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# SYSTEM DESIGN DOCUMENT FOR HOCAM NEREDE



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# **1 INTRODUCTION**

## **1.1 Purpose**

This system design document describes how “Hocam Nerede” will look like. It visualizes how the system will be and makes the expected application more understandable.

## **1.1 Scope**

The system is aiming to bring together people who want to give private course and who want to take courses. Teachers will be rated by students so everyone who used the system can decide which teacher is better to meet up.

## **1.2 References**

IEEE 1016-1998 - IEEE Recommended Practice for Software Design Descriptions.

## **1.3 Overview**

This document is intended to give information to the user about the purpose of the application, how it will look, its interface and so on.

## **1.4 Constraints**

The system will be available on android and IOS and also on web browsers.

## 2 SYSTEM OVERVIEW

### Hocam Nerede

Hocam Nerede is an application that allows teachers to easily create and manage their courses and creates meeting with students who want to take private course. Hocam Nerede was designed for all of the Turkish citizens at the first. The students can comment their teacher after the course and in this way, if the teacher does not a good teacher, the students will be understood that the teacher is a bad teacher

### Background Study

We analyzed several similar applications and we thought what we can add extra. We come to that conclusion there are several mobile applications available to android and IOS. Also, there are several active web pages that brings together people who are teacher and student.

If we look at those applications, we have the following results.

- **OZELDERS.COM**

Özel ders is an application that one of the active web applications. This Web application is very similar to Hocam Nerede in terms of functionalities. But we are aiming to develop Hocam Nerede as a mobile application.

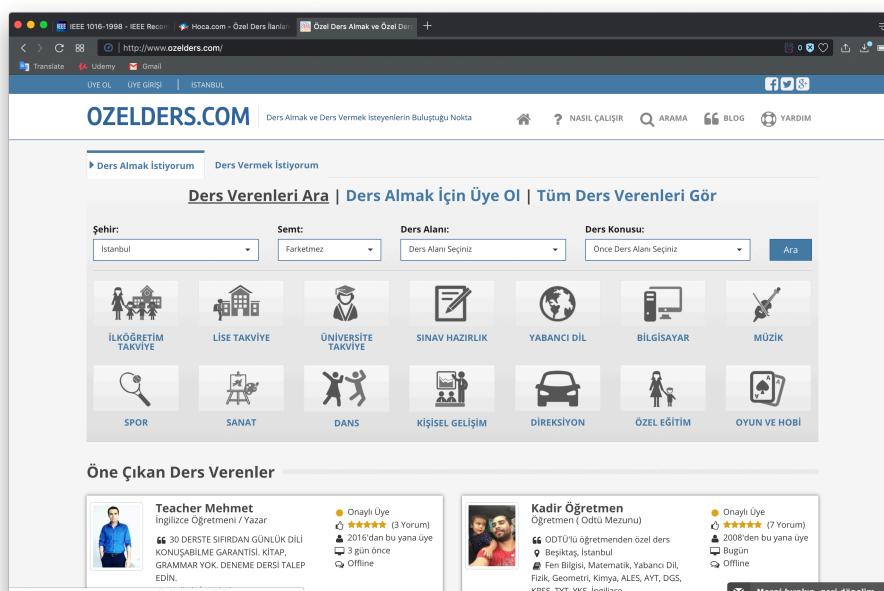


Figure 1 – ozelders.com

- **HOCA.COM**

This web application also has a mobile app but its only available for android devices. Colors are more vivid. Design of this web application is more characteristic than the design of the OZELDERS.COM.

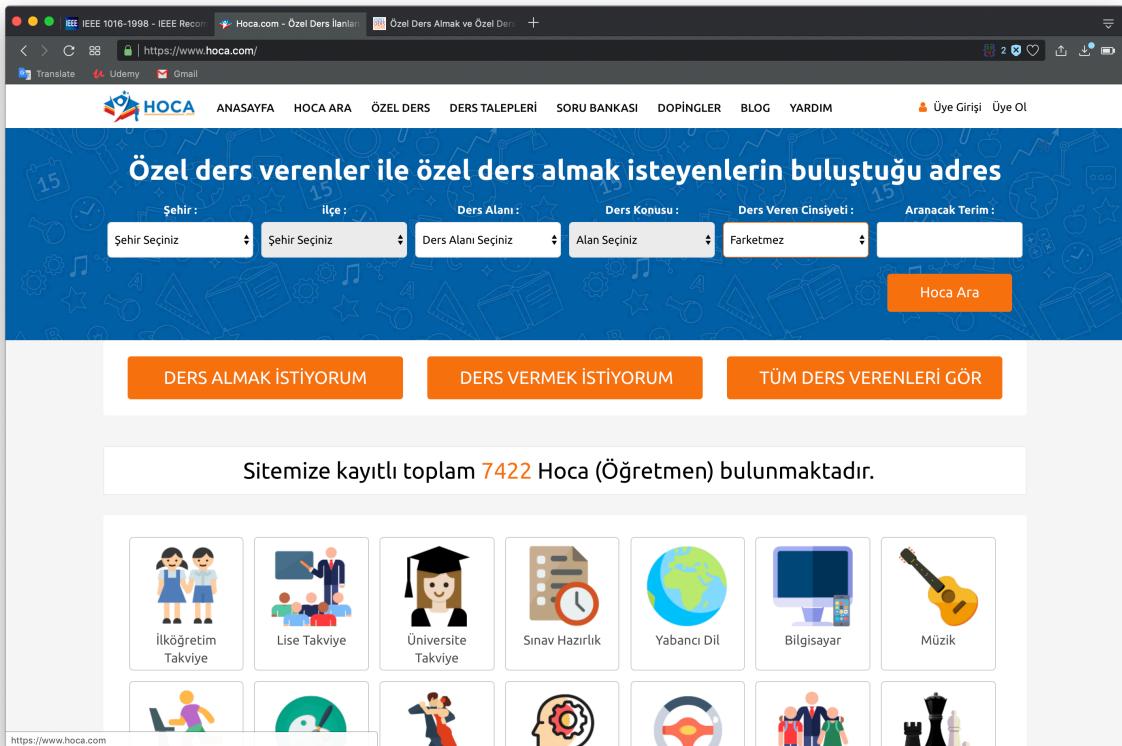


Figure 2 – hoca.com

- **Mobile Application for HOCA.COM**

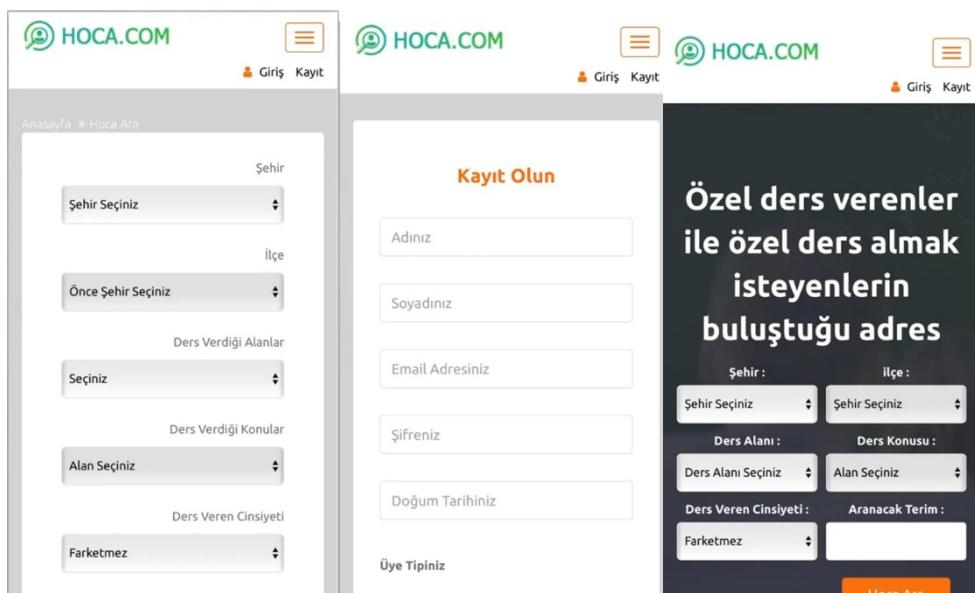
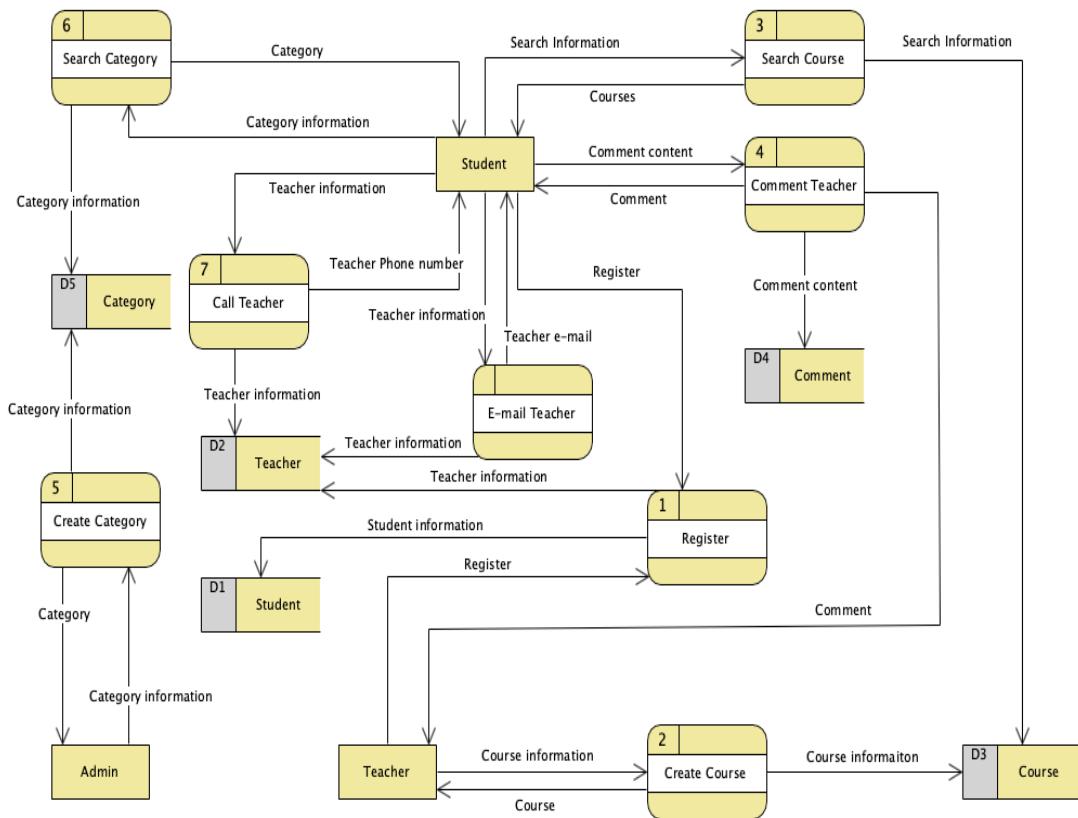


Figure 3 – hoca.com mobile application

## 2.1 Context Diagram

The figure 4 below shows Context diagram that is drawn for Hocam Nerede System. It shows the participants who will interact with the system called the external entities and shows datastores where will save data. In this example, Admin, Student, Teacher are the entities who will interact with the system. Course, Student, Teacher, Category and Comment are the datastores where will save the data.



