ID | GUI.EP_NP_TS.01 |
| Purpose | Clicked numbers is appearing on the textbox. |
| Requirements | 4.1.3 |
| Priority | High. |
| Estimated Time Needed | 3 Seconds. |
| Dependency | A number on the numpad is clicked. |
| Setup | The email panel on the touchscreen is prepared. |
| Procedure | [A01] Stay in front of the device. |
| | [A02] Enter the student number. |
| | [V01] Observe that numbers are appearing on the textbox. |
| Cleanup | Go back to main page. |

6.6.8 GUI.EP_NP_DB_TS.01

| | |
|------------------------------|-------------------------------------------------------------------------|
| TC_ID | GUI.EP_NP_DB_TS.01 |
| Purpose | Last number entered on the textbox is deleted. |
| Requirements | 4.1.3 |
| Priority | Medium. |
| Estimated Time Needed | 3 Seconds. |
| Dependency | Del button on the numpad is clicked. |
| Setup | The email panel on the touchscreen is prepared. |
| Procedure | [A01] Stay in front of the device. |
| | [A02] Enter a number to the textbox. |
| | [V01] Observe that the last number entered is deleted from the textbox. |
| Cleanup | Go back to main page. |

6.6.9 GUI.EP_NP_RB_TS.01

| | |
|------------------------------|--------------------------------------------------------------------------|
| TC_ID | GUI.EP_NP_RB_TS.01 |
| Purpose | All the numbers entered are deleted from the textbox. |
| Requirements | 4.1.3 |
| Priority | Medium. |
| Estimated Time Needed | 3 Seconds. |
| Dependency | Res button on the numpad is clicked. |
| Setup | The email panel on the touchscreen is prepared. |
| Procedure | [A01] Stay in front of the device. |
| | [A02] Enter numbers to the textbox. |
| | [V01] Observe that all the numbers entered are deleted from the textbox. |
| Cleanup | Go back to main page. |

6.6.10 GUI.EP_TB_TS.01

| | |
|------------------------------|-------------------------------------------------------------------|
| TC_ID | GUI.EP_TB_TS.01 |
| Purpose | Camera message is appearing. |
| Requirements | 4.1.3 |
| Priority | Medium. |
| Estimated Time Needed | 3 Seconds. |
| Dependency | A template button is clicked. |
| Setup | The email panel on the touchscreen is prepared. |
| Procedure | [A01] Stay in front of the device. |
| | [A02] Enter student number to the textbox. |
| | [A03] Select a template message. |
| | [V01] Observe that the camera message is appearing on the screen. |
| Cleanup | Go back to main page. |

6.6.11 GUI.AP_TS.01

| | |
|------------------------------|---------------------------------------------------------------------------------|
| TC_ID | GUI.AP_TS.01 |
| Purpose | All announcements and their date are displayed on the screen to the students. |
| Requirements | 4.1.3 |
| Priority | High. |
| Estimated Time Needed | 2 Seconds. |
| Dependency | Right or left arrow button is clicked. |
| Setup | The announcement panel on the touchscreen is prepared. |
| Procedure | [A01] Stay in front of the device. |
| | [A02] Click the right/left arrow button. |
| | [V01] Observe that the announcement panel is appearing on the screen correctly. |
| Cleanup | Go back to main page. |

6.6.12 GUI.LGN_BTN_WS.01

| | |
|------------------------------|-------------------------------------------------------------------------------------|
| TC_ID | GUI.LGN_BTN_WS.01 |
| Purpose | Email and password textboxes are displayed on the website to the teacher and admin. |
| Requirements | 4.1.1 |
| Priority | High. |
| Estimated Time Needed | 2 Seconds. |
| Dependency | The browser is opened. |
| Setup | The login page on the website is prepared. |
| Procedure | [A01] Open the browser. |
| | [A02] Enter the link of the website. |
| | [A03] Click the “Login” Button. |
| | [V01] Observe that the login page is appearing correctly. |
| Cleanup | Go back to homepage. |

6.6.13 GUI.EM_BTN_WS.01

| | |
|------------------------------|-----------------------------------------------------------|
| TC_ID | GUI.EM_BTN_WS.01 |
| Purpose | Emails Page is opened on the website. |
| Requirements | 4.1.1 |
| Priority | High. |
| Estimated Time Needed | 5 Seconds. |
| Dependency | The teacher is logged in to the system. |
| Setup | The user homepage on the website is prepared. |
| Procedure | [A01] Login to the system. |
| | [A02] Click the “Email” Button. |
| | [V01] Observe that the Email Page is appearing correctly. |
| Cleanup | Go back to user homepage. |

6.6.14 GUI.EM_INB_BTN_WS.01

| | |
|------------------------------|----------------------------------------------------------------------------|
| TC_ID | GUI.EM_INB_BTN_WS.01 |
| Purpose | Inbox page is displayed. |
| Requirements | 4.1.1 |
| Priority | High. |
| Estimated Time Needed | 5 Seconds. |
| Dependency | The teacher is logged in to the system and database connection is enabled. |
| Setup | The email page is prepared. |
| Procedure | [A01] Login to the system. |
| | [A02] Click the “Email” Button. |
| | [A03] Click the “Inbox” Button. |
| | [V01] Observe that the Inbox page with received emails is displayed. |
| Cleanup | Go back to user homepage. |

6.6.15 GUI.IP_SLC_BTN_WS.01

| | |
|------------------------------|----------------------------------------------------------------------------|
| TC_ID | GUI.IP_SLC_BTN_WS.01 |
| Purpose | Reply and Exit buttons are displayed. |
| Requirements | 4.1.1 |
| Priority | Medium. |
| Estimated Time Needed | 5 Seconds. |
| Dependency | The teacher is logged in to the system and database connection is enabled. |
| Setup | The inbox page is prepared. |
| Procedure | [A01] Login to the system. |
| | [A02] Click the “Email” Button. |
| | [A03] Click the “Inbox” Button. |
| | [A04] Click the “Select” Button. |
| | [V01] Observe that the Reply and Exit buttons are displayed. |
| Cleanup | Go back to user homepage. |

6.6.16 GUI.IP_REP_BTN_WS.01

| | |
|------------------------------|-----------------------------------------------------------------------------------------------------|
| TC_ID | GUI.IP_REP_BTN_WS.01 |
| Purpose | Receiver, subject and content textboxes with send button will appear. |
| Requirements | 4.1.1 |
| Priority | Medium. |
| Estimated Time Needed | 5 Seconds. |
| Dependency | The teacher is logged in to the system and database connection is enabled. |
| Setup | The inbox page is prepared. |
| Procedure | [A01] Login to the system. |
| | [A02] Click the “Email” Button. |
| | [A03] Click the “Inbox” Button. |
| | [A04] Click the “Select” Button. |
| | [A05] Click the “Reply” Button. |
| | [V01] Observe that receiver, subject and content textboxes with send button is appearing correctly. |
| Cleanup | Go back to user homepage. |

6.6.17 GUI.IP_SND_BTN_WS.01

| | |
|------------------------------|----------------------------------------------------------------------------|
| TC_ID | GUI.IP_SND_BTN_WS.01 |
| Purpose | All the textboxes are filled and mail is sent to the student correctly. |
| Requirements | 4.1.1 |
| Priority | Medium. |
| Estimated Time Needed | 5 Seconds. |
| Dependency | The teacher is logged in to the system and database connection is enabled. |
| Setup | The inbox page is prepared. |
| Procedure | [A01] Login to the system. |
| | [A02] Click the “Email” Button. |
| | [A03] Click the “Inbox” Button. |
| | [A04] Click the “Select” Button. |
| | [A05] Click the “Reply” Button. |
| | [A06] Click the “Send” Button. |
| | [V01] Observe that the email is sent to the student without any errors. |
| Cleanup | Go back to user homepage. |

6.6.18 GUI.IP_SND_BTN_WS.02

| | |
|------------------------------|-----------------------------------------------------------------------------|
| TC_ID | GUI.IP_SND_BTN_WS.02 |
| Purpose | Subject textbox is not filled, and error message is displayed. |
| Requirements | 4.1.1 |
| Priority | Medium. |
| Estimated Time Needed | 5 Seconds. |
| Dependency | The teacher is logged in to the system and database connection is enabled. |
| Setup | The inbox page is prepared. |
| Procedure | [A01] Login to the system. |
| | [A02] Click the “Email” Button. |
| | [A03] Click the “Inbox” Button. |
| | [A04] Click the “Select” Button. |
| | [A05] Click the “Reply” Button. |
| | [A06] Click the “Send” Button. |
| | [V01] Observe that the email is not sent to the student without any errors. |
| Cleanup | Go back to user homepage. |

6.6.19 GUI.IP_SND_BTN_WS.03

| | |
|------------------------------|-----------------------------------------------------------------------------|
| TC_ID | GUI.IP_SND_BTN_WS.03 |
| Purpose | Content textbox is not filled, and error message is displayed. |
| Requirements | 4.1.1 |
| Priority | Medium. |
| Estimated Time Needed | 5 Seconds. |
| Dependency | The teacher is logged in to the system and database connection is enabled. |
| Setup | The inbox page is prepared. |
| Procedure | [A01] Login to the system. |
| | [A02] Click the “Email” Button. |
| | [A03] Click the “Inbox” Button. |
| | [A04] Click the “Select” Button. |
| | [A05] Click the “Reply” Button. |
| | [A06] Click the “Send” Button. |
| | [V01] Observe that the email is not sent to the student without any errors. |
| Cleanup | Go back to user homepage. |

6.6.20 GUI.IP_EXT_BTN_WS.01

| | |
|------------------------------|------------------------------------------------------------------------------------------|
| TC_ID | GUI.IP_EXT_BTN_WS.01 |
| Purpose | Reply and Exit buttons are disappeared and Select button is reappearing on the gridview. |
| Requirements | 4.1.1 |
| Priority | Low. |
| Estimated Time Needed | 3 Seconds. |
| Dependency | The teacher is logged in to the system and database connection is enabled. |
| Setup | The inbox page is prepared. |
| Procedure | [A01] Login to the system. |
| | [A02] Click the “Email” Button. |
| | [A03] Click the “Inbox” Button. |
| | [A04] Click the “Select” Button. |
| | [A05] Click the “Exit” Button. |
| | [V01] Observe that the select button is reappearing on the gridview. |
| Cleanup | Go back to user homepage. |

6.6.21 GUI.IP_DEL_BTN_WS.01

| | |
|------------------------------|----------------------------------------------------------------------------|
| TC_ID | GUI.IP_DEL_BTN_WS.01 |
| Purpose | Selected email(s) are moved to the trash. |
| Requirements | 4.1.1 |
| Priority | Medium. |
| Estimated Time Needed | 5 Seconds. |
| Dependency | The teacher is logged in to the system and database connection is enabled. |
| Setup | The inbox page is prepared. |
| Procedure | [A01] Login to the system. |
| | [A02] Click the “Email” Button. |
| | [A03] Click the “Inbox” Button. |
| | [A04] Mark email checkboxes. |
| | [A05] Click the “Delete” Button. |
| | [V01] Observe that the selected email(s) are moved to the trash. |
| Cleanup | Go back to user homepage. |

6.6.22 GUI.EM_SM_BTN_WS.01

| | |
|------------------------------|---------------------------------------------------------------------------------|
| TC_ID | GUI.EM_SM_BTN_WS.01 |
| Purpose | Sent Mail page is displayed. |
| Requirements | 4.1.1 |
| Priority | High. |
| Estimated Time Needed | 5 Seconds. |
| Dependency | The teacher is logged in to the system and database connection is enabled. |
| Setup | The email page is prepared. |
| Procedure | [A01] Login to the system. |
| | [A02] Click the “Email” Button. |
| | [A03] Click the “Sent Mail” Button. |
| | [V01] Observe that the Sent mail page with previously sent emails is displayed. |
| | Go back to user homepage. |
| Cleanup | Inbox page is displayed. |

6.6.23 GUI.SM_DEL_BTN_WS.01

| | |
|------------------------------|----------------------------------------------------------------------------|
| TC_ID | GUI.SM_DEL_BTN_WS.01 |
| Purpose | Selected email(s) are moved to the trash. |
| Requirements | 4.1.1 |
| Priority | Medium. |
| Estimated Time Needed | 5 Seconds. |
| Dependency | The teacher is logged in to the system and database connection is enabled. |
| Setup | The sent mail page is prepared. |
| Procedure | [A01] Login to the system. |
| | [A02] Click the “Email” Button. |
| | [A03] Click the “Sent Mail” Button. |
| | [A04] Mark email checkboxes. |
| | [A05] Click the “Delete” Button. |
| | [V01] Observe that the selected email(s) are moved to the trash. |
| Cleanup | Go back to user homepage. |

6.6.24 GUI.EM_TRS_BTN_WS.01

| | |
|------------------------------|----------------------------------------------------------------------------|
| TC_ID | GUI.EM_TRS_BTN_WS.01 |
| Purpose | Trash page is displayed. |
| Requirements | 4.1.1 |
| Priority | High. |
| Estimated Time Needed | 5 Seconds. |
| Dependency | The teacher is logged in to the system and database connection is enabled. |
| Setup | The email page is prepared. |
| Procedure | [A01] Login to the system. |
| | [A02] Click the “Email” Button. |
| | [A03] Click the “Trash” Button. |
| | [V01] Observe that the Trash page with deleted emails is displayed. |
| Cleanup | Go back to user homepage. |

6.6.25 GUI.TRS_DEL_BTN_WS.01

| | |
|------------------------------|----------------------------------------------------------------------------|
| TC_ID | GUI.TRS_DEL_BTN_WS.01 |
| Purpose | Selected email(s) are permanently deleted. |
| Requirements | 4.1.1 |
| Priority | Low. |
| Estimated Time Needed | 5 Seconds. |
| Dependency | The teacher is logged in to the system and database connection is enabled. |
| Setup | The trash page is prepared. |
| Procedure | [A01] Login to the system. |
| | [A02] Click the “Email” Button. |
| | [A03] Click the “Trash” Button. |
| | [A04] Mark email checkboxes. |
| | [A05] Click the “Delete” Button. |
| | [V01] Observe that the selected email(s) are permanently deleted. |
| Cleanup | Go back to user homepage. |

6.6.26 GUI.EM_WBM_BTN_WS.01

| | |
|------------------------------|----------------------------------------------------------------------------|
| TC_ID | GUI.EM_WBM_BTN_WS.01 |
| Purpose | Cankaya University Webmail page is displayed. |
| Requirements | 4.1.1 |
| Priority | Low. |
| Estimated Time Needed | 5 Seconds. |
| Dependency | The teacher is logged in to the system and database connection is enabled. |
| Setup | The email page is prepared. |
| Procedure | [A01] Login to the system. |
| | [A02] Click the “Email” Button. |
| | [A03] Click the “Webmail” Button. |
| | [V01] Observe that the Cankaya University Webmail page is displayed. |
| Cleanup | Go back to user homepage. |

