

REPUBLIC OF CAMEROON
Peace-Work-Fatherland
MINISTER OF HIGHER EDUCATION
FACULTY OF ENGINEERING
AND TECHNOLOGY



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SUPERIEUR
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ET TECHGNOLOGIE

FACULTY OF ENGINEERING AND TECHNOLOGY
Department : Computer Engineering

**CEF 440: Internet Programming and Mobile
programming**
TASK 5
UI DESIGN AND IMPLEMENTATION

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1. INTRODUCTION

In today's educational environment, ensuring accurate and efficient attendance tracking is a critical component for both administrative operations and academic integrity. Traditional methods of attendance tracking such as manual roll-calling or paper-based sign-in sheets are prone to errors, inefficiencies, and potential manipulation. To address these issues, a Biometric Student Attendance System offers a robust solution by leveraging biometric technology to automate and secure the process of student attendance recording.

To address these issues and usher in a new era of efficient attendance tracking, this report presents the UI design and implementation of a biometric student attendance mobile application. The primary objective of this system is to enhance the reliability and efficiency of attendance tracking through the use of biometric authentication methods such as fingerprint. By implementing such a system, educational institutions can achieve a higher level of accuracy in attendance records, reduce administrative burdens, and enhance overall security.

1.1. UI Design Definition

User interface (UI) design is the process designers use to build interfaces in software or computerized devices, focusing on looks or style. Designers aim to create interfaces which users find easy to use and pleasurable. UI design refers to graphical user interfaces and other forms—e.g., voice-controlled interfaces, graphic user interface.

To design UIs best, you should consider:

- i. **Users judge designs quickly and care about usability and likeability**
 - They don't care about your design, but about getting their tasks done easily and with minimum effort.
 - Your design should therefore be "invisible": Users shouldn't focus on it but on completing tasks: e.g., ordering pizza on Domino's Zero Click app.
 - So, understand your users' contexts and task flows (which you can find from, e.g., customer journey maps), to fine-tune the best, most intuitive UIs that deliver seamless experiences.
- ii. **UIs should also be enjoyable (or at least satisfying and frustration-free).**
 - When your design predicts users' needs, they can enjoy more personalized and immersive experiences. Delight them, and they'll keep returning.
 - Where appropriate, elements of gamification can make your design more fun.
- iii. **UIs should communicate brand values and reinforce users' trust.**

- Good design is emotional design. Users' associate good feelings with brands that speak to them at all levels and keep the magic of pleasurable, seamless experiences alive.

1.2. Designs Principles

The UI design of the mobile application is guided by the following essential principles:

- **Simplicity and Clarity:** The interface should be clean, minimalist, and easy to navigate. This is achieved by removing unnecessary elements and visual elements throughout the app, and implementing intuitive navigation patterns.
- **Responsiveness:** The UI should adapt seamlessly to different screen sizes and orientations. This is achieved by employing responsive design techniques such as adaptive layouts and flexible grids.
- **Feedback and Response:** The UI should provide visual feedback and loading indicators to reassure users that their actions have been registered in other word provide immediate feedback for user actions. . This is achieved by incorporating micro interactions like animations, color changes, or haptic feedback.
- **Aesthetics:** Creating visually appealing designs that enhance user satisfaction and engagement.
- **Consistency:** Providing a uniform look and feel across the application to enhance familiarity and ease of use.

2. UI Design Process

To create a successful biometric student attendance mobile app, we followed a design process that involved research, wireframing, and prototyping.

2.1. Research and Requirement Gathering

- **User Personas:** We began by researching out to our target audience that's our primary users and their specific needs.
- **Stakeholder interviews:** We conducted interviews with our key stakeholders that is students, lecturers and administrators to understand their pain points and their expectation in this biometric student attendance app.
- **Competitive Analysis:** We also conducted competitive research to see what other biometric student attendance apps were available in the market and what features they offered.