*Figure 4 - Context Diagram*

### 3 SYSTEM ARCHITECTURE

As shown on the figure 5, server stores the database and web application. The server uses a network to share information and applications. Clients access application via internet.

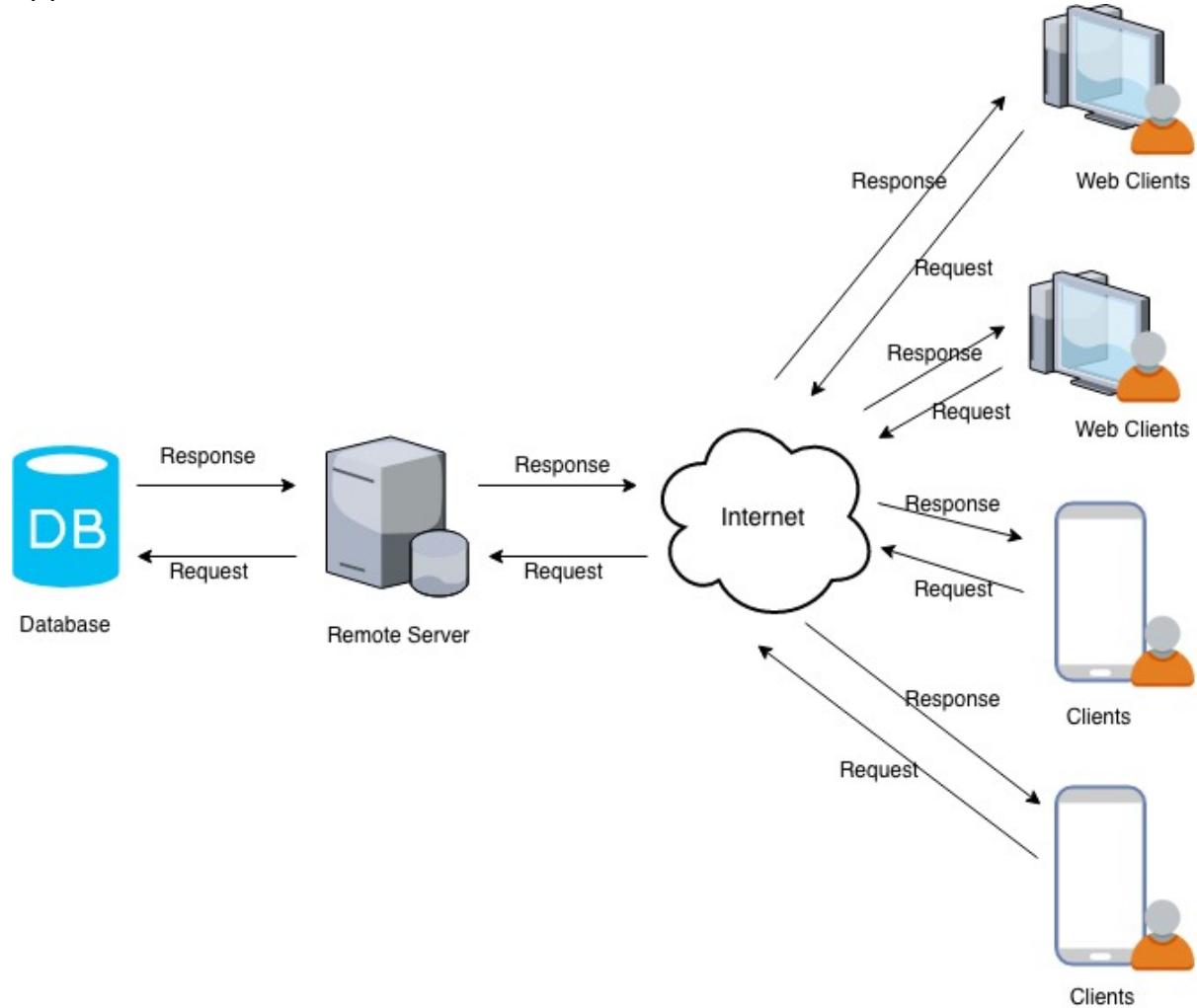


Figure 5 - Architecture Diagram

#### 3.1 Description of the Design Components

**Database:** A database is an organized collection of data. It is the collection of schemas, tables, queries, reports, views, and other objects.

**Remote Server:** The presentation tier consists of HTML, CSS and JavaScript, the application logic tier runs on a web server in form of ASP.NET, PHP etc., and the data tier consists of a database of some kind (mysql, postgresql, a noSQL database etc.).

**Internet:** A means of connecting a computer to any other computer anywhere in the world via dedicated routers and servers.

**Clients:** The terms imply the entire user machine or refer to a handheld device that provides Web access.

### 3.2 Design Rationale:

**Remote Server:**

We choose a cloud server model to achieve a more cheaper and maintainable system by using layered architecture.

**Mobile:**

Smart phones are much easier to carry than the tablets. Also, they are extensively used and our system needs a smart phone to read the QR code to achieve communications. No other alternative technology is used as much as mobile systems.

## 4 Data Design

### 4.1 Functional

#### 4.1.1 Student Actions

**FS1:** Student should open the website or mobile application system. There are 3 options such as open by website, open by android and open by IOS.

**FS2:** Student downloads mobile application to phone.

**FS3:** Student should register to system.

**FS4:** Student should login to the system.

**FS5:** Student should search for a course.

**FS6:** Student should choose teacher for that specific course.

**FS7:** Student should make contact to teacher via telephone number or E-mail address displayed on teacher's profile.

**FS8:** Student should scan QR code generated on teacher's system.

**FS9:** Student should rate and comment the taken course.

**FS10:** Student should logout the system.

#### 4.1.2 Teacher Actions

- FT1:** Teacher should open the website or mobile application system. There are 3 options such as open by website, open by android and open by IOS.
- FT2:** Teacher should register and login to the system.
- FT3:** Teacher should view current course list.
- FT4:** Teacher should edit profile information.
- FT5:** Teacher should edit course information and schedule.
- FT6:** Teacher should open QR code generator on system.
- FT7:** Teacher should answer the comments of His/Her course.
- FT8:** Teacher should logout the system.

#### 4.1.3 Hocam Nerede System Actions

- FH1:** Hocam Nerede system should provide registration form for users.
- FH2:** Hocam Nerede mobile system should redirect teachers that want to register to Hocam Nerede web registration site.
- FH3:** Hocam Nerede system should send verification E-mail to admin.
- FH4:** Hocam Nerede system should send information E-mail.
- FH5:** Hocam Nerede system should send confirmation E-mail.
- FH6:** Hocam Nerede system should generate QR code.
- FH7:** Hocam Nerede system should enroll the student to that course after scanning of QR code that generated on teacher's mobile system.
- FA8:** Hocam Nerede system should not allow the course and teacher information to non-logged visitors to see.
- FA9:** Hocam Nerede system should calculate weighted average of given rates to teacher and course.
- FA10:** Hocam Nerede system should show top rated teachers.

#### 4.1.4 Administrator Actions

- FA1:** Admin should verify teachers according to teacher's qualifications to register teacher to the Hocam Nerede system.
- FA2:** Admin shall create new categories

## 4.2 Entity-Relation Diagram

Figure 6 shows the Entity Relationship Diagram (ERD) of the system. It shows relationships of tables in our database. The Course, Comment, Student, Teacher, City, Category are represented as entities.

### 4.2.1 Teacher

Teacher entity is used to keep the login details of the teachers. Teacher has the id, name, rating, age, last seen, email, telephone, password, pictureURL and active. Teacher entity is related to City and Course.

### 4.2.2 Student

Student entity is used to keep the login details of the student. Student has the id, name, email and password. Student entity is related to Comment and City.

### 4.2.3 City

City entity will be used for categorizing teacher who live in the same city. City entity has just the id and city name. City entity is related to Teacher and Student.

### 4.2.4 Comment

Comment entity is used to keep course comments. This entity has id, userid, commentid and comment. Comment entity is related to student and course.

### 4.2.5 Course

Course entity is used to keep course information that provided by teacher. This entity has id, categoryid, name, rating, content, pictureURL and price. Course entity is related to Category and teacher.

### 4.2.6 Category

Category entity will be used for categorizing courses. This entity has id, courseid and name. This is related to Course entity.

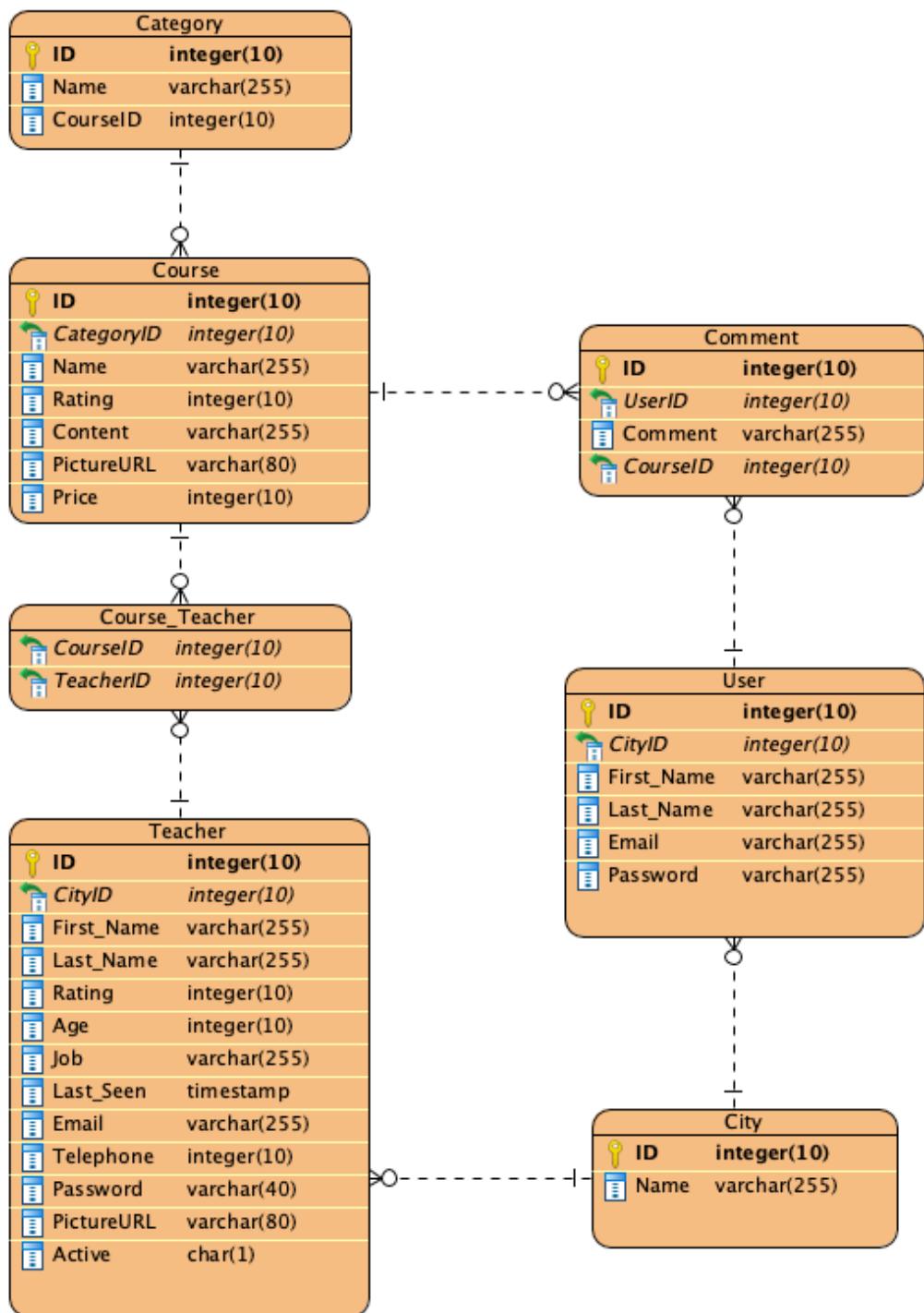


Figure 6 - Entity-Relationship Diagram

## 5 Detailed Design

### 5.1 Class Diagram

UML Class diagram for Hocam Nerede is shown Figure 7. The various classes involved in the system are: Hocam Nerede class diagram occurs 5 classes.