6.6.27 GUI.A_BTN_WS.01

| | |
|------------------------------|---------------------------------------------------------------------------|
| TC_ID | GUI.A_BTN_WS.01 |
| Purpose | Publish Announcements Page is opened on the website. |
| Requirements | 4.1.1 |
| Priority | High. |
| Estimated Time Needed | 5 Seconds. |
| Dependency | The teacher is logged in to the system. |
| Setup | The user homepage on the website is prepared. |
| Procedure | [A01] Login to the system. |
| | [A02] Click the “Publish Announcements” Button. |
| | [V01] Observe that the Publish Announcements Page is appearing correctly. |
| | |
| Cleanup | Go back to user homepage. |

6.6.28 GUI.T_BTN_WS.01

| | |
|------------------------------|--------------------------------------------------------------------|
| TC_ID | GUI.T_BTN_WS.01 |
| Purpose | Timetable Page is opened on the website. |
| Requirements | 4.1.1 |
| Priority | High. |
| Estimated Time Needed | 5 Seconds. |
| Dependency | The teacher is logged in to the system. |
| Setup | The user homepage on the website is prepared. |
| Procedure | [A01] Login to the system. |
| | [A02] Click the “Edit Timetable” Button. |
| | [V01] Observe that the Edit Timetable Page is appearing correctly. |
| | |
| Cleanup | Go back to user homepage. |

6.6.29 GUI.TP_ADD_BTN_WS.01

| | |
|------------------------------|----------------------------------------------------------------------|
| TC_ID | GUI.TP_ADD_BTN_WS.01 |
| Purpose | A new hour is added to the timetable. |
| Requirements | 4.1.1 |
| Priority | High. |
| Estimated Time Needed | 5 Seconds. |
| Dependency | The teacher is logged in to the system. |
| Setup | The user homepage on the website is prepared. |
| Procedure | [A01] Login to the system. |
| | [A02] Click the “Edit Timetable” Button. |
| | [A03] Select day, hour, content. |
| | [A04] Click the “Add” button. |
| | [V01] Observe that the new hour is added correctly to the timetable. |
| Cleanup | Go back to user homepage. |

6.6.30 GUI.TP_ADD_BTN_WS.02

| | |
|------------------------------|-----------------------------------------------------------------|
| TC_ID | GUI.TP_ADD_BTN_WS.02 |
| Purpose | Day is not chosen and error message is displayed. |
| Requirements | 4.1.1 |
| Priority | High. |
| Estimated Time Needed | 5 Seconds. |
| Dependency | The teacher is logged in to the system. |
| Setup | The user homepage on the website is prepared. |
| Procedure | [A01] Login to the system. |
| | [A02] Click the “Edit Timetable” Button. |
| | [A03] Select hour, content. |
| | [A04] Click the “Add” button. |
| | [V01] Observe that an error message is appearing on the screen. |
| Cleanup | Go back to user homepage. |

6.6.31 GUI.TP_ADD_BTN_WS.03

| | |
|------------------------------|-----------------------------------------------------------------|
| TC_ID | GUI.TP_ADD_BTN_WS.03 |
| Purpose | Hour is not chosen and error message is displayed. |
| Requirements | 4.1.1 |
| Priority | High. |
| Estimated Time Needed | 5 Seconds. |
| Dependency | The teacher is logged in to the system. |
| Setup | The user homepage on the website is prepared. |
| Procedure | [A01] Login to the system. |
| | [A02] Click the “Edit Timetable” Button. |
| | [A03] Select day, content. |
| | [A04] Click the “Add” button. |
| | [V01] Observe that an error message is appearing on the screen. |
| Cleanup | Go back to user homepage. |

6.6.32 GUI.TP_ADD_BTN_WS.04

| | |
|------------------------------|-----------------------------------------------------------------|
| TC_ID | GUI.TP_ADD_BTN_WS.04 |
| Purpose | Content is not chosen and error message is displayed. |
| Requirements | 4.1.1 |
| Priority | High. |
| Estimated Time Needed | 5 Seconds. |
| Dependency | The teacher is logged in to the system. |
| Setup | The user homepage on the website is prepared. |
| Procedure | [A01] Login to the system. |
| | [A02] Click the “Edit Timetable” Button. |
| | [A03] Select day, hour. |
| | [A04] Click the “Add” button. |
| | [V01] Observe that an error message is appearing on the screen. |
| Cleanup | Go back to user homepage. |

6.6.33 GUI.TP_RES_BTN_WS.01

| | |
|------------------------------|-----------------------------------------------------------------------------------------|
| TC_ID | GUI.TP_RES_BTN_WS.01 |
| Purpose | All the added extra hours are deleted from the timetable. |
| Requirements | 4.1.1 |
| Priority | High. |
| Estimated Time Needed | 5 Seconds. |
| Dependency | The teacher is logged in to the system. |
| Setup | The user homepage on the website is prepared. |
| Procedure | [A01] Login to the system. |
| | [A02] Click the “Edit Timetable” Button. |
| | [A03] Click the “Reset” button. |
| | [V01] Observe that all the previously added extra hours are deleted from the timetable. |
| Cleanup | Go back to user homepage. |

6.6.34 GUI.LG_BTN_WS.01

| | |
|------------------------------|----------------------------------------------------------|
| TC_ID | GUI.LG_BTN_WS.01 |
| Purpose | The user is logged out from the system. |
| Requirements | 4.1.1 |
| Priority | Low. |
| Estimated Time Needed | 2 Seconds. |
| Dependency | The teacher is logged in to the system. |
| Setup | The user homepage on the website is prepared. |
| Procedure | [A01] Login to the system. |
| | [A02] Click the “Logout” Button. |
| | [V01] Observe that the Home Page is appearing correctly. |
| Cleanup | - |

6.6.35 GUI_VD_BTN_WS.01

| | |
|------------------------------|-----------------------------------------------------------------------|
| TC_ID | GUI_VD_BTN_WS.01 |
| Purpose | Verify the Device Page is opened on the website. |
| Requirements | 4.1.1 |
| Priority | High. |
| Estimated Time Needed | 5 Seconds. |
| Dependency | The admin is logged in to the system. |
| Setup | The admin homepage on the website is prepared. |
| Procedure | [A01] Login to the system. |
| | [A02] Click the “Verify the Device” Button. |
| | [V01] Observe that the Verify the Device Page is appearing correctly. |
| Cleanup | Go back to admin homepage. |

6.6.36 GUI_VD_V_BTN_WS.01

| | |
|------------------------------|---------------------------------------------------------|
| TC_ID | GUI_VD_V_BTN_WS.01 |
| Purpose | A new device is added to the database. |
| Requirements | 4.1.1 |
| Priority | High. |
| Estimated Time Needed | 5 Seconds. |
| Dependency | The admin is logged in to the system. |
| Setup | The admin homepage on the website is prepared. |
| Procedure | [A01] Login to the system. |
| | [A02] Click the “Verify the Device” Button. |
| | [A03] Enter a code for the device. |
| | [A04] Click the “Verify” button. |
| | [V01] Observe that the device is added to the database. |
| Cleanup | Go back to admin homepage. |

6.6.37 GUI_AT_BTN_WS.01

| | |
|------------------------------|-------------------------------------------------------------------|
| TC_ID | GUI_AT_BTN_WS.01 |
| Purpose | Add a Teacher Page is opened on the website. |
| Requirements | 4.1.1 |
| Priority | High. |
| Estimated Time Needed | 5 Seconds. |
| Dependency | The admin is logged in to the system. |
| Setup | The admin homepage on the website is prepared. |
| Procedure | [A01] Login to the system. |
| | [A02] Click the “Add a Teacher” Button. |
| | [V01] Observe that the Add a Teacher Page is appearing correctly. |
| Cleanup | Go back to admin homepage. |

6.6.38 GUI.AT_M_BTN_WS.01

| | |
|------------------------------|--------------------------------------------------------------------------------|
| TC_ID | GUI. AT_M_BTN_WS.01 |
| Purpose | A teacher and a device is matched. |
| Requirements | 4.1.1 |
| Priority | High. |
| Estimated Time Needed | 5 Seconds. |
| Dependency | The admin is logged in to the system. |
| Setup | The admin homepage on the website is prepared. |
| Procedure | [A01] Login to the system. |
| | [A02] Click the “Add a Teacher” Button. |
| | [A03] Select an available teacher from the dropdown list. |
| | [A04] Select an available device from the dropdown list. |
| | [A05] Click the “Match” button. |
| | [V01] Observe that a new teacher with his/her device is added to the database. |
| Cleanup | Go back to admin homepage. |

6.6.39 GUI.LGN_BTN_MA.01

| | |
|------------------------------|--------------------------------------------------------------------------------------|
| TC_ID | GUI.LGN_BTN_MA.01 |
| Purpose | Email and password textboxes are displayed on the mobile application to the teacher. |
| Requirements | 4.1.2 |
| Priority | High. |
| Estimated Time Needed | 2 Seconds. |
| Dependency | The application has been started. |
| Setup | The login page on the mobile application is prepared. |
| Procedure | [A01] Download the mobile application. |
| | [A02] Open the mobile application. |
| | [A03] Click the “Login” Button. |
| | [V01] Observe that the login page is appearing correctly. |
| Cleanup | Go back to homepage. |

6.6.40 GUI.EM_BTN_MA.01

| | |
|------------------------------|-----------------------------------------------------------|
| TC_ID | GUI.EM_BTN_MA.01 |
| Purpose | Email page is opened on the mobile application. |
| Requirements | 4.1.2 |
| Priority | High. |
| Estimated Time Needed | 2 Seconds. |
| Dependency | The teacher is logged in to the mobile application. |
| Setup | The user homepage on the mobile application is prepared. |
| Procedure | [A01] Login to the mobile application. |
| | [A02] Click the “Check Email” Button. |
| | [V01] Observe that the Email page is appearing correctly. |
| Cleanup | Go back to user homepage. |

6.6.41 GUI.EP_REP_BTN_MA.01

| | |
|------------------------------|------------------------------------------------------------|
| TC_ID | GUI.EP_REP_BTN_MA.01 |
| Purpose | Email page is opened on the mobile application. |
| Requirements | 4.1.2 |
| Priority | High. |
| Estimated Time Needed | 5 Seconds. |
| Dependency | The teacher is logged in to the mobile application. |
| Setup | The user homepage on the mobile application is prepared. |
| Procedure | [A01] Login to the mobile application. |
| | [A02] Click the “Email” Button. |
| | [A03] Enter content, receiver’s email address and subject. |
| | [A04] Click the “Reply” button. |
| | [V01] Observe that the email is sent correctly. |
| Cleanup | Go back to user homepage. |

6.6.42 GUI.A_BTN_MA.01--70

| | |
|------------------------------|-------------------------------------------------------------------|
| TC_ID | GUI.A_BTN_MA.01 |
| Purpose | Announcements page is opened on the mobile application. |
| Requirements | 4.1.2 |
| Priority | High. |
| Estimated Time Needed | 2 Seconds. |
| Dependency | The teacher is logged in to the mobile application. |
| Setup | The user homepage on the mobile application is prepared. |
| Procedure | [A01] Login to the mobile application. |
| | [A02] Click the “Announcements” Button. |
| | [V01] Observe that the Announcements page is appearing correctly. |
| Cleanup | Go back to user homepage. |

6.6.43 GUI.A_PA_BTN_MA.01

| | |
|------------------------------|-----------------------------------------------------------------------------|
| TC_ID | GUI.A_PA_BTN_MA.01 |
| Purpose | Announcements page is opened on the mobile application. |
| Requirements | 4.1.2 |
| Priority | High. |
| Estimated Time Needed | 2 Seconds. |
| Dependency | The teacher is logged in to the mobile application. |
| Setup | The user homepage on the mobile application is prepared. |
| Procedure | [A01] Login to the mobile application. |
| | [A02] Click the “Announcements” Button. |
| | [A03] Click the “Publish an Announcement” button. |
| | [V01] Observe that the Publish an Announcement page is appearing correctly. |
| Cleanup | Go back to user homepage. |

6.6.44 GUI.PA_P_BTN_MA.01

| | |
|------------------------------|---------------------------------------------------------------|
| TC_ID | GUI.PA_BTN_MA.01 |
| Purpose | A new announcement is published. |
| Requirements | 4.1.2 |
| Priority | High. |
| Estimated Time Needed | 3 Seconds. |
| Dependency | The teacher is logged in to the mobile application. |
| Setup | The user homepage on the mobile application is prepared. |
| Procedure | [A01] Login to the mobile application. |
| | [A02] Click the “Announcements” Button. |
| | [A03] Click the “Publish an Announcement” button. |
| | [A04] Enter content and expiry date. |
| | [A05] Click the “Publish” button. |
| | [V01] Observe that a new announcement is published correctly. |
| Cleanup | Go back to user homepage. |

6.6.45 GUI.A_EDT_BTN_MA.01

| | |
|------------------------------|-------------------------------------------------------------------------|
| TC_ID | GUI.A_EDT_BTN_MA.01 |
| Purpose | Edit announcement page is displayed. |
| Requirements | 4.1.2 |
| Priority | High. |
| Estimated Time Needed | 2 Seconds. |
| Dependency | The teacher is logged in to the mobile application. |
| Setup | The user homepage on the mobile application is prepared. |
| Procedure | [A01] Login to the mobile application. |
| | [A02] Click the “Announcements” Button. |
| | [A03] Click the “Edit Announcement” button. |
| | [V01] Observe the edit email page is appearing on the screen correctly. |
| Cleanup | Go back to user homepage. |

6.6.46 GUI.EA_U_BTN_MA.01

| | |
|------------------------------|-----------------------------------------------------------|
| TC_ID | GUI.EA_U_BTN_MA.01 |
| Purpose | A selected announcement is updated. |
| Requirements | 4.1.2 |
| Priority | High. |
| Estimated Time Needed | 3 Seconds. |
| Dependency | The teacher is logged in to the mobile application. |
| Setup | The user homepage on the mobile application is prepared. |
| Procedure | [A01] Login to the mobile application. |
| | [A02] Click the “Announcements” Button. |
| | [A03] Click the “Edit Announcement” button. |
| | [A04] Enter a new content. |
| | [A05] Click the “Update” button. |
| | [V01] Observe that the announcement is updated correctly. |
| Cleanup | Go back to user homepage. |

6.6.47 GUI.EA_DEL_BTN_MA.01

| | |
|------------------------------|-----------------------------------------------------------|
| TC_ID | GUI.EA_DEL_BTN_MA.01 |
| Purpose | A selected announcement is deleted. |
| Requirements | 4.1.2 |
| Priority | High. |
| Estimated Time Needed | 3 Seconds. |
| Dependency | The teacher is logged in to the mobile application. |
| Setup | The user homepage on the mobile application is prepared. |
| Procedure | [A01] Login to the mobile application. |
| | [A02] Click the “Announcements” Button. |
| | [A03] Click the “Edit Announcement” button. |
| | [A04] Select an announcement. |
| | [A05] Click the “Delete” button. |
| | [V01] Observe that the announcement is deleted correctly. |
| Cleanup | Go back to user homepage. |

6.6.48 GUI.T_BTN_MA.01

| | |
|------------------------------|---------------------------------------------------------------|
| TC_ID | GUI.T_BTN_MA.01 |
| Purpose | Timetable page is opened on the mobile application. |
| Requirements | 4.1.2 |
| Priority | High. |
| Estimated Time Needed | 2 Seconds. |
| Dependency | The teacher is logged in to the mobile application. |
| Setup | The user homepage on the mobile application is prepared. |
| Procedure | [A01] Login to the system. |
| | [A02] Click the “Timetable” Button. |
| | [V01] Observe that the Timetable page is appearing correctly. |
| Cleanup | Go back to user homepage. |