2.2. Low- Fidelity Sketches

After conducting research, we created low –fidelity sketch to map out the user flow and the app's layout. The low-fidelity sketch allowed us to visualize the app's structure and ensure that the user flow was intuitive.

o Key screens designed include:

- **Login screens:** Login screen for both student and instructor for user authentication.
- **Registration screen:** Mark the beginning of the student on-boarding process and sets the tone for the overall user experience.
- **Home Screen:** Home screen designed to be a dashboard that provide quick access to the most important features of the system.
- **Attendance Making Screen:** Interface for recording attendance.
- **Fingerprint Enrollment Screen:** Interface to enroll student fingerprint.
- **Attendance reports Screen:** Viewing and exporting attendance reports.

Low fidelity sketch of the student interface we did

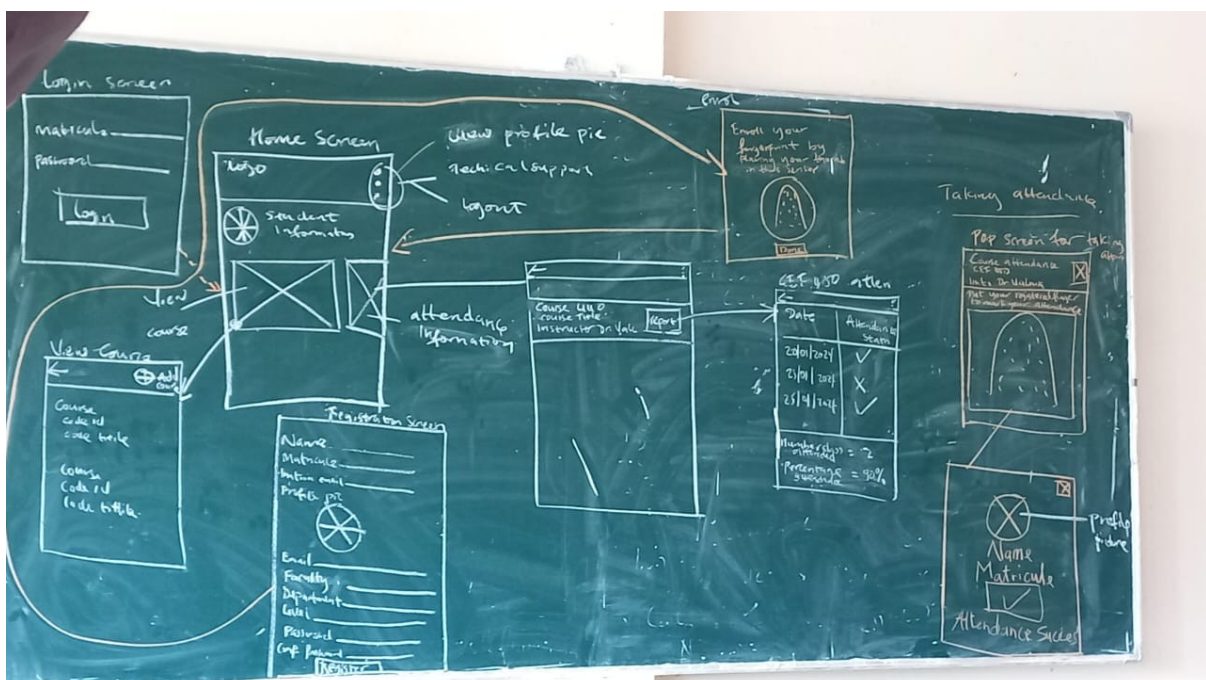


Figure 1: student interface low-fidelity prototype

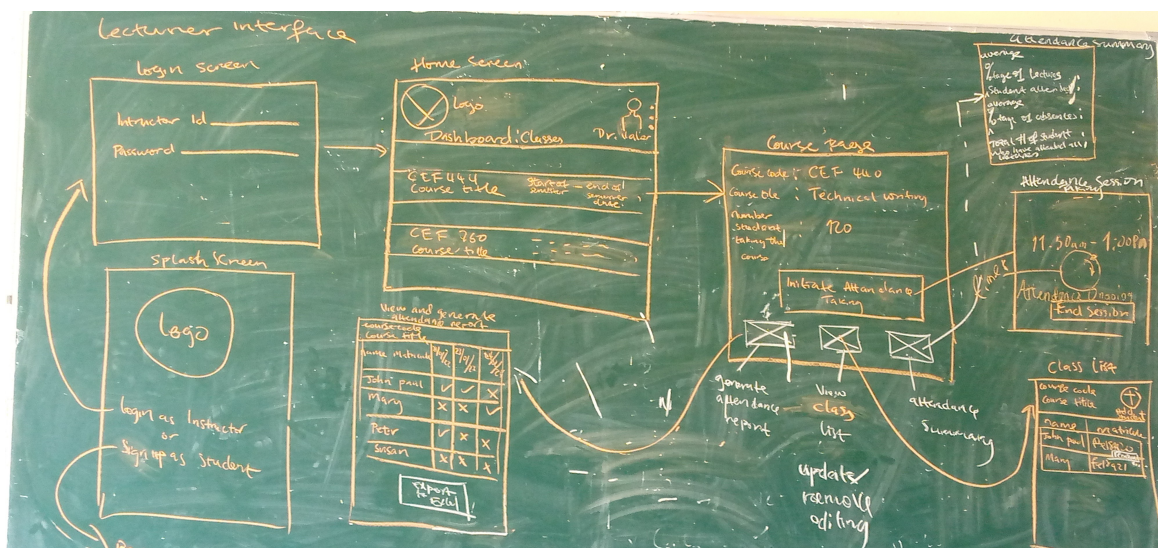


Figure 2: lecturer interface low-fidelity prototype

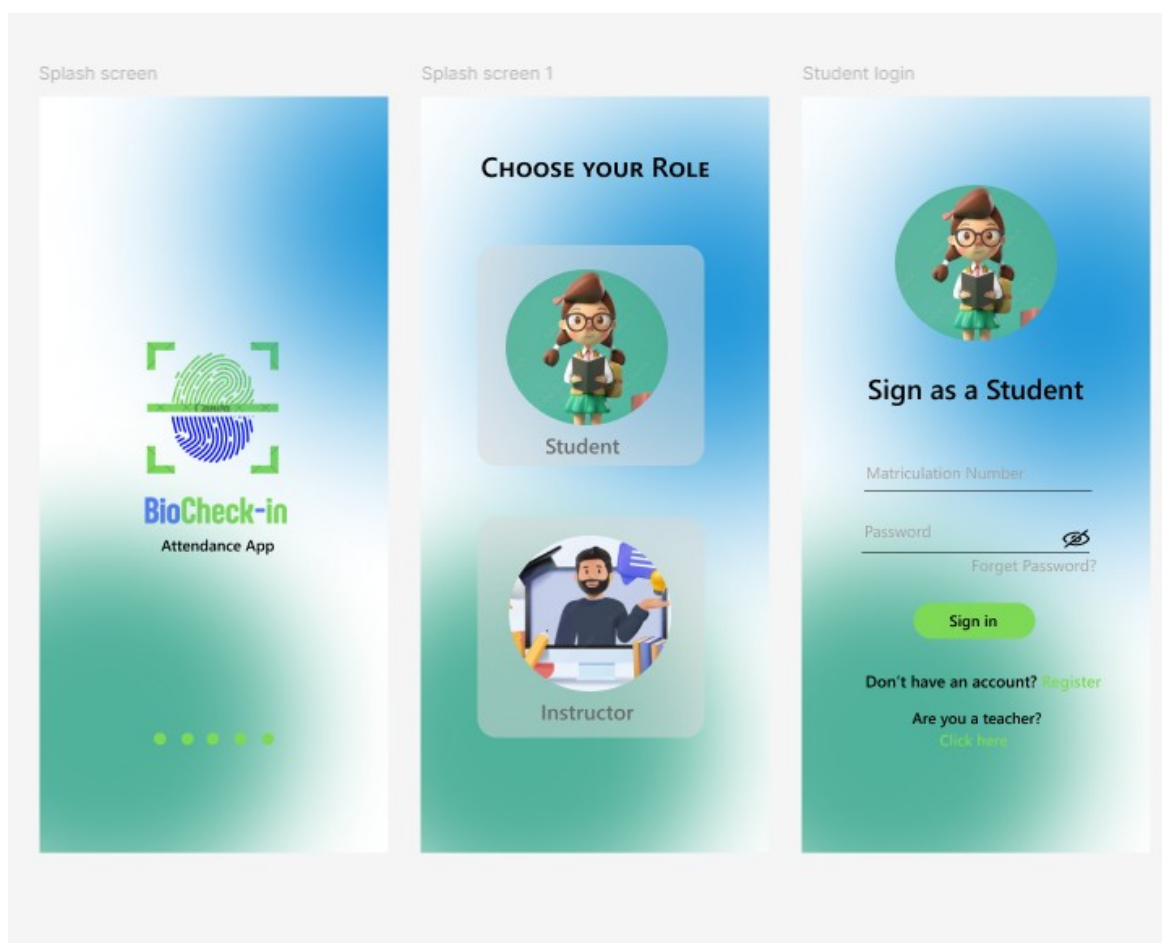
2.3. Prototyping

With the wireframes finalized, we developed high-fidelity interactive prototypes using Figma, a collaborative design tool. The prototype allowed us to test the user flow and user interface design. This is the prototype link: [CLICK HERE](#)