#### 5.1.1 Student Class

Student class is a User. This class includes common operations which are makeCall(), sendEmail(), sendComment(), searchCourse(). This class has comment class.

#### 5.1.2 Teacher Class

Teacher class is also a User. This class includes operations and attributes that are different from the student class. These are job, birthday, rating, telephone, pictureURL, last seen and sex. Common operations are getJob(), getBirthday(), getDocument(), createCourse(). This class has comment and course class.

#### 5.1.3 Course Class

Course class includes operations and attributes. Common attributes are name, price, duration, description. Operations are getName(), getDuration(), getDescription(). This class has category and comment class.

#### 5.1.4 Comment Class

Comment class includes the comment content, date and rating. Also includes some operations getRating() and getComment().

#### 5.1.5 User Class

User is an abstract class. It keeps same attributes that have teacher and student. These are name, city, email and password. And the some operations will be same so this class includes getName(), getCity(), getEmail() and getPassword operations.

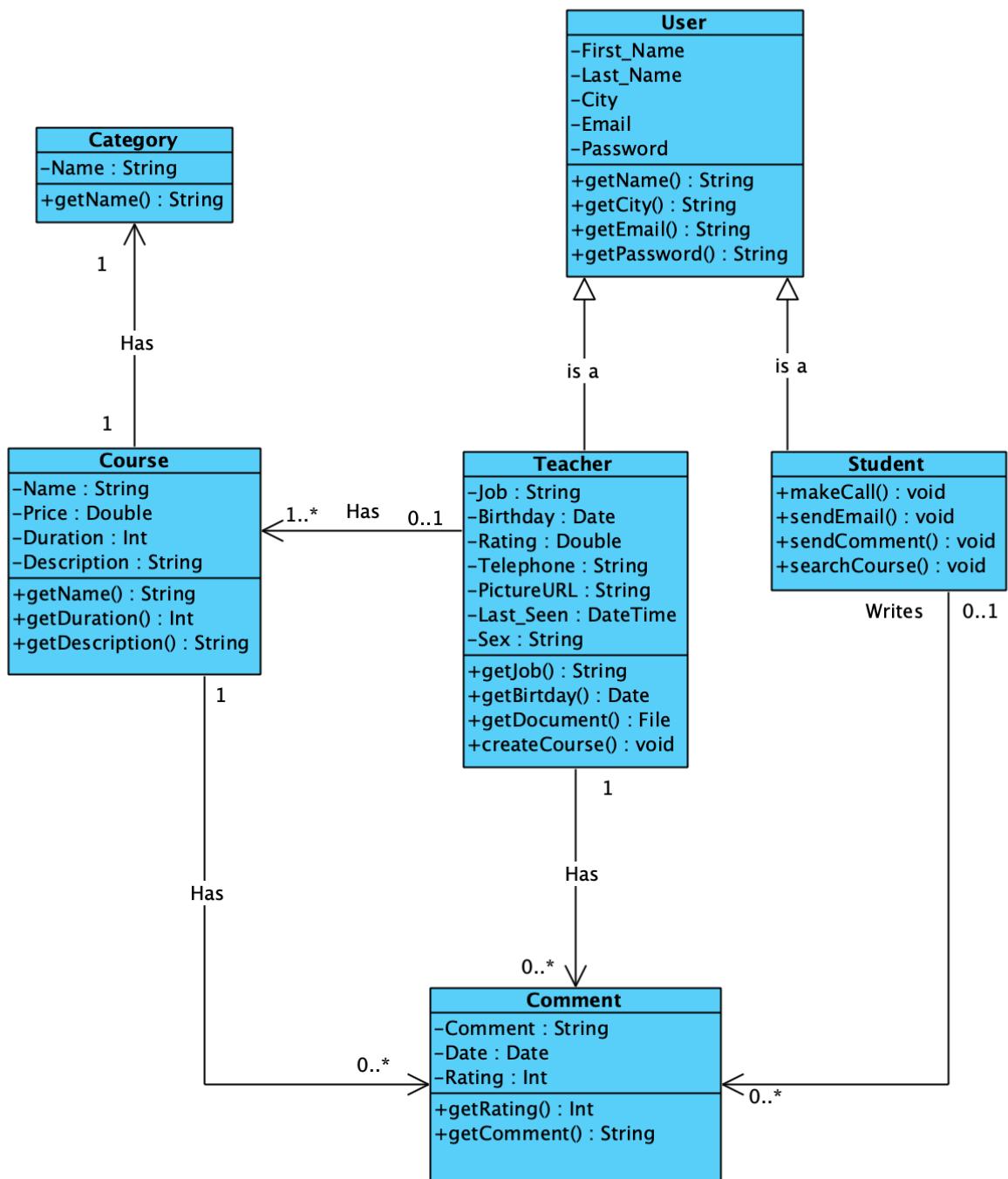


Figure 7 - Class Diagram

## 5.2 Activity Diagram

### 5.2.1 Activity Diagram for Web Registration

The following activity diagrams Show the actions that occur during a particular use-case. Figure 8 shows the steps web registration.

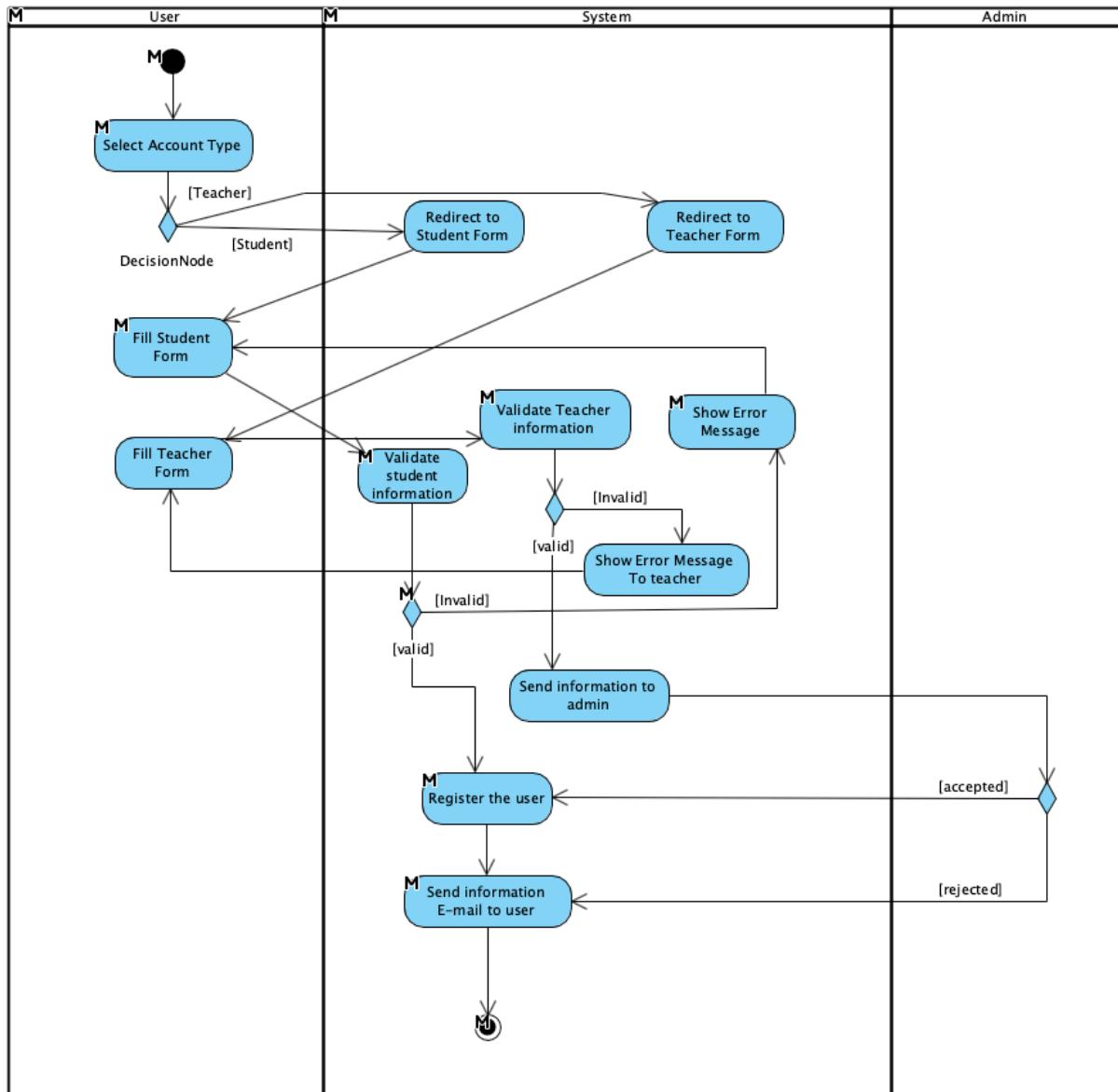


Figure 8 – Activity Diagram for Web Registration

### 5.2.2 Activity Diagram for Web Login

Figure 9 shows the steps web login. This event only occurs if valid username and password is provided.