6.6.49 GUI.TP_T_BTN_MA.01

| | |
|------------------------------|----------------------------------------------------------------------------------|
| TC_ID | GUI.TP_T_BTN_MA.01 |
| Purpose | Timetable page is opened on the mobile application. |
| Requirements | 4.1.2 |
| Priority | High. |
| Estimated Time Needed | 2 Seconds. |
| Dependency | The teacher is logged in to the mobile application. |
| Setup | The user homepage on the mobile application is prepared. |
| Procedure | [A01] Login to the system. |
| | [A02] Click the “Timetable” Button. |
| | [A03] Click the “Tuesday” Button. |
| | [V01] Observe that the Tuesday’s timetable is appearing correctly on the screen. |
| Cleanup | Go back to user homepage. |

6.6.50 GUI.TP_W_BTN_MA.01

| | |
|------------------------------|------------------------------------------------------------------------------------|
| TC_ID | GUI.TP_W_BTN_MA.01 |
| Purpose | Timetable page is opened on the mobile application. |
| Requirements | 4.1.2 |
| Priority | High. |
| Estimated Time Needed | 3 Seconds. |
| Dependency | The teacher is logged in to the mobile application. |
| Setup | The user homepage on the mobile application is prepared. |
| Procedure | [A01] Login to the system. |
| | [A02] Click the “Timetable” Button. |
| | [A03] Click the “Wednesday” Button. |
| | [V01] Observe that the Wednesday’s timetable is appearing correctly on the screen. |
| Cleanup | Go back to user homepage. |

6.6.51 GUI.TP_TH_BTN_MA.01

| | |
|------------------------------|-----------------------------------------------------------------------------------|
| TC_ID | GUI.TP_TH_BTN_MA.01 |
| Purpose | Timetable page is opened on the mobile application. |
| Requirements | 4.1.2 |
| Priority | High. |
| Estimated Time Needed | 3 Seconds. |
| Dependency | The teacher is logged in to the mobile application. |
| Setup | The user homepage on the mobile application is prepared. |
| Procedure | [A01] Login to the system. |
| | [A02] Click the “Timetable” Button. |
| | [A03] Click the “Thursday” Button. |
| | [V01] Observe that the Thursday’s timetable is appearing correctly on the screen. |
| Cleanup | Go back to user homepage. |

6.6.52 GUI.TP_F_BTN_MA.01

| | |
|------------------------------|---------------------------------------------------------------------------------|
| TC_ID | GUI.TP_F_BTN_MA.01 |
| Purpose | Timetable page is opened on the mobile application. |
| Requirements | 4.1.2 |
| Priority | High. |
| Estimated Time Needed | 3 Seconds. |
| Dependency | The teacher is logged in to the mobile application. |
| Setup | The user homepage on the mobile application is prepared. |
| Procedure | [A01] Login to the system. |
| | [A02] Click the “Timetable” Button. |
| | [A03] Click the “Friday” Button. |
| | [V01] Observe that the Friday’s timetable is appearing correctly on the screen. |
| Cleanup | Go back to user homepage. |

6.6.53 GUI.TP_ADD_BTN_MA.01

| | |
|------------------------------|----------------------------------------------------------------------|
| TC_ID | GUI.TP_ADD_BTN_MA.01 |
| Purpose | Timetable page is opened on the mobile application. |
| Requirements | 4.1.2 |
| Priority | High. |
| Estimated Time Needed | 5 Seconds. |
| Dependency | The teacher is logged in to the mobile application. |
| Setup | The user homepage on the mobile application is prepared. |
| Procedure | [A01] Login to the system. |
| | [A02] Click the “Timetable” Button. |
| | [A03] Select day, hour, content. |
| | [A04] Click the “Add” button. |
| | [V01] Observe that the new hour is added correctly to the timetable. |
| Cleanup | Go back to user homepage. |

6.6.54 GUI.TP_ADD_BTN_MA.02

| | |
|------------------------------|-----------------------------------------------------------------|
| TC_ID | GUI.TP_ADD_BTN_MA.02 |
| Purpose | Day is not chosen and error message is displayed. |
| Requirements | 4.1.2 |
| Priority | High. |
| Estimated Time Needed | 5 Seconds. |
| Dependency | The teacher is logged in to the mobile application. |
| Setup | The user homepage on the mobile application is prepared. |
| Procedure | [A01] Login to the system. |
| | [A02] Click the “Timetable” Button. |
| | [A03] Select hour, content. |
| | [A04] Click the “Add” button. |
| | [V01] Observe that an error message is appearing on the screen. |
| Cleanup | Go back to user homepage. |

6.6.55 GUI.TP_ADD_BTN_MA.03

| | |
|------------------------------|-----------------------------------------------------------------|
| TC_ID | GUI.TP_ADD_BTN_MA.03 |
| Purpose | Hour is not chosen, and error message is displayed. |
| Requirements | 4.1.2 |
| Priority | High. |
| Estimated Time Needed | 5 Seconds. |
| Dependency | The teacher is logged in to the mobile application. |
| Setup | The user homepage on the mobile application is prepared. |
| Procedure | [A01] Login to the system. |
| | [A02] Click the “Timetable” Button. |
| | [A03] Select day, content. |
| | [A04] Click the “Add” button. |
| | [V01] Observe that an error message is appearing on the screen. |
| Cleanup | Go back to user homepage. |

6.6.56 GUI.TP_ADD_BTN_MA.04

| | |
|------------------------------|-----------------------------------------------------------------|
| TC_ID | GUI.TP_ADD_BTN_MA.04 |
| Purpose | Content is not chosen and error message is displayed. |
| Requirements | 4.1.2 |
| Priority | High. |
| Estimated Time Needed | 5 Seconds. |
| Dependency | The teacher is logged in to the mobile application. |
| Setup | The user homepage on the mobile application is prepared. |
| Procedure | [A01] Login to the system. |
| | [A02] Click the “Timetable” Button. |
| | [A03] Select day, hour. |
| | [A04] Click the “Add” button. |
| | [V01] Observe that an error message is appearing on the screen. |
| Cleanup | Go back to user homepage. |

6.6.57 GUI.LG_BTN_MA.01

| | |
|------------------------------|----------------------------------------------------------|
| TC_ID | GUI.LG_BTN_MA.01 |
| Purpose | Logout interface is opened on the mobile application. |
| Requirements | 4.1.2 |
| Priority | Low. |
| Estimated Time Needed | 2 Seconds. |
| Dependency | The teacher is logged in to the system. |
| Setup | The user homepage on the mobile application is prepared. |
| Procedure | [A01] Login to the system. |
| | [A02] Click the “Logout” Button. |
| | [V01] Observe that the Home Page is appearing correctly. |
| Cleanup | - |

6.6.58 MA.LGN.01

| | |
|------------------------------|--------------------------------------------------------------|
| TC_ID | MA.LGN.01 |
| Purpose | Enter valid email address and password. |
| Requirements | 4.1.2 |
| Priority | Low. |
| Estimated Time Needed | 5 Seconds. |
| Dependency | Login button is clicked. |
| Setup | The Login interface is prepared. |
| Procedure | [A01] Enter an email address. |
| | [A02] Enter a password. |
| | [A03] Click the Login Button. |
| | [V01] Observe that the user homepage is appearing correctly. |
| Cleanup | Go back to homepage. |

6.6.59 MA.LGN.02

| | |
|------------------------------|------------------------------------------------------------|
| TC_ID | MA.LGN.02 |
| Purpose | Enter valid password and invalid email address. |
| Requirements | 4.1.2 |
| Priority | Low. |
| Estimated Time Needed | 5 Seconds. |
| Dependency | Login button is clicked. |
| Setup | The Login interface is prepared. |
| Procedure | [A01] Enter an email address. |
| | [A02] Enter a password. |
| | [A03] Click the Login Button. |
| | [V01] Observe that the warning message has been displayed. |
| Cleanup | Go back to homepage. |

6.6.60 MA.LGN.03

| | |
|------------------------------|------------------------------------------------------------|
| TC_ID | MA.LGN.03 |
| Purpose | Enter invalid password and valid email address. |
| Requirements | 4.1.2 |
| Priority | Low. |
| Estimated Time Needed | 5 Seconds. |
| Dependency | Login button is clicked. |
| Setup | The Login interface is prepared. |
| Procedure | [A01] Enter an email address. |
| | [A02] Enter a password. |
| | [A03] Click the Login Button. |
| | [V01] Observe that the warning message has been displayed. |
| Cleanup | Go back to homepage. |

6.6.61 MA.LGN.04

| | |
|------------------------------|------------------------------------------------------------|
| TC_ID | MA.LGN.04 |
| Purpose | Enter invalid password and invalid email address. |
| Requirements | 4.1.2 |
| Priority | Low. |
| Estimated Time Needed | 5 Seconds. |
| Dependency | Login button is clicked. |
| Setup | The Login interface is prepared. |
| Procedure | [A01] Enter an email address. |
| | [A02] Enter a password. |
| | [A03] Click the Login Button. |
| | [V01] Observe that the warning message has been displayed. |
| Cleanup | Go back to homepage. |

6.6.62 MA.EM.01

| | |
|------------------------------|------------------------------------------------------------------------------------|
| TC_ID | MA.EM.01 |
| Purpose | All emails are displayed with the time sent, name of the sender and their content. |
| Requirements | 4.1.2 |
| Priority | High. |
| Estimated Time Needed | 10 Seconds. |
| Dependency | The teacher is logged in to the mobile application. |
| Setup | The Email interface is prepared. |
| Procedure | [A01] Click the “Check Email” button on the user homepage. |
| | [V01] Observe that the all emails are appearing correctly. |
| Cleanup | Go back to user homepage. |

6.6.63 MA.AN.01

| | |
|------------------------------|---------------------------------------------------------------------|
| TC_ID | MA.AN.01 |
| Purpose | All the published announcements with their dates are displayed. |
| Requirements | 4.1.2 |
| Priority | Medium. |
| Estimated Time Needed | 10 Seconds. |
| Dependency | The teacher is logged in to the mobile application. |
| Setup | The Publish Announcement interface is prepared. |
| Procedure | [A01] Click the “Publish Announcement” button on the user homepage. |
| | [A02] Click the “All Announcements” button. |
| | [V01] Observe that the all announcements are appearing correctly. |
| Cleanup | Go back to user homepage. |

6.6.64 MA.AN.02

| | |
|------------------------------|-----------------------------------------------------------------------|
| TC_ID | MA.AN.02 |
| Purpose | By using the textbox and the button, a new announcement is published. |
| Requirements | 4.1.2 |
| Priority | Medium. |
| Estimated Time Needed | 10 Seconds. |
| Dependency | The teacher is logged in to the mobile application. |
| Setup | The Announcement interface is prepared. |
| Procedure | [A01] Click the “Publish Announcement” button on the user homepage. |
| | [A02] Click the “Publish a New Announcement” button. |
| | [V01] Observe that the all announcements are appearing correctly. |
| Cleanup | Go back to user homepage. |

6.6.65 MA.TT.01

| | |
|------------------------------|--------------------------------------------------------------------|
| TC_ID | MA.TT.01 |
| Purpose | Teacher's timetable with lectures and times are displayed. |
| Requirements | 4.1.2 |
| Priority | High. |
| Estimated Time Needed | 10 Seconds. |
| Dependency | The teacher is logged in to the mobile application. |
| Setup | The Timetable interface is prepared. |
| Procedure | [A01] Click the "Edit Timetable" button on the user homepage. |
| | [V01] Observe that the teacher's timetable is appearing correctly. |
| Cleanup | Go back to user homepage. |

6.6.66 MA.TT.02

| | |
|------------------------------|---------------------------------------------------------------------------|
| TC_ID | MA.TT.02 |
| Purpose | By clicking on a box in the timetable, the teacher's timetable is edited. |
| Requirements | 4.1.2 |
| Priority | Medium. |
| Estimated Time Needed | 10 Seconds. |
| Dependency | The teacher is logged in to the mobile application. |
| Setup | The Timetable interface is prepared. |
| Procedure | [A01] Click the "Edit Timetable" button on the user homepage. |
| | [A02] Click on any lecture hour. |
| | [A03] Add or delete anything. |
| | [V01] Observe that the teacher's new timetable is appearing correctly. |
| Cleanup | Go back to user homepage. |

6.6.67 WS.LGN.01

| | |
|------------------------------|--------------------------------------------------------------|
| TC_ID | WS.LGN.01 |
| Purpose | Enter valid email address and password. |
| Requirements | 4.1.1 |
| Priority | Low. |
| Estimated Time Needed | 5 Seconds. |
| Dependency | Login button is clicked. |
| Setup | The Login Page is prepared. |
| Procedure | [A01] Enter an email address. |
| | [A02] Enter a password. |
| | [A03] Click the Login Button. |
| | [V01] Observe that the user homepage is appearing correctly. |
| Cleanup | Go back to homepage. |

6.6.68 WS.LGN.02

| | |
|------------------------------|------------------------------------------------------------|
| TC_ID | WS.LGN.02 |
| Purpose | Enter valid password and invalid email address. |
| Requirements | 4.1.1 |
| Priority | Low. |
| Estimated Time Needed | 5 Seconds. |
| Dependency | Login button is clicked. |
| Setup | The Login Page is prepared. |
| Procedure | [A01] Enter an email address. |
| | [A02] Enter a password. |
| | [A03] Click the Login Button. |
| | [V01] Observe that the warning message has been displayed. |
| Cleanup | Go back to homepage. |

6.6.69 WS.LGN.03

| | |
|------------------------------|------------------------------------------------------------|
| TC_ID | WS.LGN.03 |
| Purpose | Enter invalid password and valid email address. |
| Requirements | 4.1.1 |
| Priority | Low. |
| Estimated Time Needed | 5 Seconds. |
| Dependency | Login button is clicked. |
| Setup | The Login Page is prepared. |
| Procedure | [A01] Enter an email address. |
| | [A02] Enter a password. |
| | [A03] Click the Login Button. |
| | [V01] Observe that the warning message has been displayed. |
| Cleanup | Go back to homepage. |

6.6.70 WS.LGN.04

| | |
|------------------------------|------------------------------------------------------------|
| TC_ID | WS.LGN.04 |
| Purpose | Enter invalid password and invalid email address. |
| Requirements | 4.1.1 |
| Priority | Low. |
| Estimated Time Needed | 5 Seconds. |
| Dependency | Login button is clicked. |
| Setup | The Login Page is prepared. |
| Procedure | [A01] Enter an email address. |
| | [A02] Enter a password. |
| | [A03] Click the Login Button. |
| | [V01] Observe that the warning message has been displayed. |
| Cleanup | Go back to homepage. |

6.6.71 WS.EM.01

| | |
|------------------------------|------------------------------------------------------------------------------------|
| TC_ID | WS.EM.01 |
| Purpose | All emails are displayed with the time sent, name of the sender and their content. |
| Requirements | 4.1.1 |
| Priority | High. |
| Estimated Time Needed | 10 Seconds. |
| Dependency | The teacher is logged in to the website. |
| Setup | The Email Page is prepared. |
| Procedure | [A01] Click the “Check Email” button on the user homepage. |
| | [V01] Observe that the all emails are appearing correctly. |
| Cleanup | Go back to user homepage. |

