UML Class Diagram
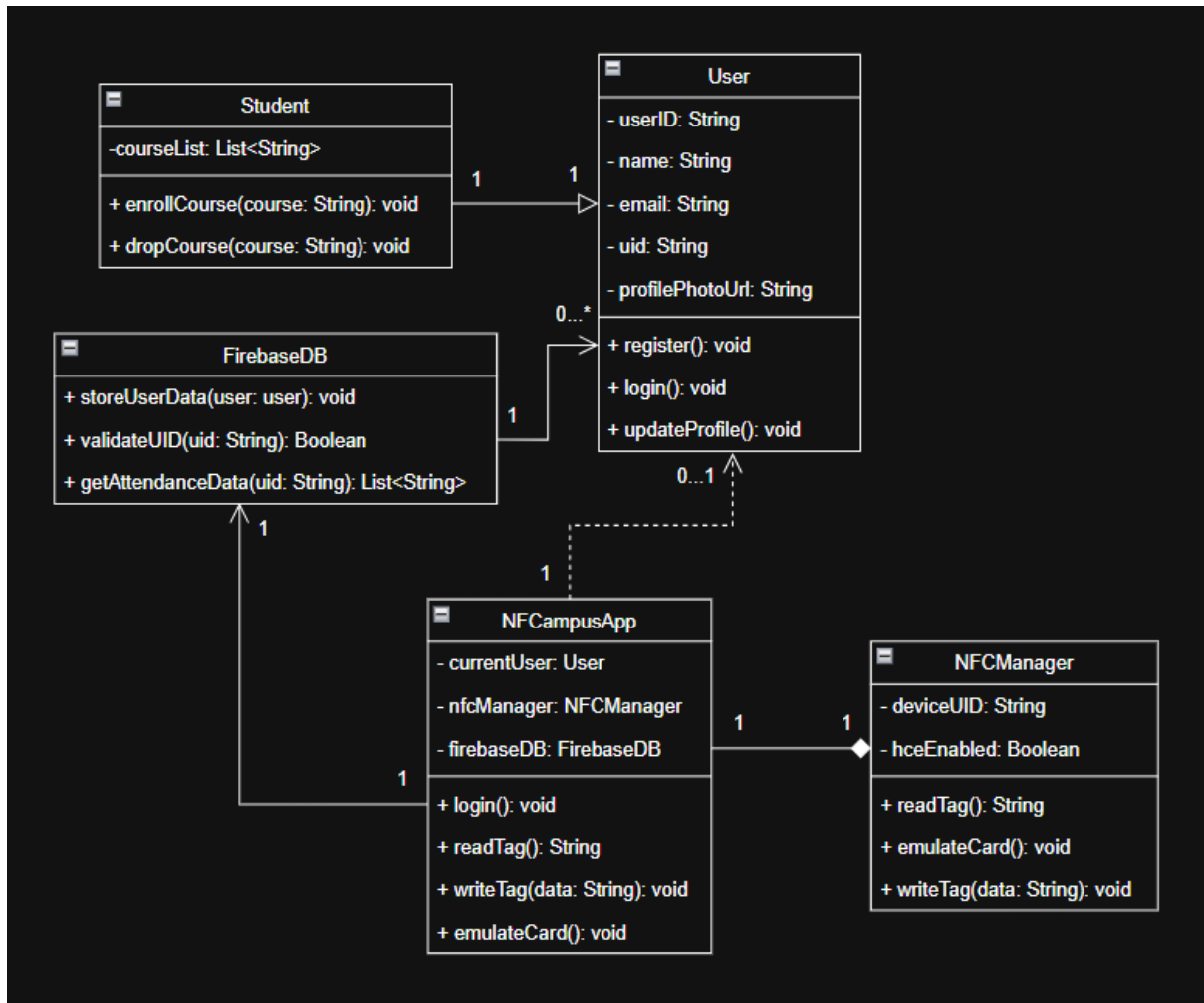

1. User Class (Main Parent Class)

This is the main **User** class. It holds all essential user attributes such as userID, name, email, UID, and profile photo.
It also contains the core functions:

- **register()**

- **login()**

- **updateProfile()**

---

2. Student Subclass

The **Student** class inherits from User.

It adds a **courseList**, which stores the subjects the student is enrolled in.

This keeps student-specific data separated from general user attributes.

---

3. NFCManager Class

The **NFCManager** class handles all NFC-related functionality.

It stores the phone's UID and the HCE service status.

It provides operations such as:

- **readTag()**

- **emulateCard()**

This is the component responsible for turning the phone into a campus access card.

---

4. NFCampusApp Class

This represents the main **mobile application** layer.

It interacts with the User class and the NFCManager class.

It stores the currently logged-in user and provides:

- **readTag()**

- **writeTag()**

- **emulateCard()**

This is the central control point for user actions on the app.

---

5. FirebaseDB Class (Backend Database)

Finally, the **FirebaseDB** class represents our backend cloud database.
It stores:

- user records

- access logs

And provides functions like:

- **storeUserData()**

- **validateUID()**

- **getAttendanceData()**

This sequence diagram explains how the NFCampus system handles registration, MFA-based login, NFC access verification, and admin account management. It shows the interaction between the User, Mobile App, Firebase backend, the NFC Reader, and the Admin panel.