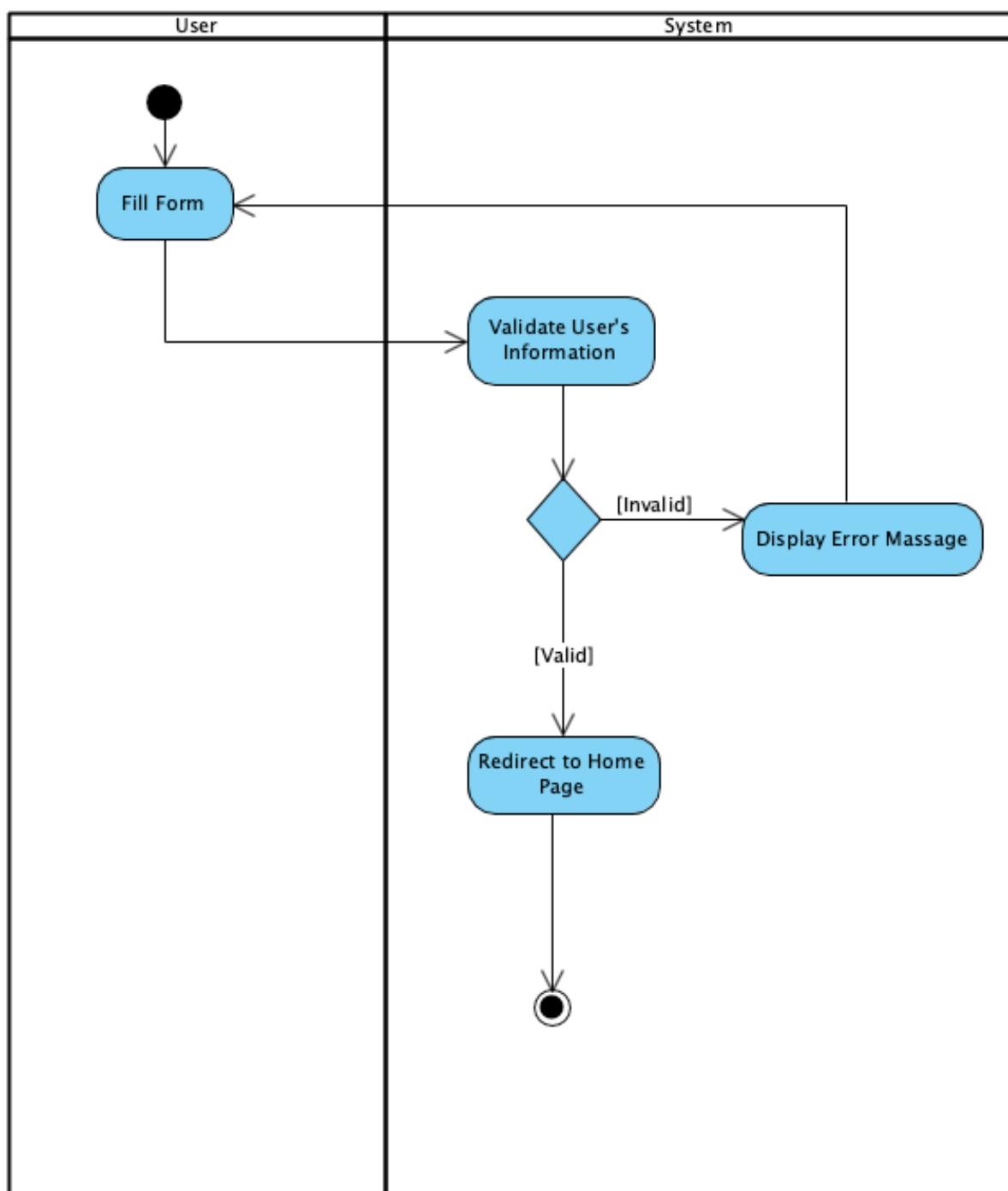


Figure 9 – Activity Diagram for Web Login

### 5.2.3 Activity Diagram for Mobile Registration

Following diagram shows the steps mobile registration. If the teacher tries to register from mobile application, the system will redirect to web application.

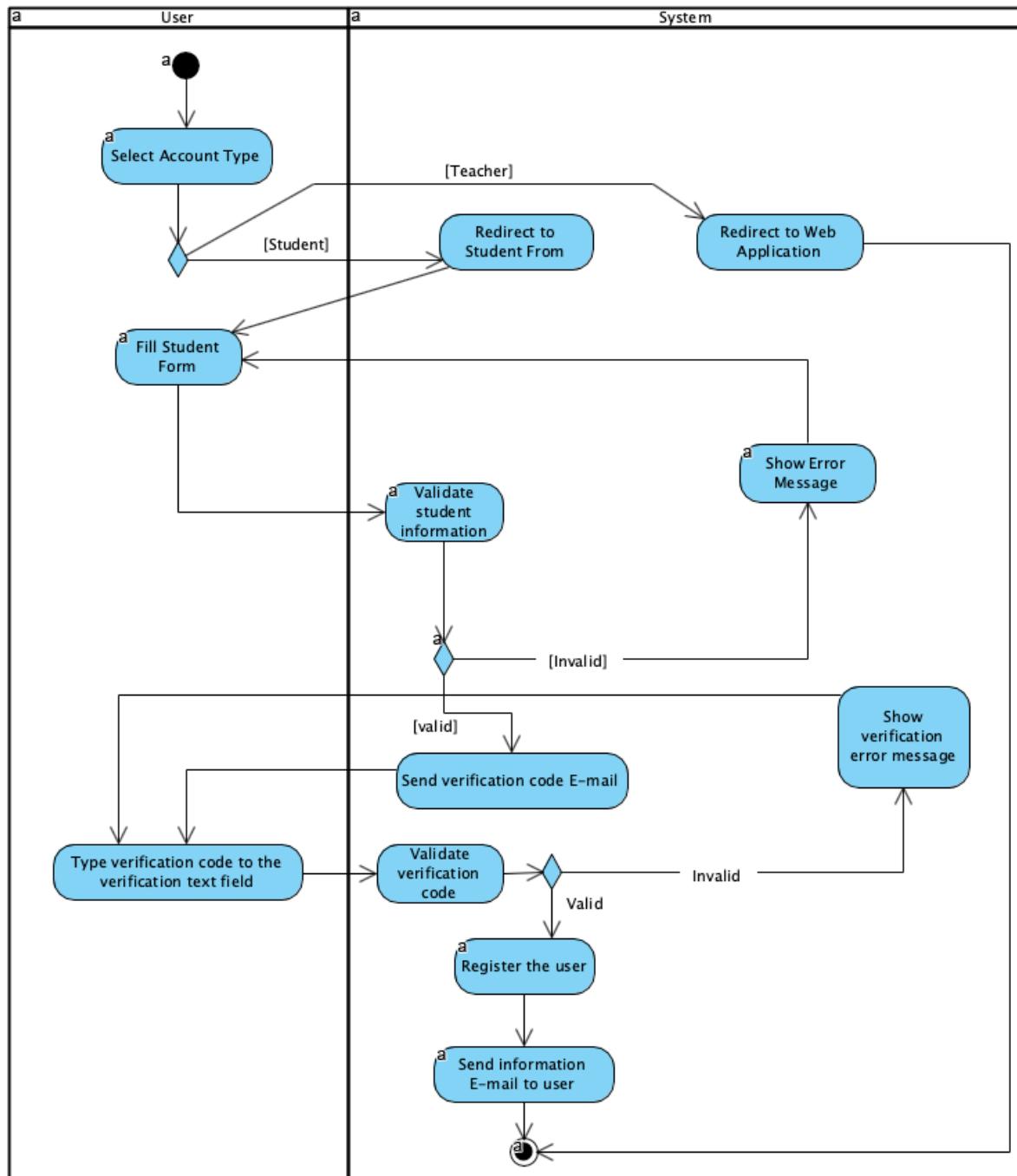


Figure 10 - Activity Diagram for Mobile Registration

#### 5.2.4 Activity Diagram for Searching Course

Figure 11 shows the steps search course.

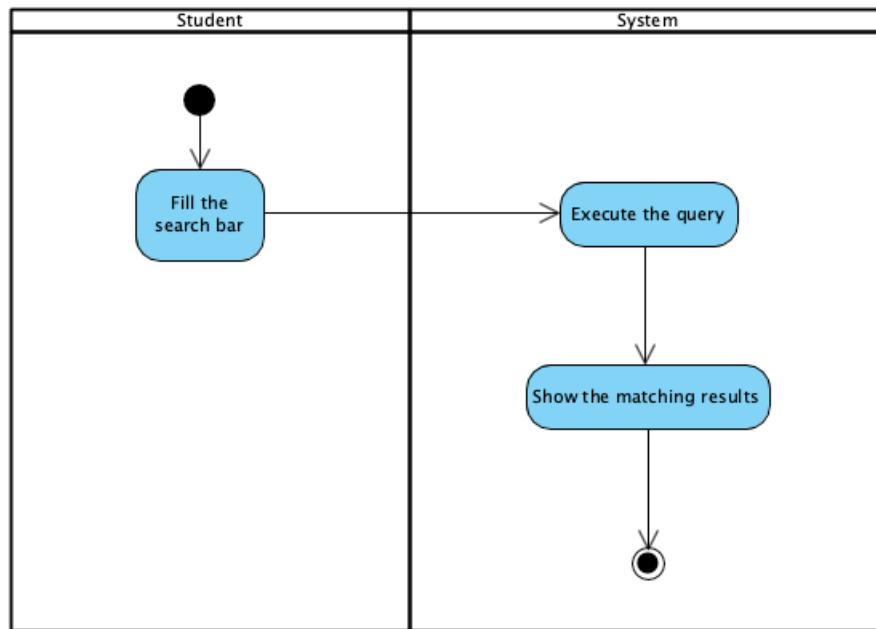


Figure 11 - Activity Diagram for Searching Course

#### 5.2.5 Activity Diagram for Taking Course

Figure 12 shows the steps of taking course and communicating with teacher.

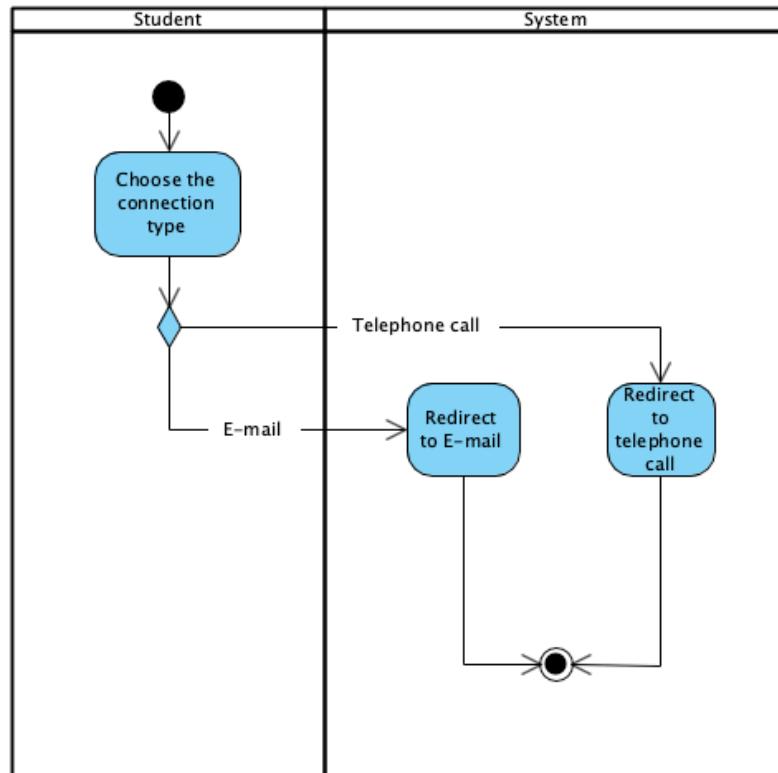


Figure 12 - Activity Diagram for Taking Course

### 5.2.6 Activity Diagram for Comment

Figure 13 shows the steps of comment. This event only occurs if the student's mobile phone can successful read the QR code of teacher's mobile phone.