6.6.72 WS.AN.01

| | |
|------------------------------|---------------------------------------------------------------------|
| TC_ID | WS.AN.01 |
| Purpose | All the published announcements with their dates are displayed. |
| Requirements | 4.1.1 |
| Priority | Medium. |
| Estimated Time Needed | 10 Seconds. |
| Dependency | The teacher is logged in to the website. |
| Setup | The Publish Announcement Page is prepared. |
| Procedure | [A01] Click the “Publish Announcement” button on the user homepage. |
| | [A02] Click the “All Announcements” button. |
| | [V01] Observe that the all announcements are appearing correctly. |
| Cleanup | Go back to user homepage. |

6.6.73 WS.AN.02

| | |
|------------------------------|-----------------------------------------------------------------------|
| TC_ID | WS.AN.02 |
| Purpose | By using the textbox and the button, a new announcement is published. |
| Requirements | 4.1.1 |
| Priority | High. |
| Estimated Time Needed | 10 Seconds. |
| Dependency | The teacher is logged in to the website |
| Setup | The Announcement Page is prepared. |
| Procedure | [A01] Click the “Publish Announcement” button on the user homepage. |
| | [A02] Click the “Publish a New Announcement” button. |
| | [V01] Observe that the all announcements are appearing correctly. |
| Cleanup | Go back to user homepage. |

6.6.74 WS.TT.01

| | |
|------------------------------|--------------------------------------------------------------------|
| TC_ID | WS.TT.01 |
| Purpose | Teacher's timetable with lectures and times are displayed. |
| Requirements | 4.1.1 |
| Priority | High. |
| Estimated Time Needed | 10 Seconds. |
| Dependency | The teacher is logged in to the website. |
| Setup | The Timetable Page is prepared. |
| Procedure | [A01] Click the "Edit Timetable" button on the user homepage. |
| | [V01] Observe that the teacher's timetable is appearing correctly. |
| Cleanup | Go back to user homepage. |

6.6.75 WS.TT.02

| | |
|------------------------------|---------------------------------------------------------------------------|
| TC_ID | WS.TT.02 |
| Purpose | By clicking on a box in the timetable, the teacher's timetable is edited. |
| Requirements | 4.1.1 |
| Priority | Medium. |
| Estimated Time Needed | 10 Seconds. |
| Dependency | The teacher is logged in to the website. |
| Setup | The Timetable Page is prepared. |
| Procedure | [A01] Click the "Edit Timetable" button on the user homepage. |
| | [A02] Click on any lecture hour. |
| | [A03] Add or delete anything. |
| | [V01] Observe that the teacher's new timetable is appearing correctly. |
| Cleanup | Go back to user homepage. |

6.6.76 WS.AT.01

| | |
|------------------------------|----------------------------------------------------------------|
| TC_ID | WS.AT.01 |
| Purpose | A teacher is added to the database. |
| Requirements | 4.1.1 |
| Priority | Low. |
| Estimated Time Needed | 10 Seconds. |
| Dependency | The admin is logged in to the website. |
| Setup | The Adding Page is prepared. |
| Procedure | [A01] Click "Add a Teacher" button. |
| | [A02] Select the teacher name in drop-down list. |
| | [A03] Select a free device in drop-down list. |
| | [A04] Click the Match button. |
| | [V01] Observe that the warning message is appearing correctly. |
| Cleanup | Go back to user homepage. |

6.6.77 WS.VD.01

| | |
|------------------------------|----------------------------------------------------------------|
| TC_ID | WS.VD.01 |
| Purpose | A newly registered device is verified. |
| Requirements | 4.1.1 |
| Priority | Low. |
| Estimated Time Needed | 10 Seconds. |
| Dependency | The admin is logged in to the website. |
| Setup | The Verify the Device Page is prepared. |
| Procedure | [A01] Click “Verify the Device” button. |
| | [A02] Enter the device ID. |
| | [V01] Observe that the warning message is appearing correctly. |
| Cleanup | Go back to user homepage. |

6.6.78 CNC.DB.01

| | |
|------------------------------|---------------------------------------------------------------------------|
| TC_ID | CNC.DB.01 |
| Purpose | Connection is enabled. |
| Requirements | 4.1.3 |
| Priority | High. |
| Estimated Time Needed | 10 Seconds. |
| Dependency | - |
| Setup | The data is prepared. |
| Procedure | [A01] Start the system. |
| | [V01] Observe that the “Connection is established.” message is appearing. |
| Cleanup | - |

6.6.79 CNC.WSVR.01

| | |
|------------------------------|---------------------------------------------------------------------------|
| TC_ID | CNC.WSVR.01 |
| Purpose | Conneciton is enabled. |
| Requirements | 4.1.3 |
| Priority | High. |
| Estimated Time Needed | 5 Seconds. |
| Dependency | The Raspberry Pi is running. |
| Setup | - |
| Procedure | [A01] Start the system. |
| | [V01] Observe that the “Connection is established.” message is appearing. |
| Cleanup | - |

6.6.80 EQ.MS.01

| | |
|------------------------------|---------------------------------------------------------------|
| TC_ID | EQ.MS.01 |
| Purpose | There is no one in front of the device, the screen is closed. |
| Requirements | 4.1.3 |
| Priority | Medium. |
| Estimated Time Needed | - |
| Dependency | Device is running. |
| Setup | Motion sensor is implemented. |
| Procedure | [A01] Stay out of the range of the sensor. |
| | [V01] Observe that the screen is closed. |
| Cleanup | - |

6.6.81 EQ.MS.02

| | |
|------------------------------|----------------------------------------------------------------|
| TC_ID | EQ.MS.03 |
| Purpose | There is someone in front of the device, the screen is opened. |
| Requirements | 4.1.3 |
| Priority | Medium. |
| Estimated Time Needed | - |
| Dependency | Device is running. |
| Setup | Motion sensor is implemented. |
| Procedure | [A01] Stay inside of the range of the sensor. |
| | [V01] Observe that the screen is opened. |
| Cleanup | - |

6.6.82 EQ.CMR.01

| | |
|------------------------------|---------------------------------------------|
| TC_ID | EQ.CMR.01 |
| Purpose | The photograph is taken. |
| Requirements | 4.1.3 |
| Priority | Low. |
| Estimated Time Needed | 3 Seconds. |
| Dependency | An Email Message template is choosen. |
| Setup | The camera is implemented. |
| Procedure | [A01] Click the right arrow button. |
| | [A02] Enter the email address. |
| | [A03] Choose an email message template. |
| | [V01] Observe that the photograph is taken. |
| Cleanup | Go back to main page. |

7. Test Result

7.1 Individual Test Result

| TC_ID | Priority | Date Run | Run By | Result | Explanation |
|----------------------|----------|------------|------------------|--------|--------------------------------------------------------------------------------------|
| GUI.R_BTN.01 | L | 20.05.2018 | Utku Kılavuz | Pass | Page is changed correctly. |
| GUI.L_BTN.01 | L | 20.05.2018 | Utku Kılavuz | Pass | Page is changed correctly. |
| GUI.TP_TS.01 | H | 20.05.2018 | Timur Atila | Pass | Timetable is being displayed. |
| GUI.EP_TS.01 | H | 20.05.2018 | Hatice Nazlı Kuş | Pass | All message templates, email address textbox and numpad are displayed on the screen. |
| GUI.EP_TS.02 | M | 20.05.2018 | Özlem Kılıç | Pass | “Email is valid” message is displayed. |
| GUI.EP_TS.03 | M | 20.05.2018 | Hatice Nazlı Kuş | Pass | “Email is invalid” error message is displayed. |
| GUI.EP_NP_TS.01 | H | 20.05.2018 | Utku Kılavuz | Pass | Clicked numbers are appearing on the textbox. |
| GUI.EP_NP_DB_TS.01 | M | 20.05.2018 | Timur Atila | Pass | Last number entered is deleted from the textbox. |
| GUI.EP_NP_RB_TS.01 | M | 20.05.2018 | Timur Atila | Pass | All the numbers entered are deleted from the textbox. |
| GUI.EP_TB_TS.01 | M | 20.05.2018 | Özlem Kılıç | Pass | Camera message is appearing. |
| GUI.AP_TS.01 | H | 20.05.2018 | Özlem Kılıç | Pass | All announcements and their date are displayed on the screen. |
| GUI.LGN_BTN_WS.01 | H | 20.05.2018 | Hatice Nazlı Kuş | Pass | Email and password textboxes are displayed. |
| GUI.EM_BTN_WS.01 | H | 20.05.2018 | Utku Kılavuz | Pass | Emails Page is appearing correctly. |
| GUI.EM_INB_BTN_WS.01 | H | 20.05.2018 | Özlem Kılıç | Pass | Inbox Page is appearing correctly. |
| GUI.IP_SLC_BTN_WS.01 | M | 20.05.2018 | Özlem Kılıç | Pass | Reply and Exit buttons are displayed. |
| GUI.IP_REP_BTN_WS.01 | M | 20.05.2018 | Timur Atila | Pass | Receiver, subject and content textboxes with |

| | | | | | |
|-----------------------|---|------------|------------------|------|----------------------------------------------------------|
| | | | | | send button is appearing correctly. |
| GUI.IP_SND_BTN_WS.01 | M | 20.05.2018 | Utku Kılavuz | Pass | E-mail is sent. |
| GUI.IP_SND_BTN_WS.02 | M | 20.05.2018 | Utku Kılavuz | Pass | Error message is displayed. |
| GUI.IP_SND_BTN_WS.03 | M | 20.05.2018 | Utku Kılavuz | Pass | Error message is displayed. |
| GUI.IP_EXT_BTN_WS.01 | L | 20.05.2018 | Hatice Nazlı Kuş | Pass | Select button is reappearing on the gridview. |
| GUI.IP_DEL_BTN_WS.01 | M | 20.05.2018 | Hatice Nazlı Kuş | Pass | Selected email(s) are moved to the trash. |
| GUI.EM_SM_BTN_WS.01 | H | 20.05.2018 | Timur Atila | Pass | Sent mail page with previously sent emails is displayed. |
| GUI.SM_DEL_BTN_WS.01 | M | 20.05.2018 | Özlem Kılıç | Pass | Selected email(s) are moved to the trash. |
| GUI.EM_TRS_BTN_WS.01 | H | 20.05.2018 | Hatice Nazlı Kuş | Pass | Trash page with deleted emails is displayed. |
| GUI.TRS_DEL_BTN_WS.01 | L | 20.05.2018 | Timur Atila | Pass | Selected email(s) are permanently deleted. |
| GUI.EM_WBM_BTN_WS.01 | L | 20.05.2018 | Timur Atila | Pass | The Çankaya University Webmail page is displayed. |
| GUI.A_BTN_WS.01 | H | 20.05.2018 | Hatice Nazlı Kuş | Pass | The Publish Announcements Page is appearing correctly. |
| GUI.T_BTN_WS.01 | H | 20.05.2018 | Utku Kılavuz | Pass | The Edit Timetable Page is appearing correctly. |
| GUI.TP_ADD_BTN_WS.01 | H | 20.05.2018 | Hatice Nazlı Kuş | Pass | The new hour is added correctly to the timetable. |
| GUI.TP_ADD_BTN_WS.02 | H | 20.05.2018 | Özlem Kılıç | Pass | An error message is appearing on the screen. |
| GUI.TP_ADD_BTN_WS.03 | H | 20.05.2018 | Özlem Kılıç | Pass | An error message is appearing on the screen. |
| GUI.TP_ADD_BTN_WS.04 | H | 20.05.2018 | Timur Atila | Pass | An error message is appearing on the screen. |
| GUI.TP_RES_BTN_WS.01 | H | 20.05.2018 | Hatice Nazlı | Pass | All the previously added |

| | | | | | |
|-----------------------|---|------------|------------------|------|---------------------------------------------------------------|
| | | | Kuş | | extra hours are deleted from the timetable. |
| GUI. LG_BTN_WS.01 | L | 20.05.2018 | Özlem Kılıç | Pass | The Home Page is appearing correctly. |
| GUI. VD_BTN_WS.01 | H | 20.05.2018 | Utku Kılavuz | Pass | The Verify the Device Page is appearing correctly. |
| GUI. VD_V_BTN_WS.01 | H | 20.05.2018 | Timur Atila | Pass | The device is added to the database. |
| GUI. AT_BTN_WS.01 | H | 20.05.2018 | Özlem Kılıç | Pass | The Add a Teacher Page is appearing correctly. |
| GUI. AT_M_BTN_WS.01 | H | 20.05.2018 | Hatice Nazlı Kuş | Pass | A new teacher with his/her device is added to the database. |
| GUI. LGN_BTN_MA.01 | H | 20.05.2018 | Timur Atila | Pass | The Login page is appearing correctly. |
| GUI. EM_BTN_MA.01 | H | 20.05.2018 | Hatice Nazlı Kuş | Pass | The Email page is appearing correctly. |
| GUI. EP_REP_BTN_MA.01 | H | 20.05.2018 | Timur Atila | Pass | The email is sent correctly. |
| GUI. A_BTN_MA.01 | H | 20.05.2018 | Utku Kılavuz | Pass | The Announcements page is appearing correctly. |
| GUI.A_PA_BTN_MA.01 | H | 20.05.2018 | Hatice Nazlı Kuş | Pass | The Publish an Announcement page is appearing correctly. |
| GUI. PA_P_BTN_MA.01 | H | 20.05.2018 | Timur Atila | Pass | A new announcement is published correctly. |
| GUI.A_EDT_BTN_MA.01 | H | 20.05.2018 | Özlem Kılıç | Pass | The edit email page is appearing on the screen correctly. |
| GUI.EA_U_BTN_MA.01 | H | 20.05.2018 | Hatice Nazlı Kuş | Pass | The announcement is updated correctly. |
| GUI.EA_DEL_BTN_MA.01 | H | 20.05.2018 | Özlem Kılıç | Pass | The announcement is deleted correctly. |
| GUI. T_BTN_MA.01 | H | 20.05.2018 | Utku Kılavuz | Pass | The Timetable page is appearing correctly. |
| GUI. TP_T_BTN_MA.01 | H | 20.05.2018 | Utku Kılavuz | Pass | The Tuesday's timetable is appearing correctly on the screen. |
| GUI. TP_W_BTN_MA.01 | H | 20.05.2018 | Timur Atila | Pass | The Wednesday's timetable is appearing |