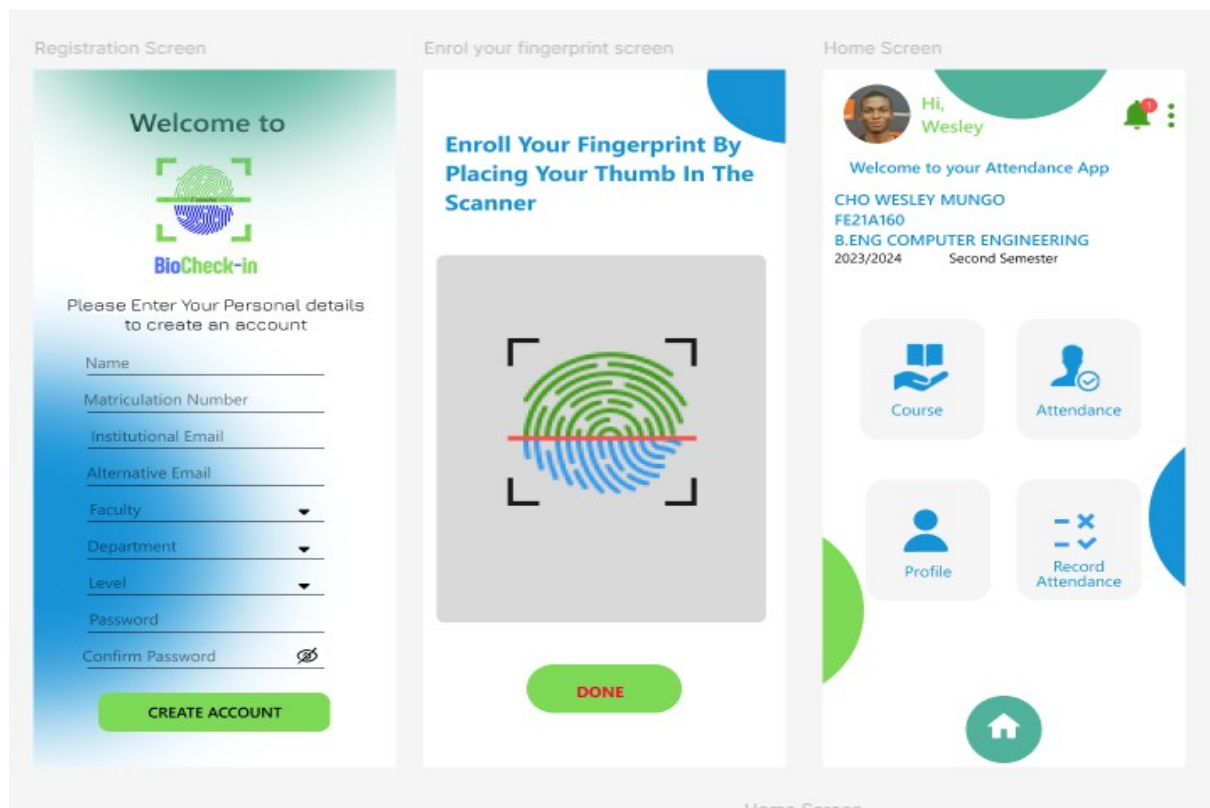
2.4. Key UI components

2.4.1. Student Interface UI Design

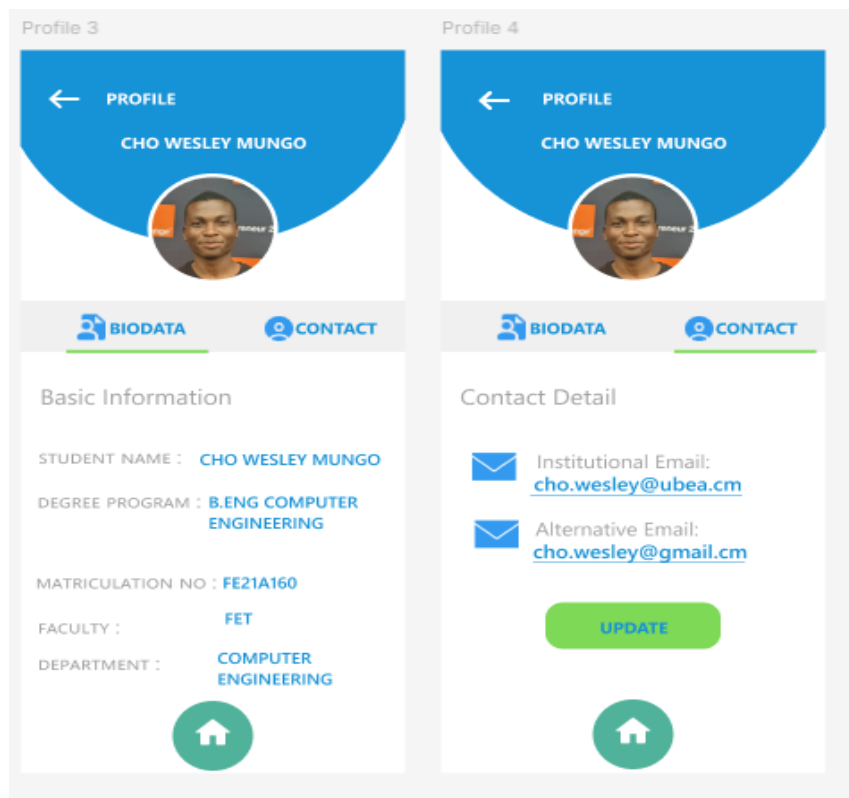
- Splash , Role Screen and Student login page



➤ Registration Screen, Fingerprint Enrollment Screen and Home Screen



➤ Profile Screens



➤ Course and Add Screen

Course Screen

← COURSE

+

Add Course

COURSES ENROL IN

Course Code: CEF 482
Course Title: XML AND DOCUMENT CONTENT
VALIDATION
Credit Value: 3
Course Satatus : C

Course Code: CEF 472
Course Title: HUMAN COMPUTER INTERFACE
Credit Value: 3
Course Satatus : C

Course Code: CEF 472
Course Title: HUMAN COMPUTER INTERFACE
Credit Value: 3
Course Satatus : C

Course Code: CEF 472
Course Title: HUMAN COMPUTER INTERFACE
Credit Value: 3
Course Satatus : C

↑

Add course Screen

← ADD COURSE

Select Level
Level 300

Select Semester
Second Semester

Course Code: CEF 364
Course Title: LOCAL AREA NETWORKS
Credit Value: 3
Course Satatus : C

ADD

Course Code: CEF 364
Course Title: LOCAL AREA NETWORKS
Credit Value: 3
Course Satatus : C

ADD

Course Code: CEF 364
Course Title: LOCAL AREA NETWORKS
Credit Value: 3
Course Satatus : C