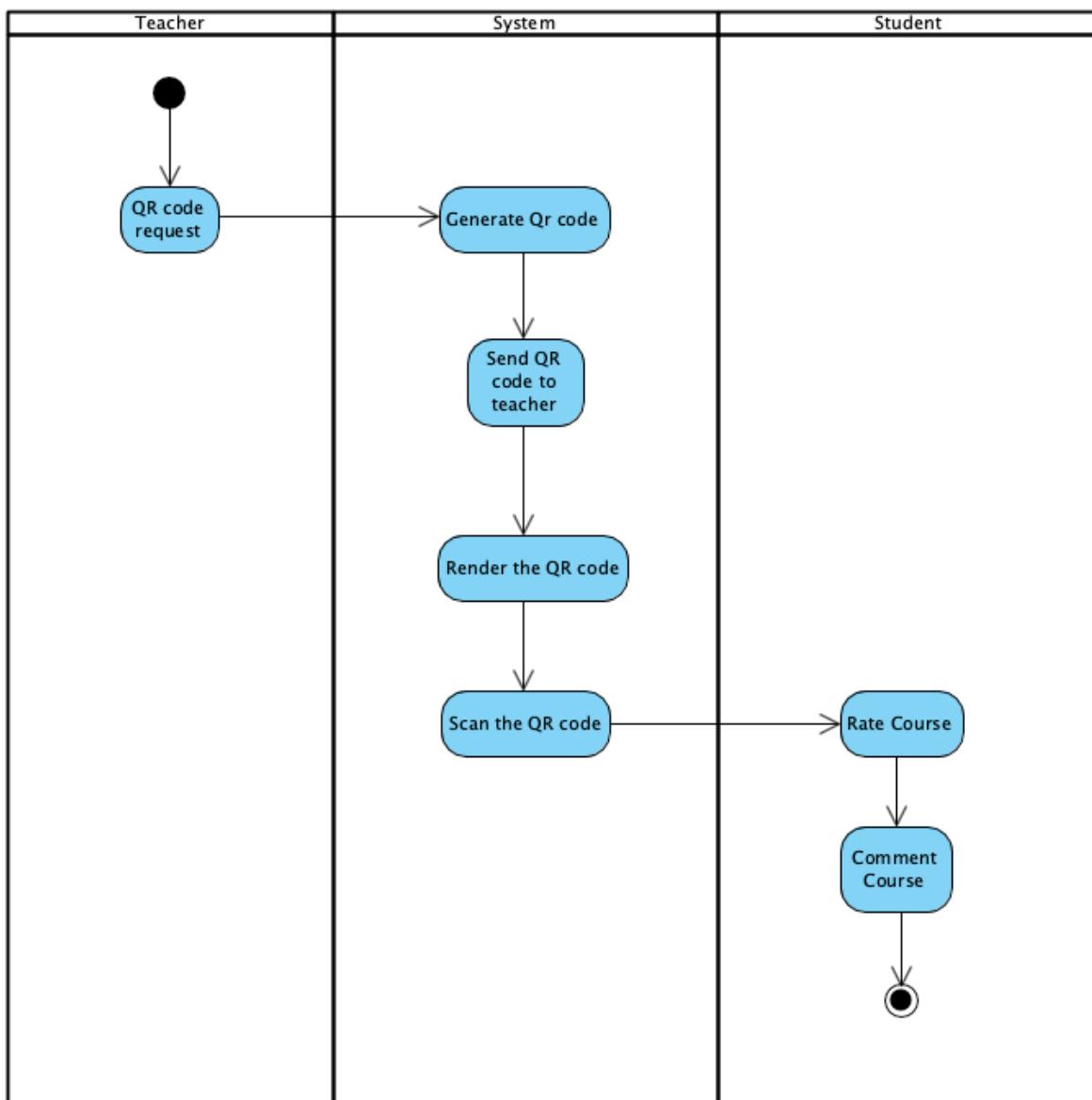


Figure 13 - Activity Diagram for Comment

### 5.3 Use – Case Diagram

Figure 14 shows use case diagram for Hocam Nerede System. There are 4 Actors. Admin, Student, Teacher and Visitor. There are 18 use cases.

#### 5.3.1 Visitor Actor

Visitor can search category, search course, register to system and display comments. But not get teacher's phone number and teacher's email. In order to do that visitor needs to register to the system.

### 5.3.2 Student Actor

Student can login to system but to login system s/he needs to register to system. Also, s/he can get teacher's phone number and teacher's e-mail. In order to that s/he needs to login to system. The student can comment and rate teacher and course, but s/he needs to scan QR code provided that by teacher. Also, students can do whatever can visitors do.

### 5.3.3 Teacher Actor

Teachers can create courses but in order to do that s/he needs to specify course category, course duration, course name, course price. S/he needs to login to system to create a course. Also, teacher can update profile description that he or she own. Teacher can show QR code in order receive comments and starts.

### 5.3.4 Admin Actor

Admin can only create categories and validate teacher reality to avoid some anomaly.

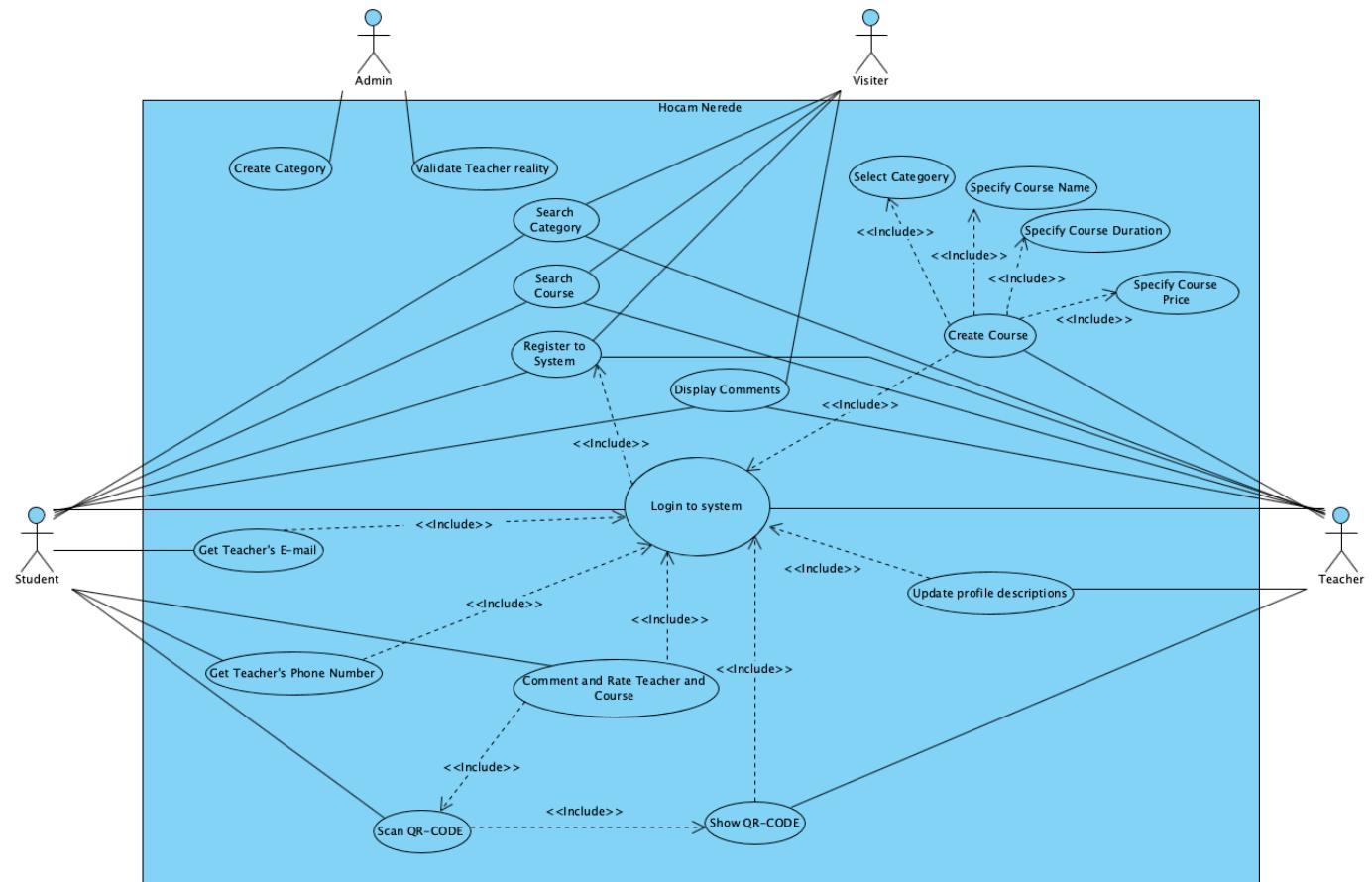


Figure 14 – Use Case Diagram

## 6 HUMAN INTERFACE DESIGN

### 6.1 Mobile Home Page for Mobile Application

The Hocam Nerede mobile app starts. First time you access the mobile app, homepage user is welcome.

Once the student reaches homepage successfully, student encounters some group of items. The student has seven choices.

1. Search bar
2. Popular Teacher
3. All of the teachers
4. Popular Course
5. All of the courses
6. Top categories
7. All categories

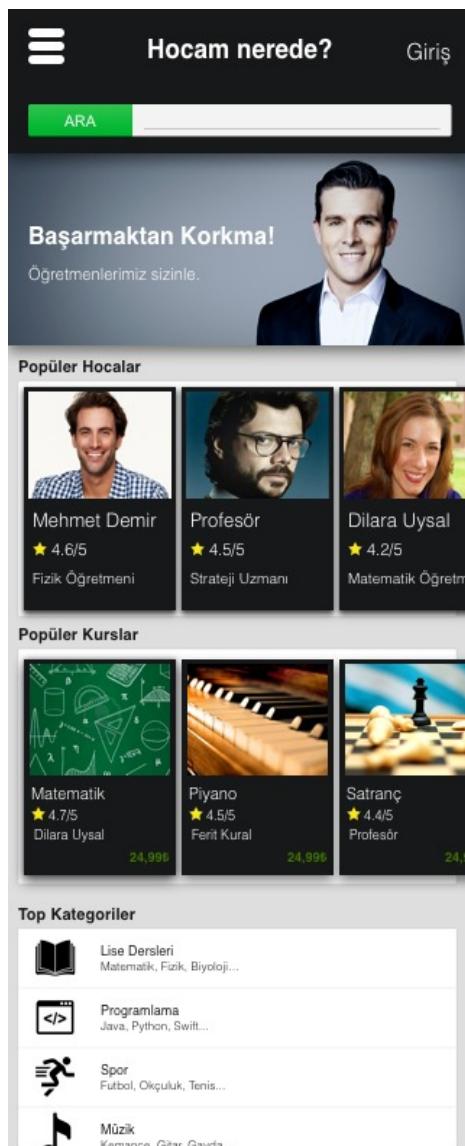


Figure 15 - Home Page for Mobile Application

## 6.2 Search Screen for Mobile Application

Once the user chooses “Search Bar” option, the following window will be displayed. This page allows the user to select:

1. Filter By
2. Order By

Also shows recent searches and suggested teachers. And they can clear their searches with “Geçmiş Sil” button.