| | | | | | |
|----------------------|---|------------|------------------|------|----------------------------------------------------------------|
| | | | | | correctly on the screen. |
| GUI.TP_TH_BTN_MA.01 | H | 20.05.2018 | Özlem Kılıç | Pass | The Thursday's timetable is appearing correctly on the screen. |
| GUI.TP_F_BTN_MA.01 | H | 20.05.2018 | Utku Kılavuz | Pass | The Friday's timetable is appearing correctly on the screen. |
| GUI.TP_ADD_BTN_MA.01 | H | 20.05.2018 | Utku Kılavuz | Pass | The new hour is added correctly to the timetable. |
| GUI.TP_ADD_BTN_MA.02 | H | 20.05.2018 | Timur Atila | Pass | An error message is appearing on the screen. |
| GUI.TP_ADD_BTN_MA.03 | H | 20.05.2018 | Hatice Nazlı Kuş | Pass | An error message is appearing on the screen. |
| GUI.TP_ADD_BTN_MA.04 | H | 20.05.2018 | Utku Kılavuz | Fail | Extra hour cannot be added. |
| GUI.LG_BTN_MA.01 | L | 20.05.2018 | Özlem Kılıç | Pass | Teacher has been logged out. |
| MA.LGN.01 | L | 20.05.2018 | Timur Atila | Pass | Teacher has been logged in to the system. |
| MA.LGN.02 | L | 20.05.2018 | Hatice Nazlı Kuş | Pass | Error message is displayed. |
| MA.LGN.03 | L | 20.05.2018 | Özlem Kılıç | Pass | Error message is displayed. |
| MA.LGN.04 | L | 20.05.2018 | Hatice Nazlı Kuş | Pass | Error message is displayed. |
| MA.EM.01 | L | 20.05.2018 | Timur Atila | Fail | Emails are not displayed on the screen. |
| MA.AN.01 | M | 20.05.2018 | Utku Kılavuz | Fail | Published announcements are not displayed on the screen. |
| MA.AN.02 | M | 20.05.2018 | Özlem Kılıç | Fail | The new announcement is not published. |
| MA.TT.01 | H | 20.05.2018 | Utku Kılavuz | Fail | Teacher's timetable is not appeared. |
| MA.TT.02 | M | 20.05.2018 | Hatice Nazlı Kuş | Fail | Teacher's new timetable is not appeared. |
| WS.LGN.01 | L | 20.05.2018 | Timur Atila | Pass | Teacher's homepage is opened. |

| | | | | | |
|-------------|---|------------|------------------|------|---------------------------------------------------------|
| WS.LGN.02 | L | 20.05.2018 | Timur Atila | Pass | Error message is displayed. |
| WS.LGN.03 | L | 20.05.2018 | Utku Kılavuz | Pass | Error message is displayed. |
| WS.LGN.04 | L | 20.05.2018 | Özlem Kılıç | Pass | Error message is displayed. |
| WS.EM.01 | H | 20.05.2018 | Hatice Nazlı Kuş | Pass | Teacher's emails are displayed on the screen. |
| WS.AN.01 | M | 20.05.2018 | Timur Atila | Pass | All announcements are displayed on the screen. |
| WS.AN.02 | H | 20.05.2018 | Özlem Kılıç | Pass | New announcement is displayed with other announcements. |
| WS.TT.01 | H | 20.05.2018 | Hatice Nazlı Kuş | Pass | Teacher's timetable is appeared. |
| WS.TT.02 | M | 20.05.2018 | Utku Kılavuz | Pass | Teacher's new timetable is appeared. |
| WS.AT.01 | L | 20.05.2018 | Timur Atila | Pass | Error message is displayed. |
| WS.VD.01 | L | 20.05.2018 | Özlem Kılıç | Pass | Error message is displayed. |
| CNC.DB.01 | H | 20.05.2018 | Utku Kılavuz | Pass | "Connection is established." message is appeared. |
| CNC.WSVR.01 | H | 20.05.2018 | Hatice Nazlı Kuş | Pass | "Connection is established." message is appeared. |
| EQ.MS.01 | M | 20.05.2018 | Utku Kılavuz | Pass | The screen is closed. |
| EQ.MS.03 | M | 20.05.2018 | Özlem Kılıç | Pass | The screen is opened. |
| EQ.CMR.01 | L | 20.05.2018 | Hatice Nazlı Kuş | Pass | The photograph is taken. |

7.2 Summary of Test Result

| Priority | Number of TCs | Executed | Passed |
|--------------|---------------|-----------|-----------|
| H | 44 | 44 | 42 |
| M | 19 | 19 | 16 |
| L | 19 | 19 | 18 |
| Total | 82 | 82 | 76 |

We have executed 82 test cases and 76 test cases are passed. Exit criteria is met.

7.3 Exit Criteria

| Criteria | Met or Not |
|-----------------------------------------------------------------------------------------|------------|
| 100% of the test cases are executed | M |
| 90% of the test cases passed | M |
| 90% of High and Medium Priority test cases passed | M |
| No high priority or severe bugs are left outstanding. | M |
| Verify if software development activities are completed within the projected cost. | M |
| Verify if software development activities are completed within the projected timelines. | M |

7.4 Known Problems

The database connection could not be established for the mobile application. Because of that reason, those test cases are failed. The problem will be solved when the connection is established.

7.5 Conclusion

This section includes the test results of the project “Adroit System for Online Time Table and Announcements”. The test cases are implemented and 93% of the test cases are completed successfully. Software development activities are completed within the anticipated cost. Current stage of the project is available to use except for the mobile application. Failed test cases will be solved in time to increase the quality and usability.

8. Installation and Compilation Guide

In this guide we describe how to install and compile the Adroit System for Online Time Table and Announcement project.

8.1 Prerequisites

- Visual Studio 2015 or above should be installed to compile and run our website.
- Microsoft .NET Framework version 4.7.02556 or above should be installed.
- Android Studio version 3.1.2 or above should be installed to compile and run our mobile application, older versions of Android Studio can cause undesired warnings or errors.
- For compiling our Python code use Idle for compilation. Make sure that the Python version is 3.5.2 otherwise, there can be some errors in compilation stage.
- Our Python code uses some extra libraries. The list you should download your device;
 - Mysql connector for Python
 - Pi camera for Python
 - Image for Python

All of these libraries are required, if they are not installed then you get some compilation errors.

Important: Make note that Python code will only work in Raspberry Pi 3. You can never use the Python code from other devices, otherwise you will get some compilation errors, that they are insoluble.

8.2 Compiling and Running

8.2.1 Compiling and Running for Website

- Copy the source files to master folder of projects of Visual Studio.
- Open Visual Studio → Open the project folders → Open website project file(Default name; AdroitTimetableMysql) → Select 'AdroitTimetableMysql.sln' → Compile the Website project.

There are two ways to running the Website;

- Running the project on Visual Studio
- Running the project on our Host from here. (This state is not required to compiling the project)

8.2.2 Compiling and Running for Mobile Application

- Copy the source files to master folder of projects of Android Studio.
- Open Android Studio → Open the project folders → Open mobile application file(Default name; MobileAppCankaya) → Select the folder → Compile the Mobile Application project.
- **Note:** Android Studio will ask to chance to dictionary for prepare project, please accept it, so Android Studio project run from your device properly.

There are two way to running the Mobile Application;

- Running the project from Android Studio
- Open MobileAppCankaya on Android Studio → ‘Ctrl+Shift+A’ search Edit Configurations and select → Choose the project as Gradle project → In Tasks type assemble → Press OK. Then the project .apk will be in the master folder of projects of Android Studio. Open project folder → Open ‘app’ folder → Open ‘build’ folder → Open ‘outputs’ folder Copy the ‘apk’ folder, open your phone dictionary → Open ‘Android’ folder → Open ‘data’ folder → Crate a folder named ‘com.webcankaya.mobileappcankaya’ → Paste the folder. Open your phone install the. apk. Then run the Mobile Application.
- **Important:** Make note that your phone version need to at least Android 4.4 KitKat to running your program.

8.2.3 Compiling and Running for Python

- Copy the source file of Python code and .png files in same dictionary. (Optional: You can paste the source file to ‘/home’ dictionary, it will easy to find it.)
- Open Idle → Open source code → Compile the Source code.

There are two ways to running the Python code;

- Running the project from Idle
- Copy our executable folder named ‘Touchscreen’ in any dictionary. (Optional: You can paste the source file to ‘/home’ dictionary, it will easy to find it.) → Open terminal → Type ‘cd Touchscreen && ./Touchscreen’. Our program will start automatically.

8.3 System Requirements

There are no specific system requirements to compile or run our project.

8.3.1 Installation

Download our project from [here](#).

Note: If there is any compilation or run time error, please contact with us.

Please refer to User manual before using the application to proper use.

9. User Manual

9.1 Overview

Adroit System for Online Time Table and Announcement is a real-time communication and an informative project that aims to replace the current paper-based announcement and time table methods. Another objective is to ease the communication between the teachers and students by using real-time communication. There will be different interfaces for students and teachers.

On students' side, they will only be able to interact with the touchscreen. They will be able to send messages to the teacher by using already determined message templates to avoid objectionable content, see the teacher's time table, announcements and if published.

On teachers' side, by using the Wi-Fi connection between Raspberry Pi and their PC or mobile application, they will be able to make changes to their time table such as adding meetings, office hours, rendezvous for meeting students, publishing new announcements. To be able to do all these actions, teachers must login to their pre-determined accounts. These accounts will be created to prevent students using those abilities.

On admins' side, by using the website, they will be able to add a teacher to the database and to verify the device.

9.2 User Interface & How to use

9.2.1 Website

The website has been implemented for the use of teachers and admins. According to user type, the pages they use will change. First of all, all users have to login to the system by entering email and password for performing various actions by clicking login button (Figure 34). If user clicks on the remember me box, the user name will be automatically written on the next login.

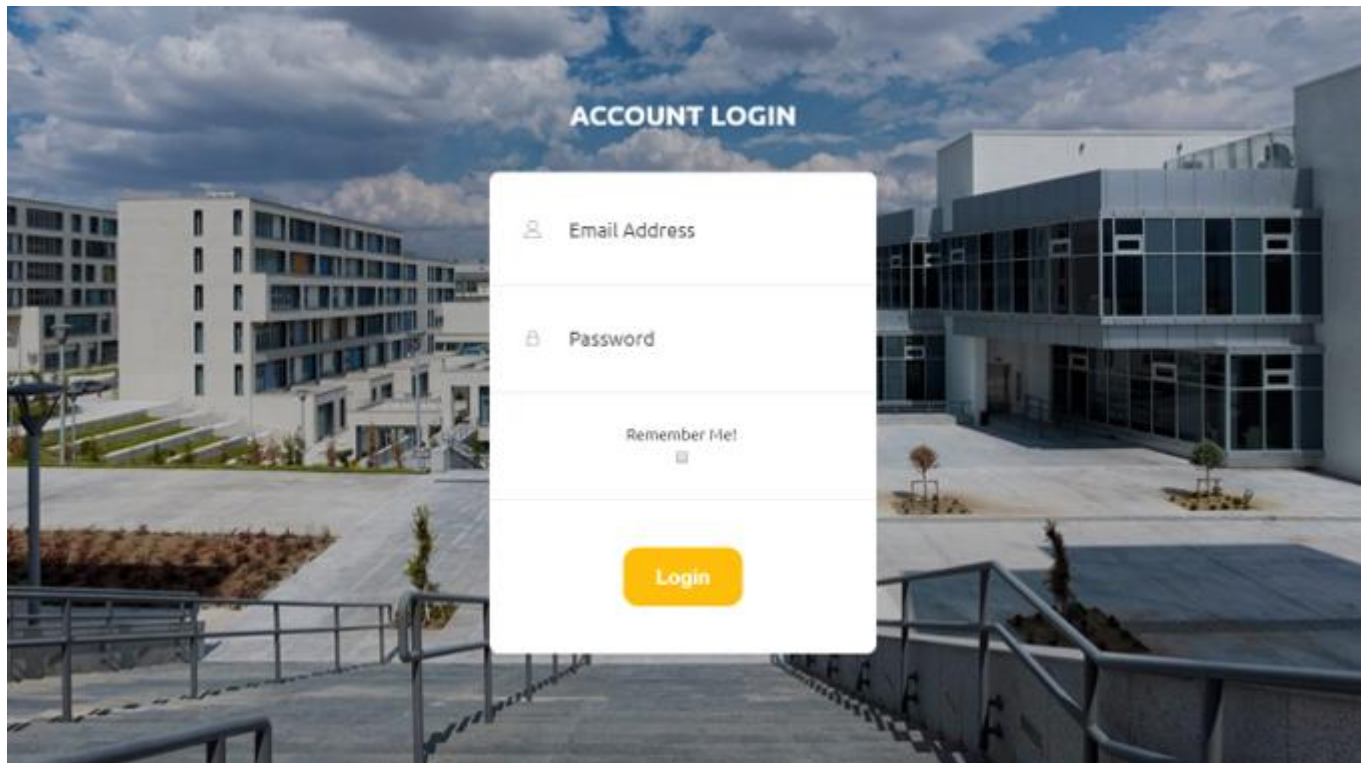


Figure 34: Website Login Page

If you are a teacher, you will see and use this homepage (Figure 35). There are four buttons; timetable button, announcements button, email button and logout button. You can go to timetable page by clicking timetable button. You can go to announcement page by clicking announcement button. You can go to emails page by clicking the email button. You can logout from the system by clicking logout button.

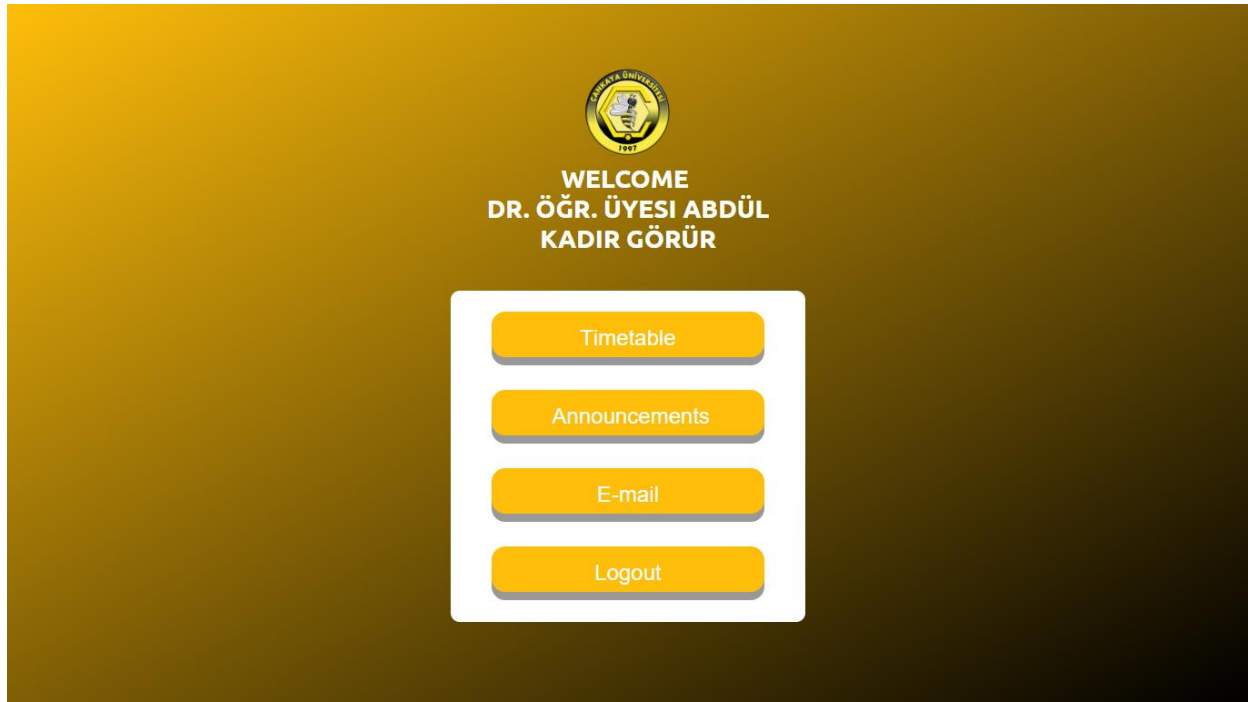


Figure 35: Website-TeacherHomepage

This page is the Timetable Page (Figure 36). You can add extra hours into your timetable by selecting day, hour and content. Also, you can delete all the added extra hours in Timetable page. By clicking homepage button, you come back to Teacher Homepage (Figure 35).