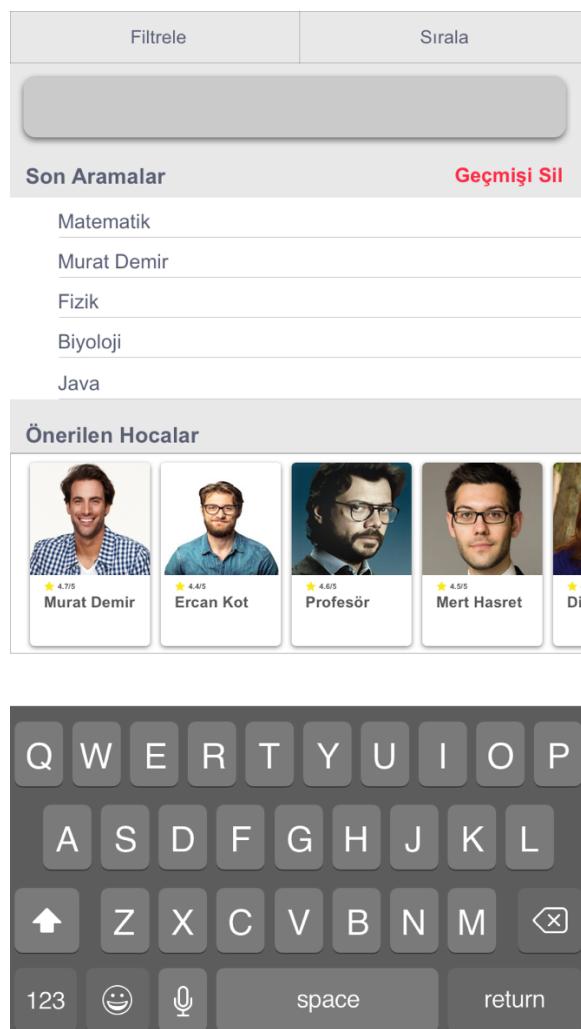
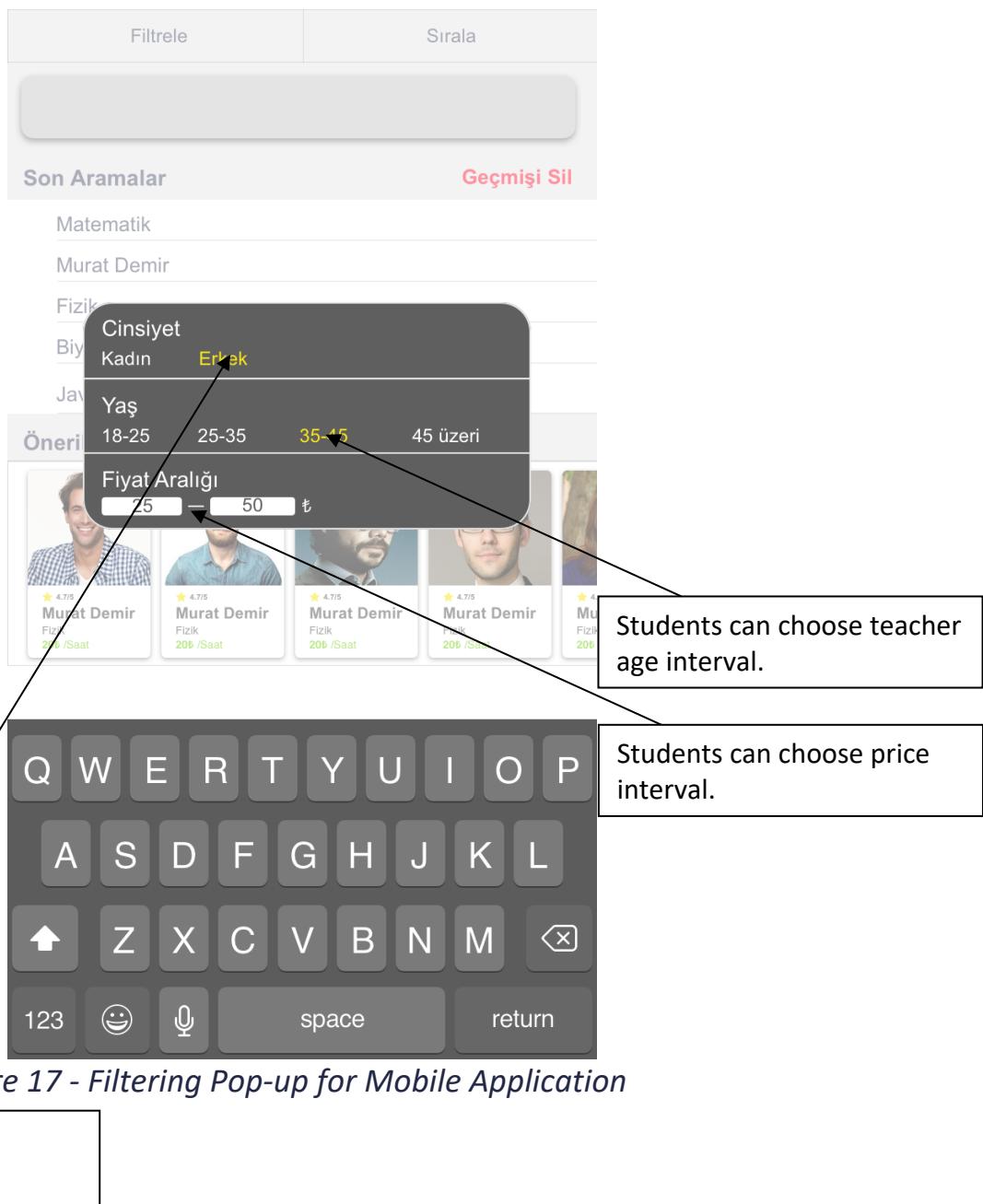


Figure 16-Search Screen for Mobile Application

### 6.3 Filter Pop-up Screen for Mobile Application

If they want to filter their searches, they can touch to “filter by” button. The following dialog will be displayed. This dialog has three filter option.



## 6.4 Teacher Profile Screen for Mobile Application

The user clicks one of the teacher cards in the homescreen, and following window will be displayed. Some of information will be displayed about teacher like teacher average point, e-mail address, phone number, job, age, city, and last seen. Also, teacher can write him/her description to description section. Teacher profile screen allows the students to see courses that the teacher teaches and comments.

The screenshot displays the teacher profile for Murat Demir. At the top, there is a circular profile picture of a smiling man, followed by his name "Murat Demir" and a yellow star rating of "4.7/5". Below this, there are two buttons: "E-posta" and "Ara". The profile information is listed in a table:

	Meslek	Fizik Öğretmeni
	Yaş	28
	Cinsiyet	Erkek
	Şehir	Aydın
	Son Görülme	3 Saat Önce

**Açıklama**  
Lorem Ipsum, dizgi ve baskı endüstrisinde kullanılan mıgır metinlerdir. Lorem Ipsum, adı bilinmeyen bir matbaacının bir hurufat numune kitabı oluşturmak üzere bir yazı galerisini alarak karıştırdığı 1500'lardan beri endüstri standartı sahte metinler olarak kullanılmıştır.

**Verdiği Dersler**

 ★ 4.7/5 Murat Demir Fizik 20₺ /Saat	 ★ 2.2/5 Murat Demir Piyano 50₺ /Saat
--	---

**Yorumlar**

Harun Tekin ★ 5/5 Fizik Birlikte çalışması çok kolay...	Nazlı Kısa ★ 5/5 Fizik Herkese tavsiye ediyorum	Kemal Balık ★ 4/5 Fizik Biraz geç kaldığı için 1 puan kırıyorum	Beril Adığuzel ★ 2/5 Piyano Piyano çalışmasını bilmeden ders vermeye başlamış. Yinede biraz biliyor.
---	---	---	--

Figure 18 - Teacher Profile Screen for Mobile Application

## 6.5 Security Login Screen for Mobile Application

If the students touch on “Ara” button in the teacher profile, they need to log in to the system. The following screen is the log in screen.

The students who is the not registered to the system can register to system with “Üye ol” Button.

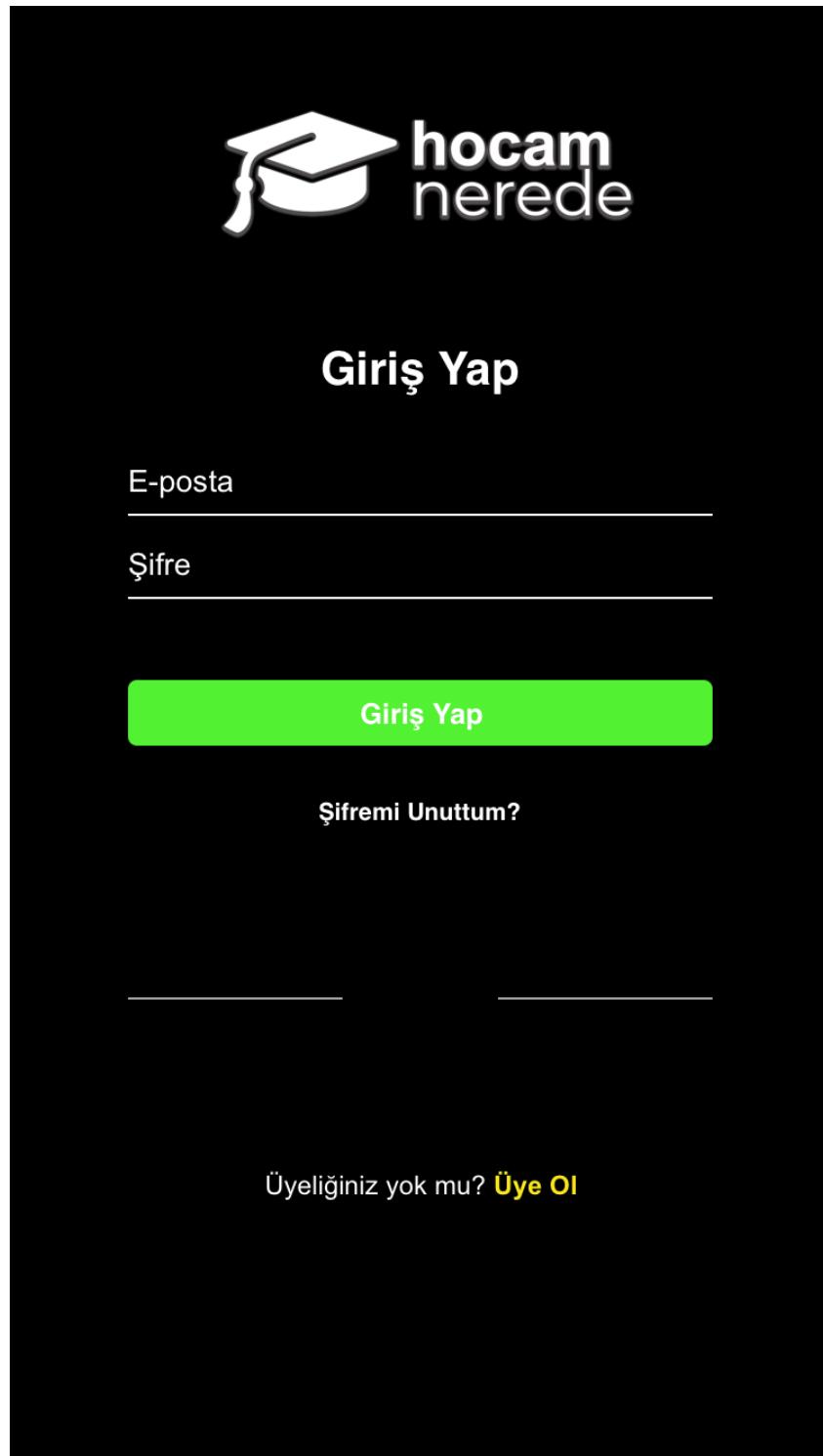


Figure 19 - Security Login Screen for Mobile Application

## 6.6 Register Screen for Mobile Application

The following screen is register screen. The student needs to fill text boxes that is required and select city where is living now.

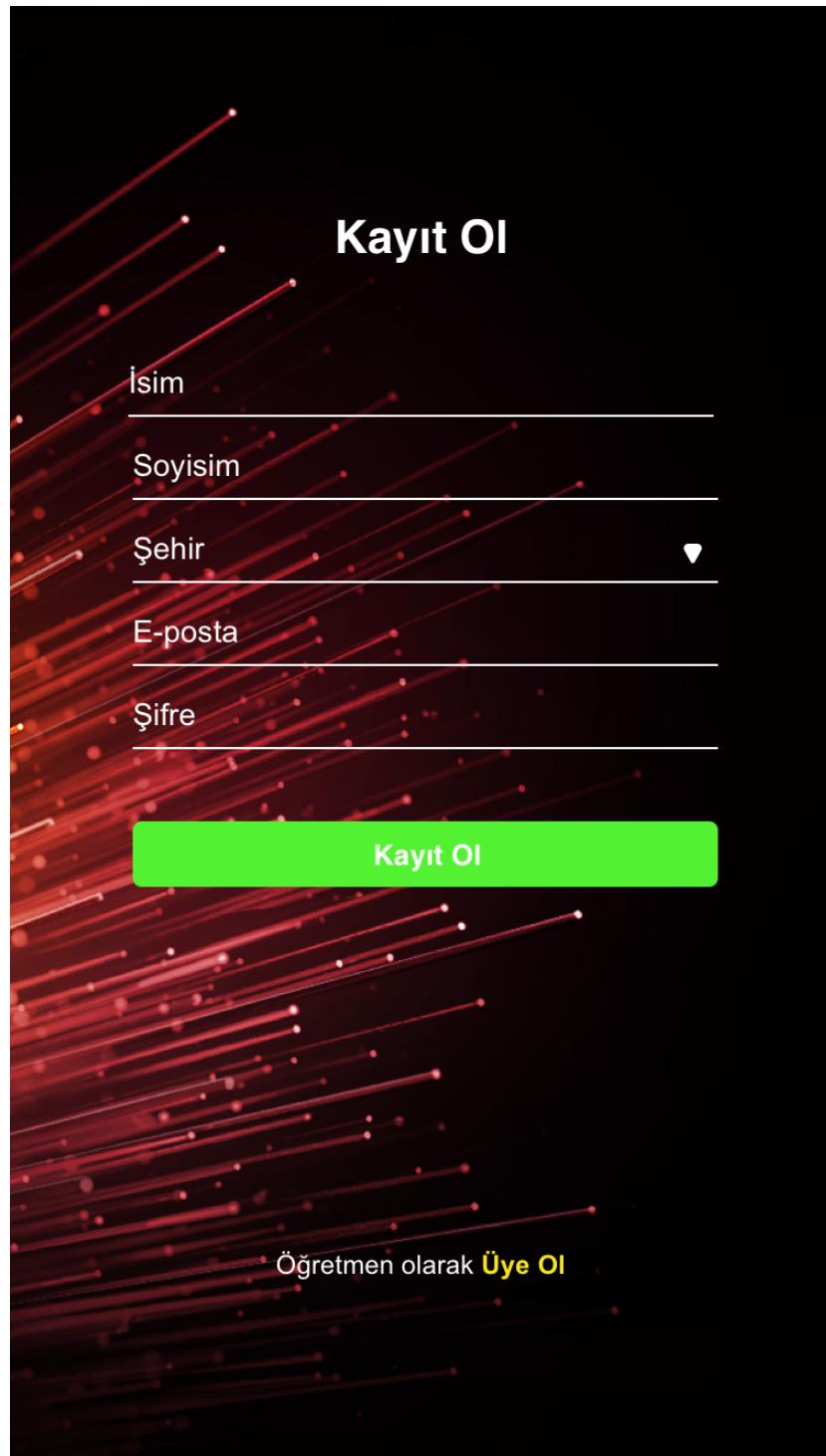


Figure 20 – Register Screen for Mobile Application

Second, displays verification code screen to the students. They must write the verification code that we sent to the written e-mail address. Because we need to validate the users.

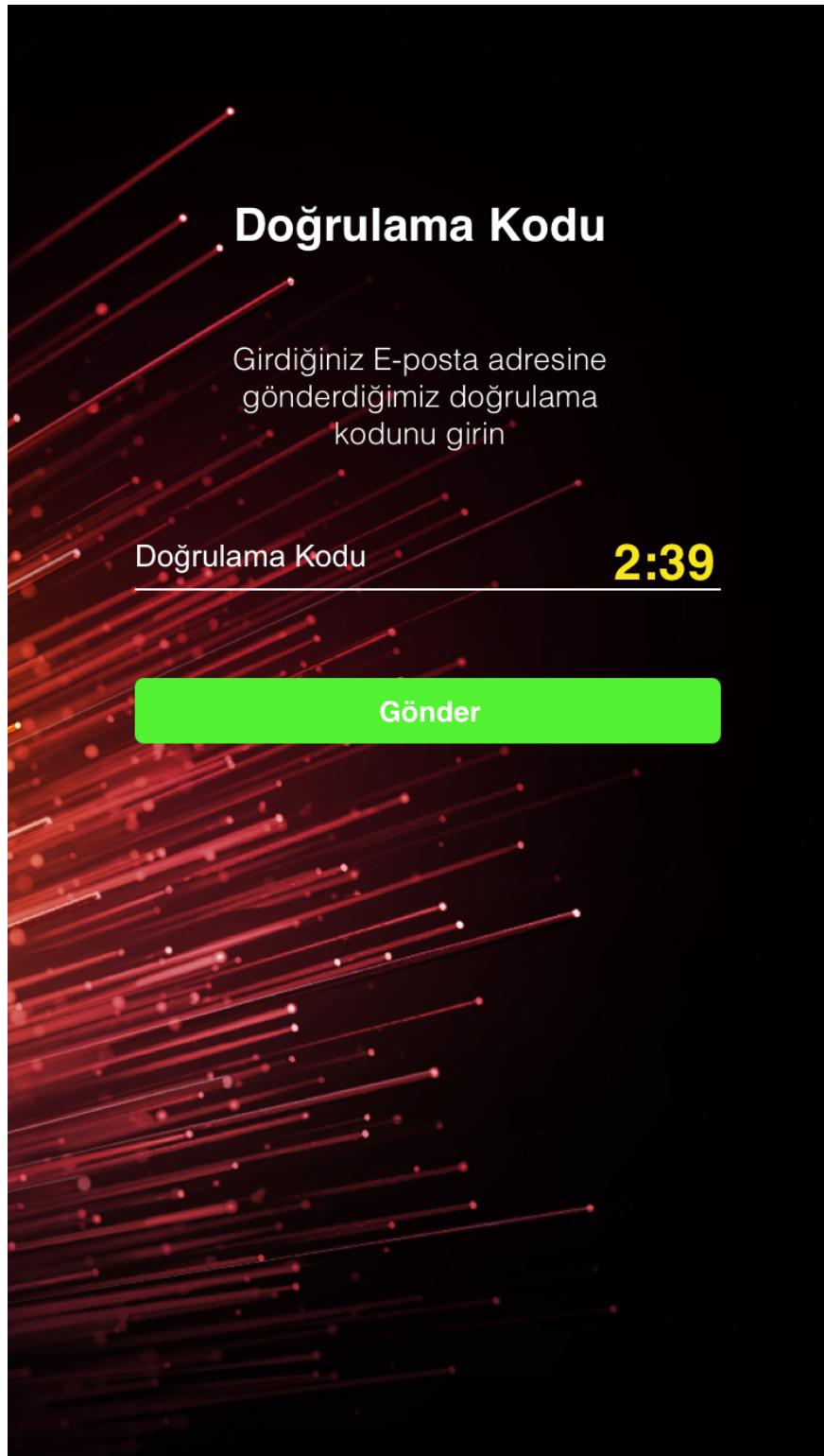


Figure 21 - Verification Code Screen for Mobile Application

## 6.7Category Screen for Mobile Application

By clicking on one of the categories, the following window will be displayed.