Figure 36: Website-Timetable

This page is the Announcement Page (Figure 37). You can see all the published announcements with their published date by clicking the all announcements button. If the ‘Last Day’ warning it appears for any announcement, it is the last day for this announcement before it expires.

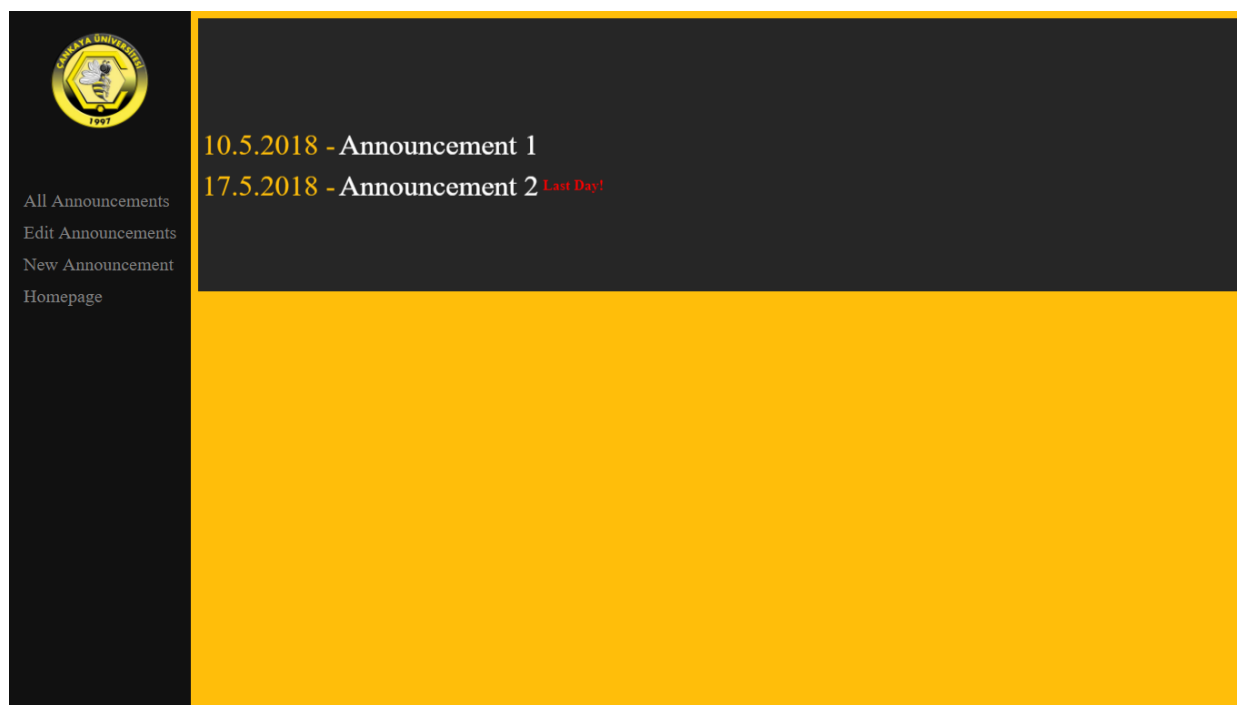


Figure 37: Website-Announcement

You can go to edit announcements page by clicking the edit announcement button. This page is the Edit Announcements Page (Figure 38). You can select any announcement to perform actions by clicking the select button appearing on the gridview. After clicking the select button, you can update your announcement content via textboxes and by clicking the update announcements button. After clicking the select button, you can choose not to perform any action by clicking the exit button appearing on the gridview. You can remove an announcement by clicking the remove button appearing on the gridview.

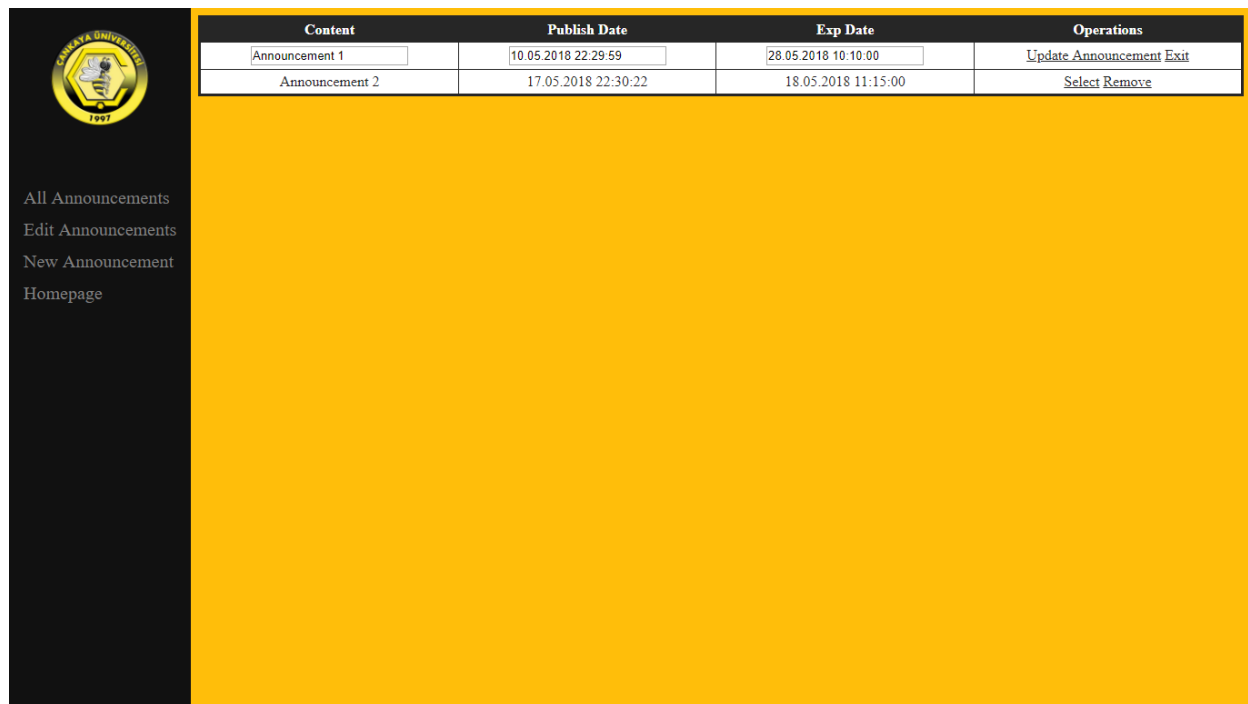


Figure 38: Website- EditAnnouncement

You can go to publish announcements page by clicking the new announcement button. This page is the New Announcement Page (Figure 39). You can publish a new announcement after filling the content textbox, selecting an expire date and clicking the publish button.

Content:

Expire Date:

gg . aa . yyyy -- : --

Publish

Figure 39: Website-NewAnnouncement

You can go to emails page by clicking the email button. You can see the received emails by clicking the inbox button on the email page. This is the Inbox Page (Figure 40). You can select any emails to perform actions by clicking the select button appearing on the gridview. You can go to Çankaya University Webmail service by clicking the webmail button.

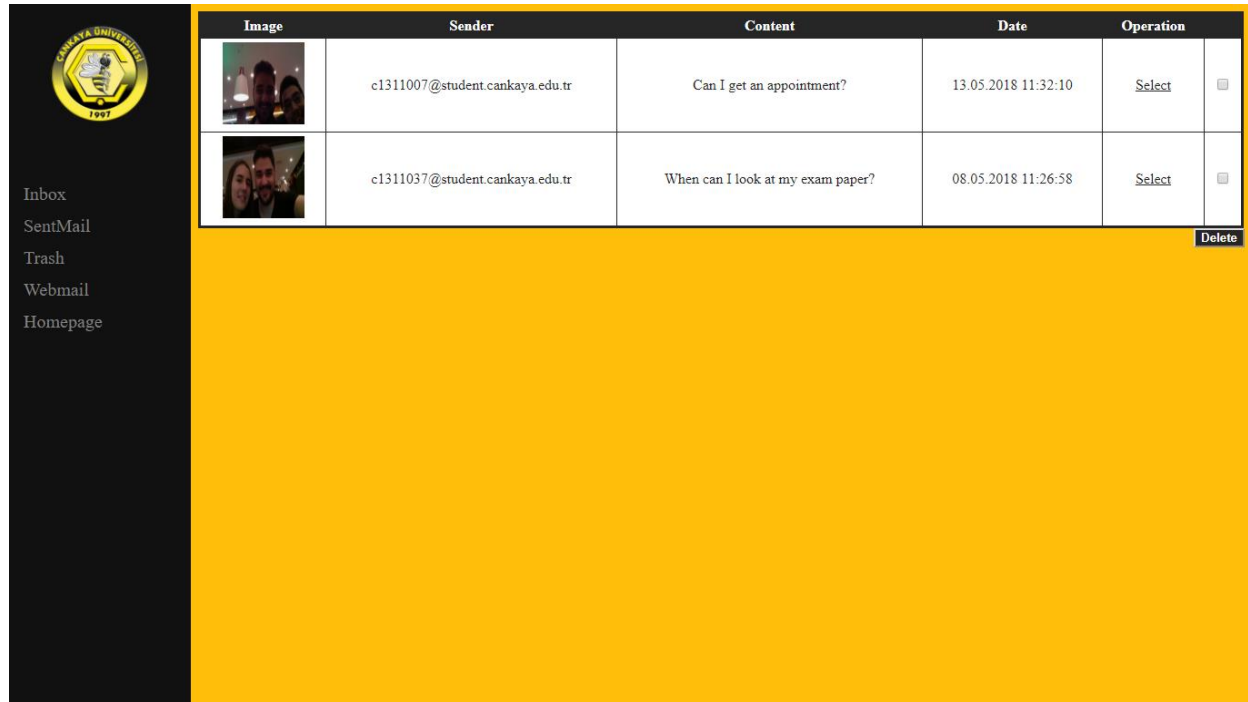


Figure 40: Website-Email

After clicking on the select button, you can reply an email by clicking the reply button appearing on the gridview. After clicking the reply button, you can send replies to the students by writing an email content and clicking the send button. After clicking the select button, you can choose not to perform any action by clicking the exit button appearing on the gridview. After selecting emails by clicking on the checkboxes, you can delete the selected emails by clicking the delete button. (Figure 41)

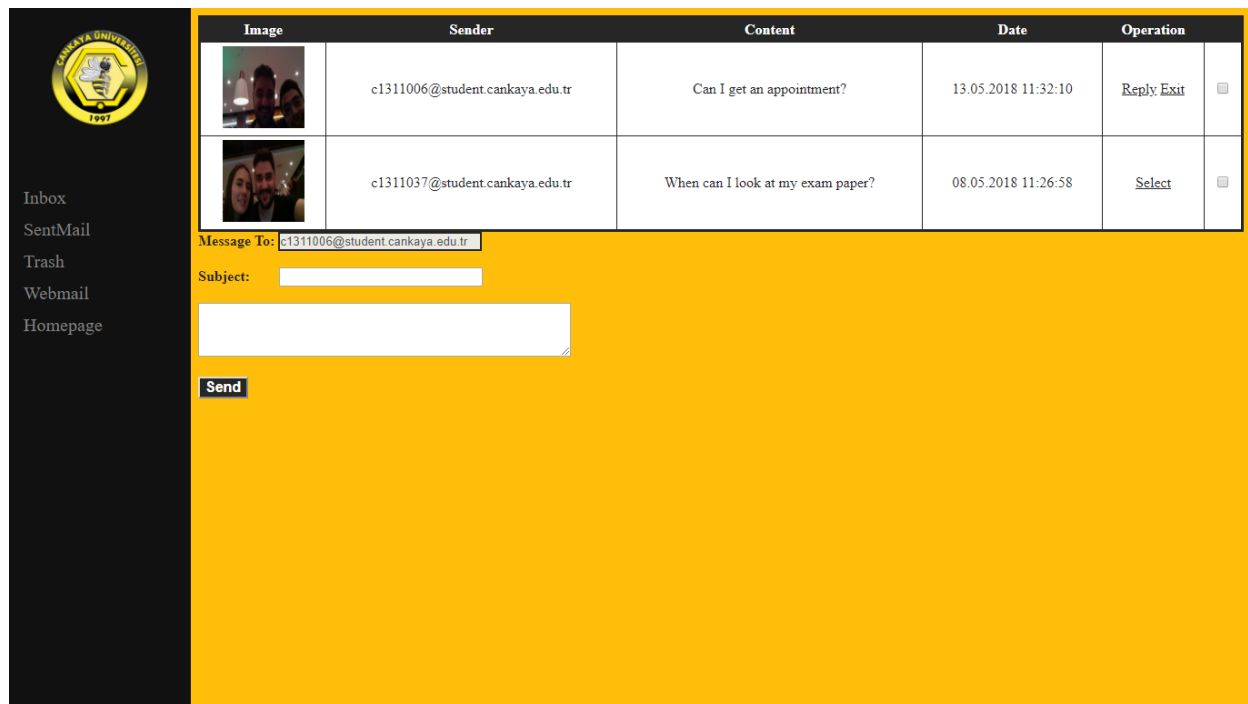


Figure 41: Website-ReplyEmail

You can see the emails sent to the students by clicking the sent mail button. This is the Sent Mail Page (Figure 42). After selecting emails by clicking on the checkboxes, you can delete the selected emails by clicking the delete button.