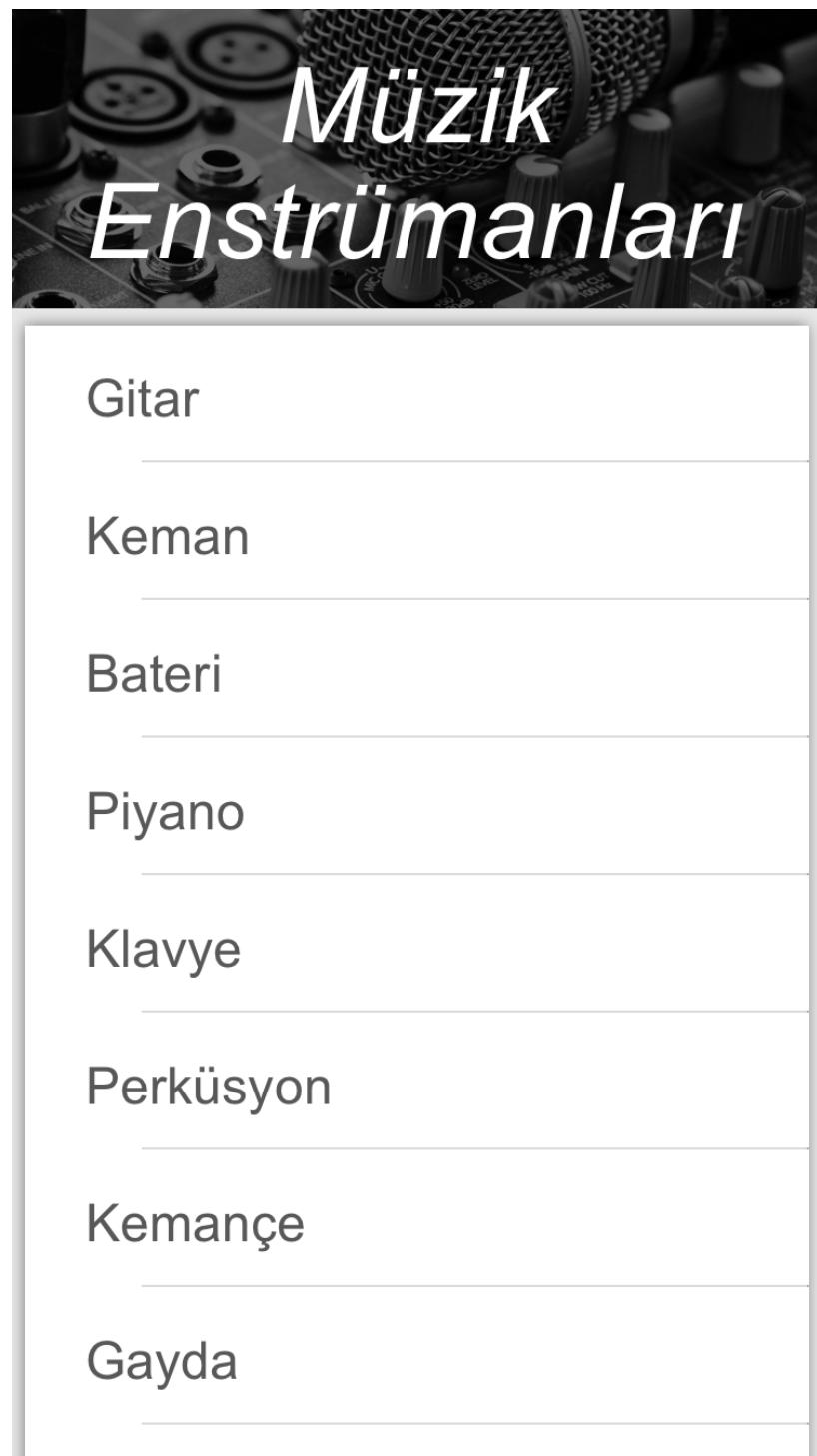


Figure 22 - Category Screen for Mobile Application

## 6.8 Home Page for Web Application

Homepage of the Hocam Nerede Website. Student can access popular teacher, popular courses, top categories, suggested courses. Also, s/he can search courses what s/he interests.



### Önerilen Kurslar



Figure 23 - Home Page for Web Application

## 6.9 Pop-up for Choosing account type for Web Application

Teachers can only register from website of the Hocam Nerede app, Students can choose whatever platform they desire to register.

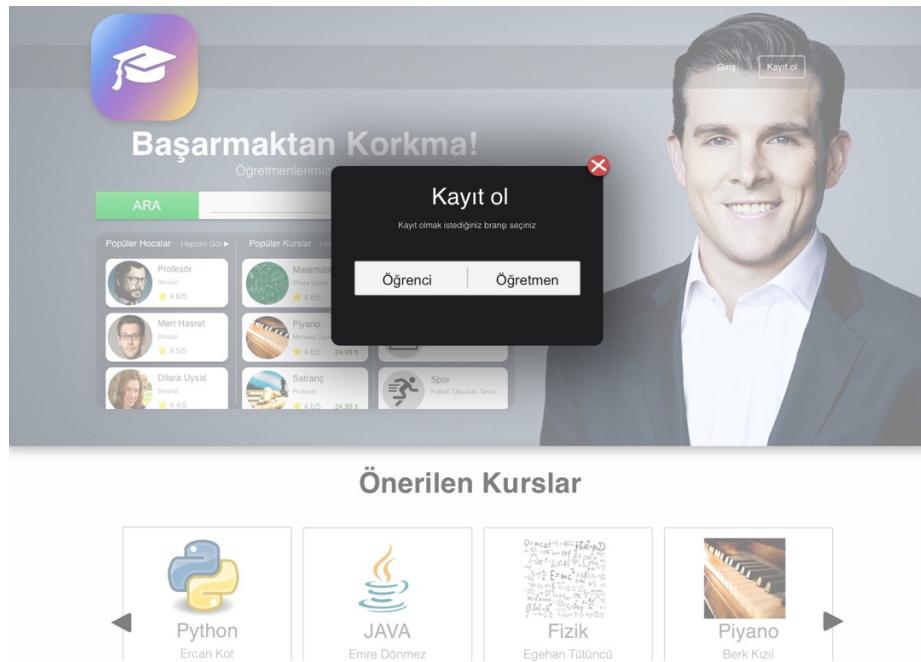


Figure 24 – Pop-up for Choosing account type for Web Application

## 6.10 Registration Screen for Web Application

### Registration Page for teachers:

This page sends an e-mail to our team that include some information and documents about teacher in order to control by us. If the teacher accepted by us, we will confirm teacher profile to register to system.

The registration screen features a background image of a snow-capped mountain peak under a cloudy sky. At the top left is a logo consisting of a graduation cap icon inside a square frame with a purple-to-yellow gradient. Below the logo, the text "Kayıt ol" is displayed in a bold, black font. Underneath this, the URL "hocamnerede > kayıt ol" is shown. The main form area is titled "E-posta ile kayıt ol". It contains six input fields labeled "E-posta", "Şifre", "İsim", "Soyad", "Doğum tarihi", and "Meslek". Each label is followed by a text input field. Below these fields is a section labeled "Belge" with the sub-instruction "(CV,Lisans,Öğrenci belgesi...)" and a button labeled "dosya seç".

*Figure 25 - Registration Screen for Web Application*

## 6.11 Login Screen for Web Application

Website login Page:



Figure 26 - Login Page for Web Application

## 7 TESTING

### Functionality Test:

- Selenium

### Performance Test:

- Load Test
- Stress Test

## 8 SYSTEM DEVELOPMENT ENVIRONMENT

### 8.1 Hardware Environment

- Intel Core i7 Processor
- 1TB HDD + 250 GB SSD
- 16GB RAM
- NVIDIA GT 720 GPU
- AMD RADEON PRO 555 GPU

### 8.2 Software Environment

#### 8.2.1 Development Tools

- Visual Studio IDE
- Visual Studio Code IDE
- Atom IDE
- Android Studio for an android device emulator
- XCode for an IOS device emulator
- File Zilla
- Termius SSH Client

#### 8.2.2 Programming Languages

- PHP
- React Native
- .NET Core
- C#

#### 8.2.3 Database

Mysql shall be used as the system's database management system.

#### 8.2.4 Operating Systems

- Windows 10 and Windows 8.1
- Mac OS Mojave

## 9 TIMELINE

We are planning implementation web API between January 20 and January 31, web and mobile application will be started at February 1 and will be finished at May 7,

After finish implementation, we are testing applications.

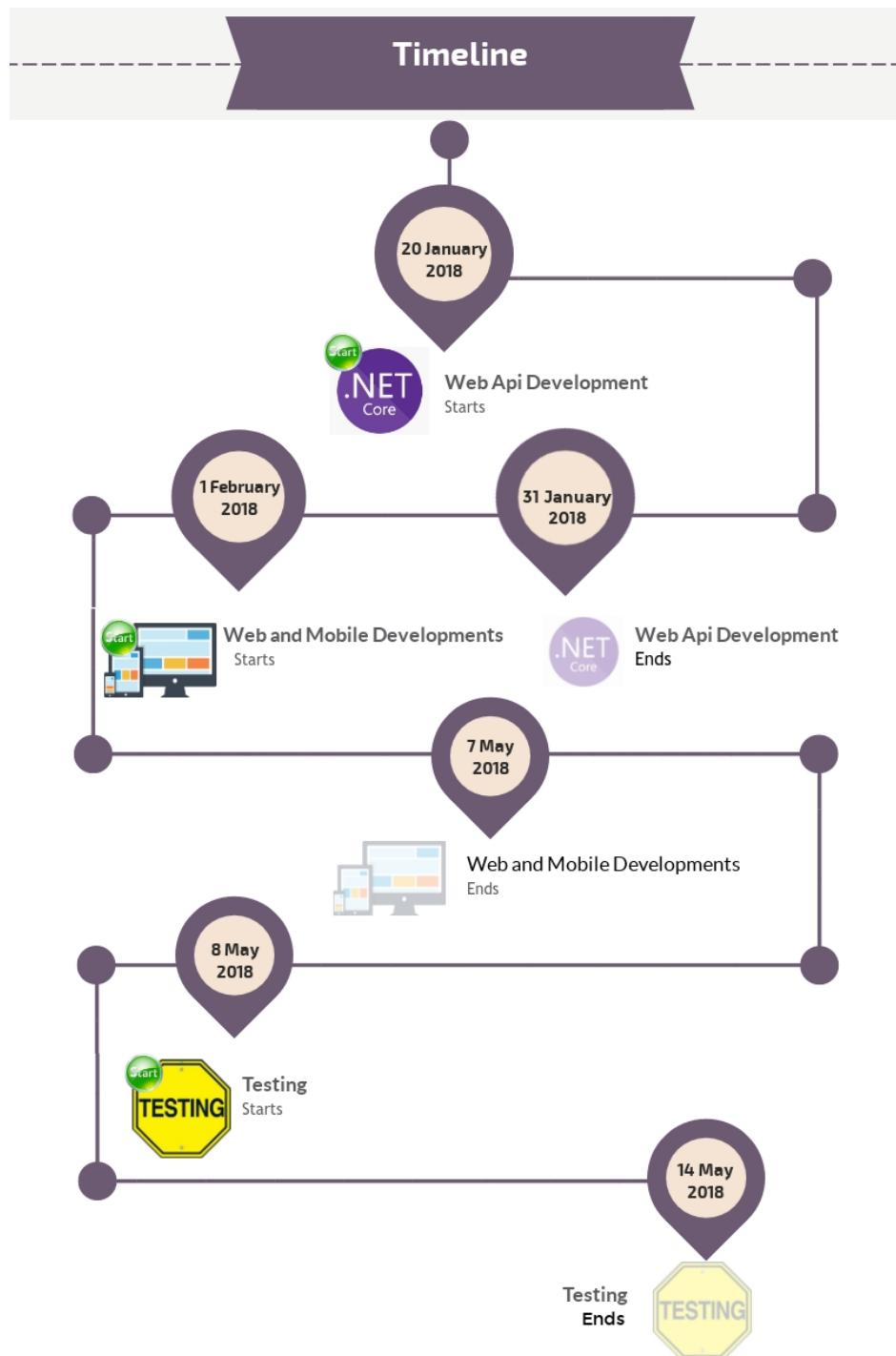


Figure 27 - Timeline