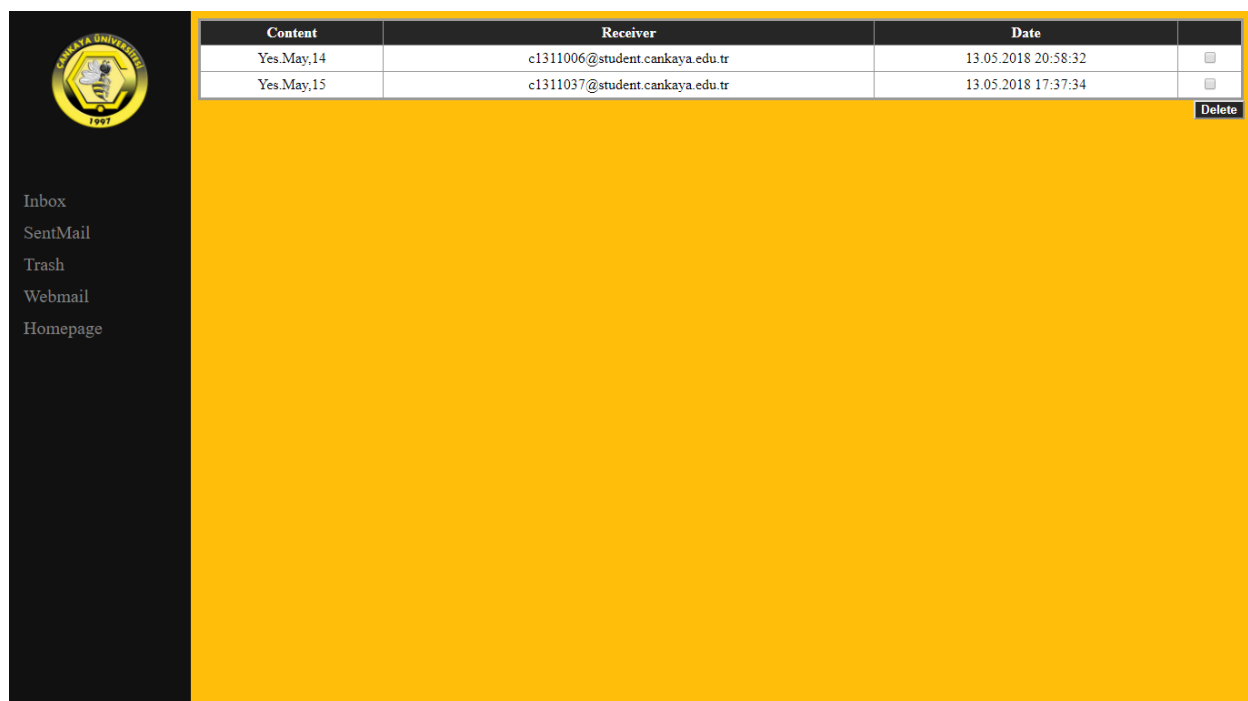


Figure 42: Website- SentEmail

You can see the deleted emails by clicking the trash button. This is the Trash Page (Figure 43). After selecting emails by clicking on the checkboxes, you can delete the selected emails permanently by clicking the delete button.

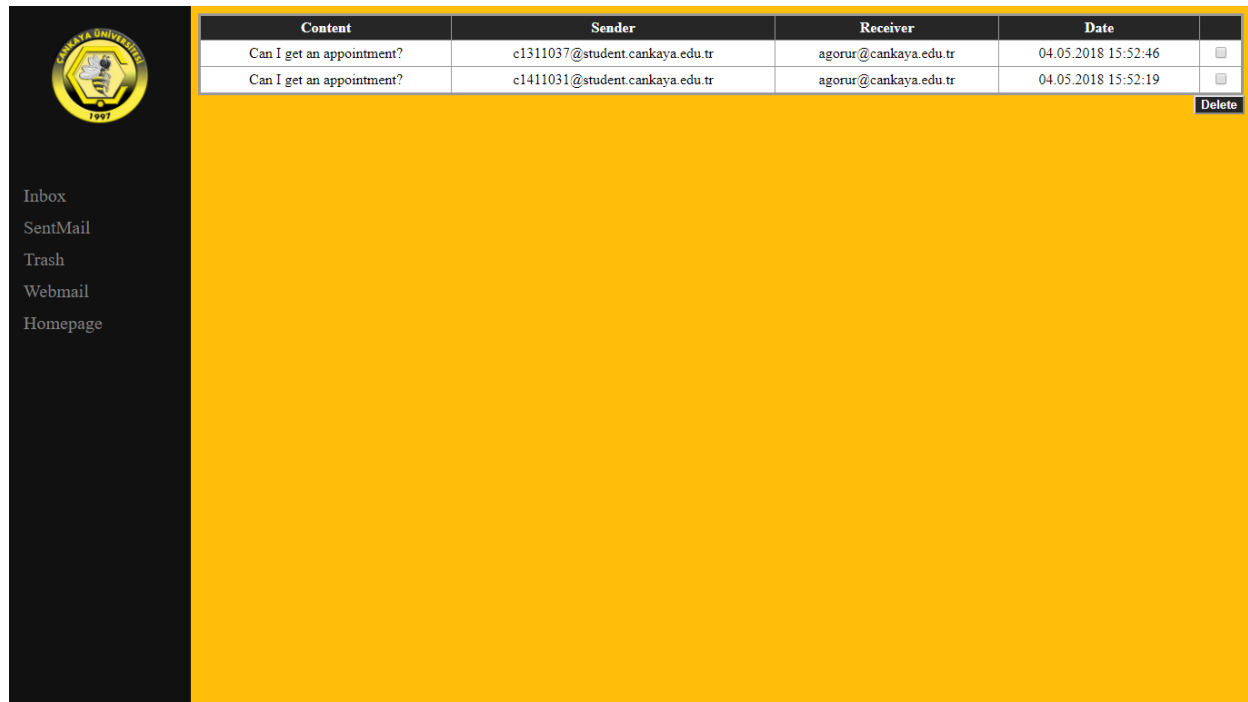


Figure 43: Website-TrashEmail

If you are an admin, you will see and use this homepage (Figure 44). There are three buttons; Verify the Device button, Add a Teacher button and Logout button. You can go to Verify the Device page by clicking Verify the Device button. You can go to Add a Teacher page by clicking Add a Teacher button.

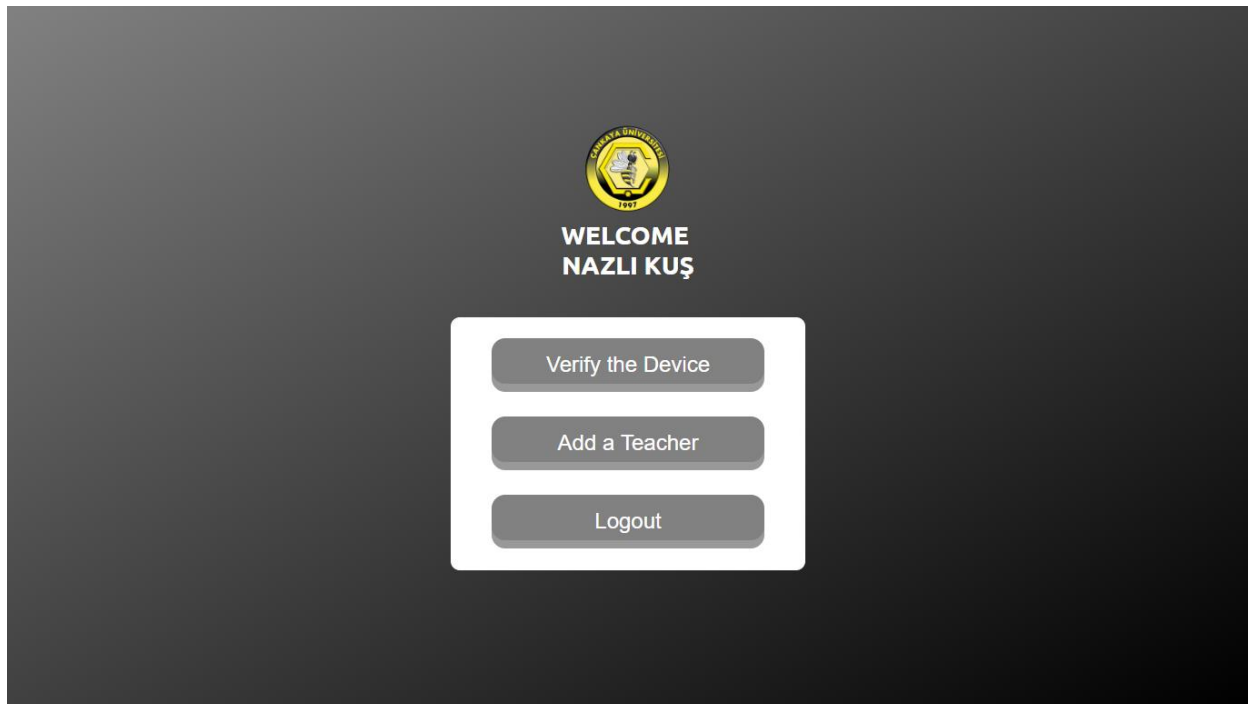


Figure 44: Website-AdminHomepage

You can go to verify the device page by clicking verify the device button. This is the Verify the Device Page (Figure 45). Device Id automatically comes up. You cannot change the Device Id. You can write new code for the device.

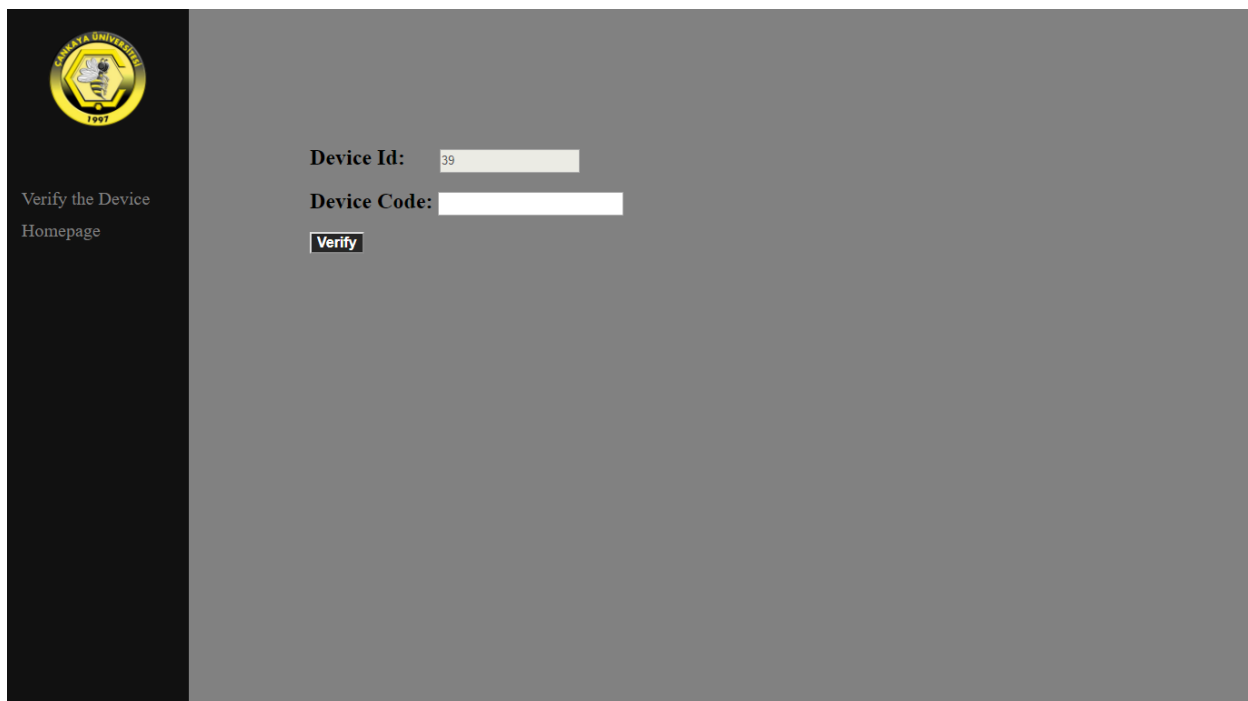
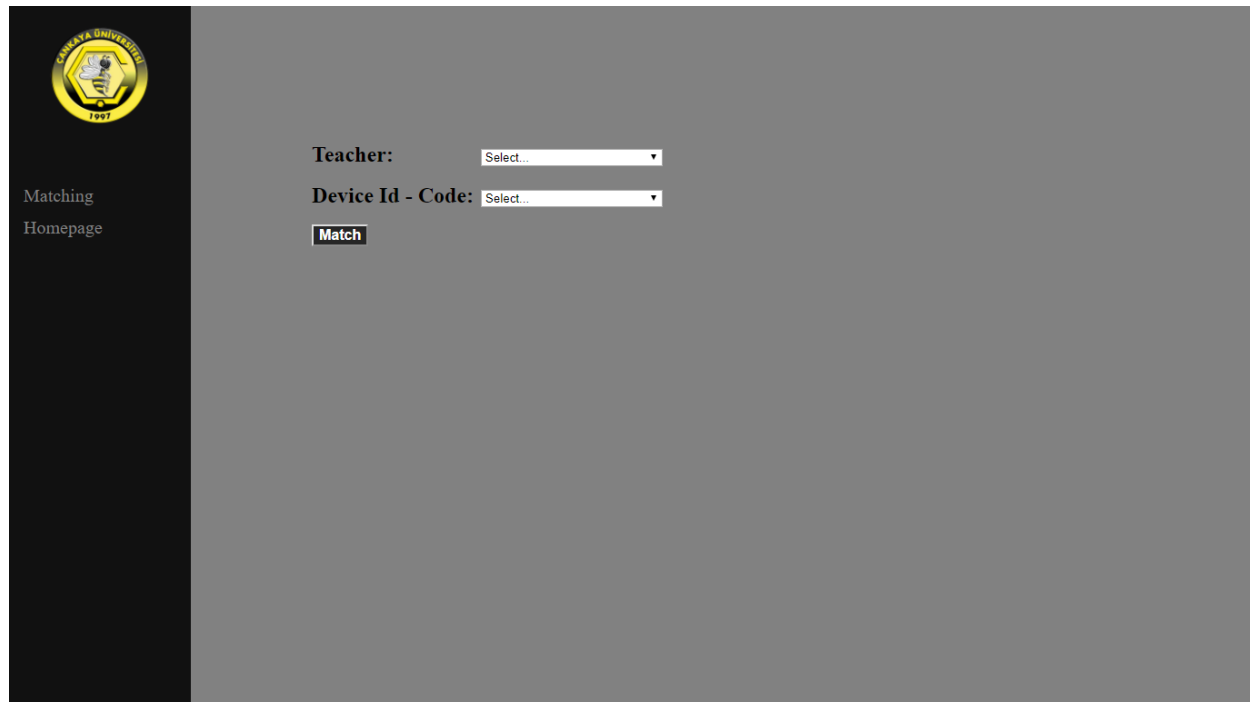


Figure 45: Website- VerifytheDevice

You can go to add a teacher page by clicking add a teacher button. This is the Add a Teacher Page (Figure 46). You can select a teacher and a device that are available. After these selections, by clicking the match button, you can match them.



The screenshot shows the 'Add Teacher' page. On the left sidebar, there is a yellow circular logo for Kanva University (founded 1997) and two links: 'Matching' and 'Homepage'. The main area is a light grey rectangle. It contains two labels with corresponding dropdown menus: 'Teacher:' followed by a dropdown showing 'Select...', and 'Device Id - Code:' followed by another dropdown showing 'Select...'. Below these two dropdowns is a small black button with the word 'Match' in white text.

Figure 46: Website-AddTeacher

9.2.2 Touchscreen

The website has been implemented for the use of students. If you are a student, you can use touchscreen to communicate with the teacher. You can navigate between the pages by using right arrow button and left arrow button. Timetable of the teacher displays to you on the main page of the touchscreen (Figure 47). If you click the right arrow button, you go to Email page. On the other hand, if you click the left arrow button, you go to Announcement page.

| Asst. Prof. Dr. Abdül Kadir GÖRÜR | | | | | |
|-----------------------------------|----------------|----------------|----------------|----------------|----------------|
| | Monday | Tuesday | Wednesday | Thursday | Friday |
| 09.20 | | | CENG218 (LB05) | | |
| 10.20 | | Office Hour | CENG218 (LB05) | | |
| 11.20 | CENG218 (LB06) | | | CENG218 (H315) | |
| 12.20 | CENG218 (LB06) | | | CENG218 (H315) | CENG218 (LB06) |
| 13.20 | | CENG218 (H335) | | | CENG218 (LB05) |
| 14.20 | | CENG218 (H335) | | | |
| 15.20 | | | | | CENG218 (H302) |
| 16.20 | | | | | CENG218 (H302) |

Figure 47: Touchscreen- Timetable

You can send an email to the teacher by selecting a template message and typing in their email address (Figure 48). You can select one of four template messages by clicking on the selected one. By clicking the numbers on the numpad, you can enter their student numbers. You can delete a number they entered by clicking the del button. You can delete all the entered numbers by clicking the res button. If you click the right arrow button, you go to Announcement page. On the other hand, if you click the left arrow button, you go to Timetable page.

Asst. Prof. Dr. Abdül Kadir GÖRÜR

Enter E-Mail: c @student.cankaya.edu.tr

| | | | |
|---------------------------------------------|-----|---|-------|
| Can I get an appointment? | 7 | 8 | 9 |
| When can I look at my exam paper? | 4 | 5 | 6 |
| I came but I could not find you. | 1 | 2 | 3 |
| May I get information about the Lab lesson? | Del | 0 | Reset |

Figure 48: Touchscreen-Email

Announcements published by the teacher displays to you on announcement page (Figure 49). If you click the right arrow button, you go to Timetable page. On the other hand, if you click the left arrow button, you go to Email page.

Asst. Prof. Dr. Abdül Kadir GÖRÜR

Announcement 1 2018-05-10

Announcement 2 2018-05-17

Figure 49: Touchscreen- Announcement

9.2.3 Mobile Application

The mobile application has been implemented for the use of teacher. If you are a teacher, you can use mobile application to communicate with the students. You have to login to the system by entering email and password for performing various actions by clicking login button (Figure 50).

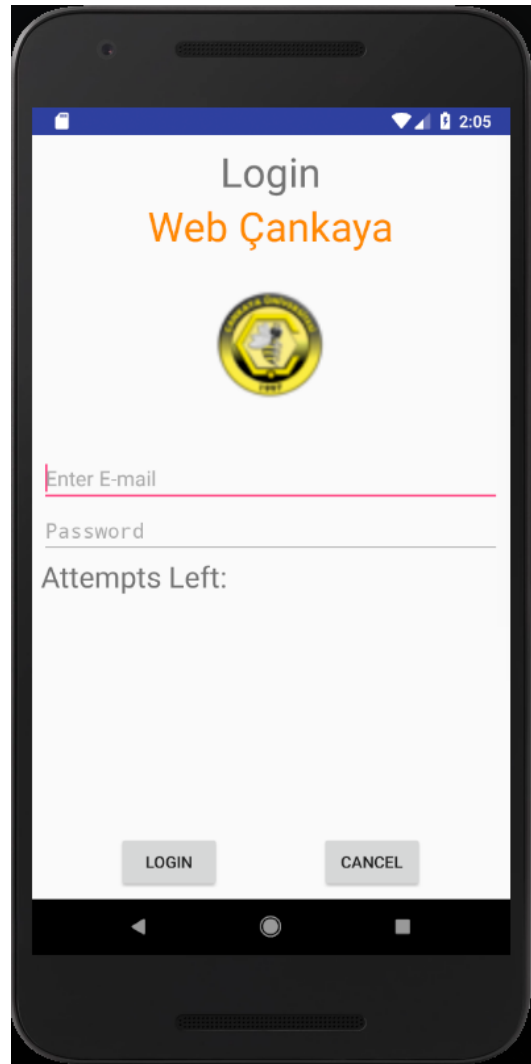


Figure 50: Mobile Application-Login Page

There are four buttons; timetable button, announcements button, email button and logout button. You can go to timetable page by clicking timetable button. You can go to announcement page by clicking announcement button. You can go to emails page by clicking the email button. You can logout from the system by clicking logout button. (Figure 51).

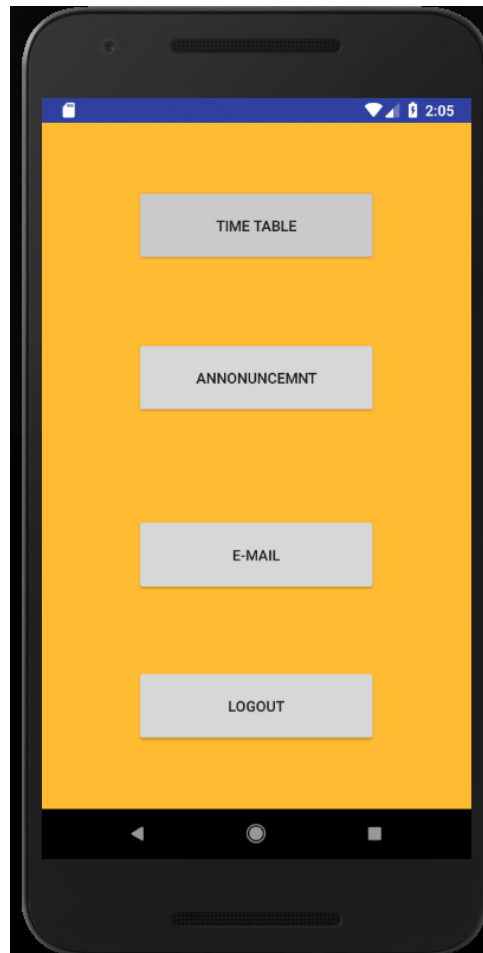


Figure 51: Mobile Application-Teacher Homepage

This page is the Timetable Page (Figure 52). You can add extra hours into your timetable by selecting day, hour and content. Also, you can delete all the edit extra hours in Timetable page. You can see your timetable for Tuesday by clicking the Tuesday button. You can see your timetable for Wednesday by clicking the Wednesday button. You can see your timetable for Thursday by clicking the Thursday button. You can see your timetable for Friday by clicking the Friday button.

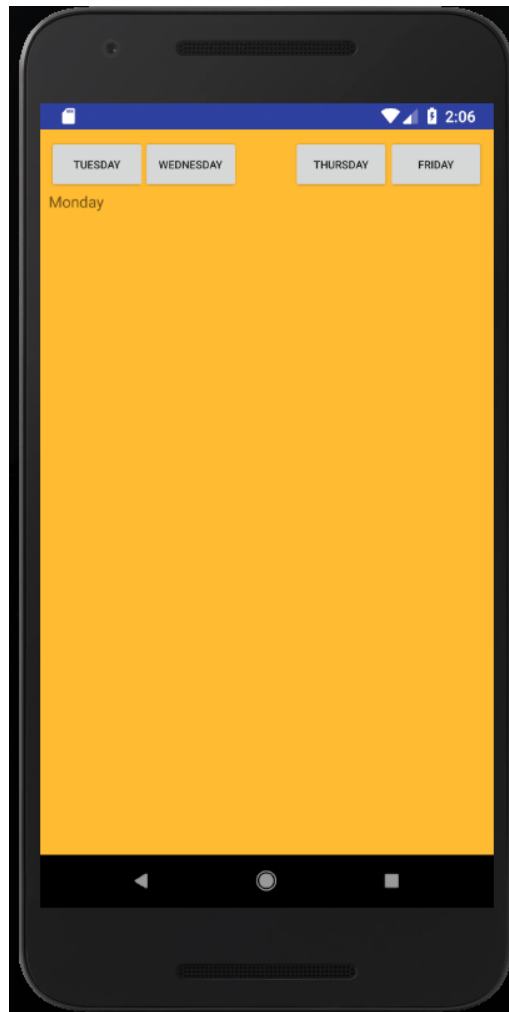


Figure 52: Mobile Application- Timetable

This is the Announcement Homepage (Figure 53). There are two buttons; Publish an Announcement button and Edit Announcement button. If you click the Publish an Announcement button, you are directed to Publish Announcement Page (Figure 54). On the other hand, if you click the Edit Announcement button, you are directed to Edit Announcement Page (Figure 55).

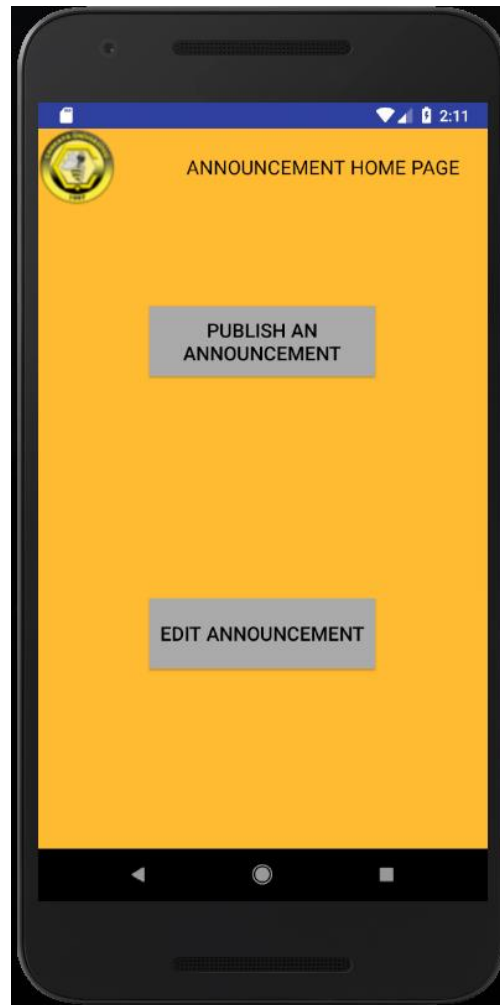


Figure 53: Mobile Application- Announcement Homepage

This is the Publish Announcement Page (Figure 54). You can publish a new announcement after entering a content, selecting an expiry date and clicking the publish button.

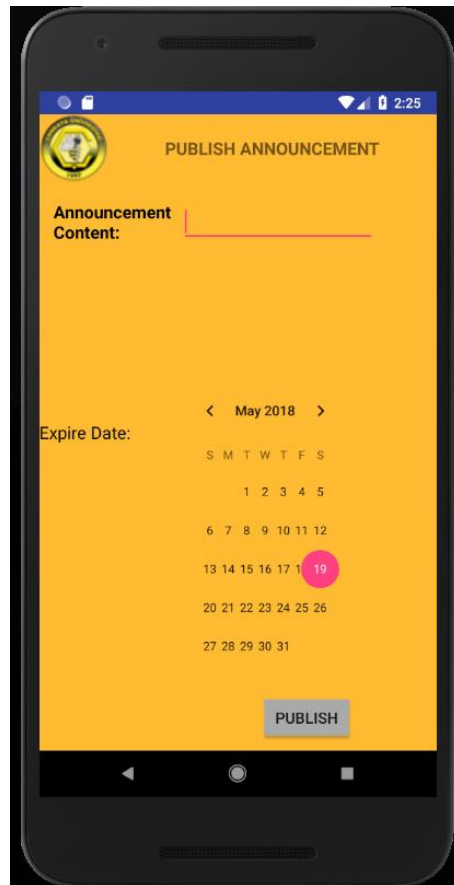


Figure 54: Mobile Application- Publish Announcement Page

This is the Edit Announcement Page (Figure 55). You can update a selected announcement by entering a new content and clicking on the update button. You can delete a selected announcement by clicking on the delete button.

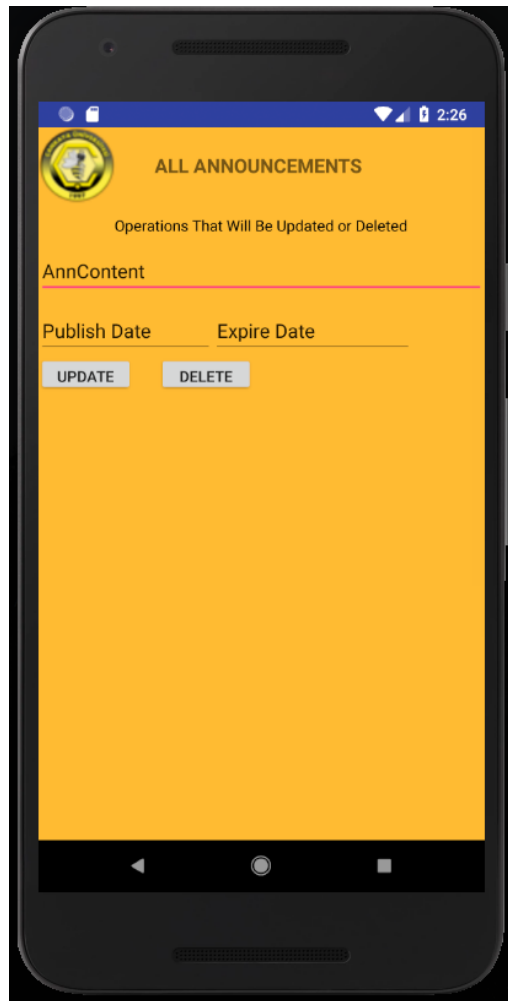


Figure 55: Mobile Application- Edit Announcement Page

This page is the Email Page (Figure 56). You can see all emails in this page. Also, you can send a message with reply button.



Figure 56: Mobile Application- Email Page

This page is the Reply Page(Figure 57). You can reply an email by typing in the sender's email address, message subject and the message content with send button.

Figure 57: Mobile Application- Email-Reply Page

10. Conclusions

This document includes wide information about our project titled as “Adroit System for Online Time Table and Announcement”. In this project, we have aimed to ease the communication and interact, on between teachers and students, and the project will also prevent paper waste. We plan to use latest Technologies such as Raspberry Pi, touchscreen and motion sensor. The purposes of selecting these products are increasing the level of usability, visuality and easy access. Moreover, with its high level of compatibility with other devices, Raspberry Pi provides a wide area to work on compared to other microprocessors and microcontrollers.

To develop this project, we have researched about Raspberry Pi, its usage area and similar projects. We have analyzed the similar projects, and tried to understand how the Raspberry Pi can be used effectively. We have gained a lot of information about Raspberry Pi, the products that can be used with it and how to use them with Raspberry Pi. After doing research for Raspberry Pi, we have researched about database usage and web servers.

Our Project requires data tracking and real-time communication; because of that gaining knowledge and experience about databases and web servers were crucial. After the research was complete, we have prepared SRS and SDD documents. These documents contain requirements and the design principles of the project.

According to our research, there were nearly no projects that was similar to ours. One of the main advantages of our project is preventing the paper waste. By eliminating the paper usage of the teachers on their doors, there will be less papers wasted and the risk of them getting damaged or lost will be avoided. Another big advantage is allowing the students to communicate and interact with the teachers regardless of the teachers' location at that moment. This real-time interaction is very important for an effective communication and interaction. Although there are advantages of this Project, there are some disadvantages, too. The complete product is costly and there can be malfunctions in the Raspberry Pi, touchscreen, motion sensors or the connections to the servers. If there is a failure on one of these, it can also be costly to fix, and the system cannot be used before the fix.

While developing this project, we have gained crucial information and experience on Raspberry Pi, Python, ASP.NET, C#, MySQL and mobile application developments in Android Studio. These information and experiences will be helpful for our future careers.

Acknowledgement

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