ADD

➤ Attendance and Attendance info Screen


← ATTENDANCE

YOUR ATTENDANCE TRACKING HISTORY PER INDIVIDUAL COURSE

CEF 482

15-10-2023 To 06-08-2024

Incharge: DR SOP LIONEL




Attendance Info

CEF 440

15-10-2023 To 06-08-2024

Incharge: DR VALERIE




Attendance Info

CEF 472

15-10-2023 To 06-08-2024

Incharge: DR INES




Attendance Info

CEF 482

15-10-2023 To 06-08-2024


Incharge: DR SOP LIONEL



Attendance Info

← CEF 482 Attendance info

YOUR ATTENDANCE INFORMATION OF THE COURSE CEF 482



CHO WESLEY MUNGO

FE21A160

< 1st, OCTOBER 2024 >

SUN	MON	TUE	WED	THU	FRI	SAT
29	30	1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	24	25	26	27
28	29	30	31	1	2	3

● PRESENT

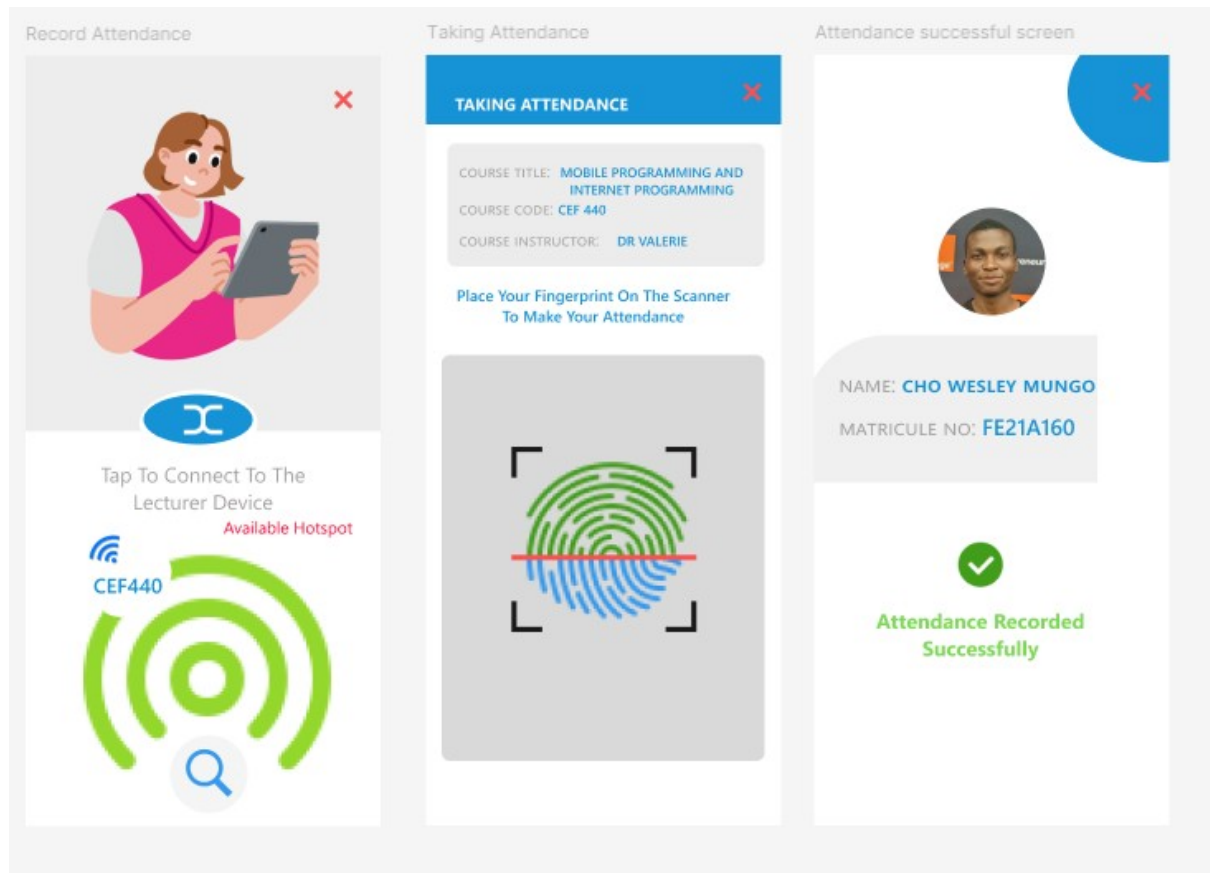
● ABSENCE

● HOLIDAYS

ATTENDANCE SUMMARY

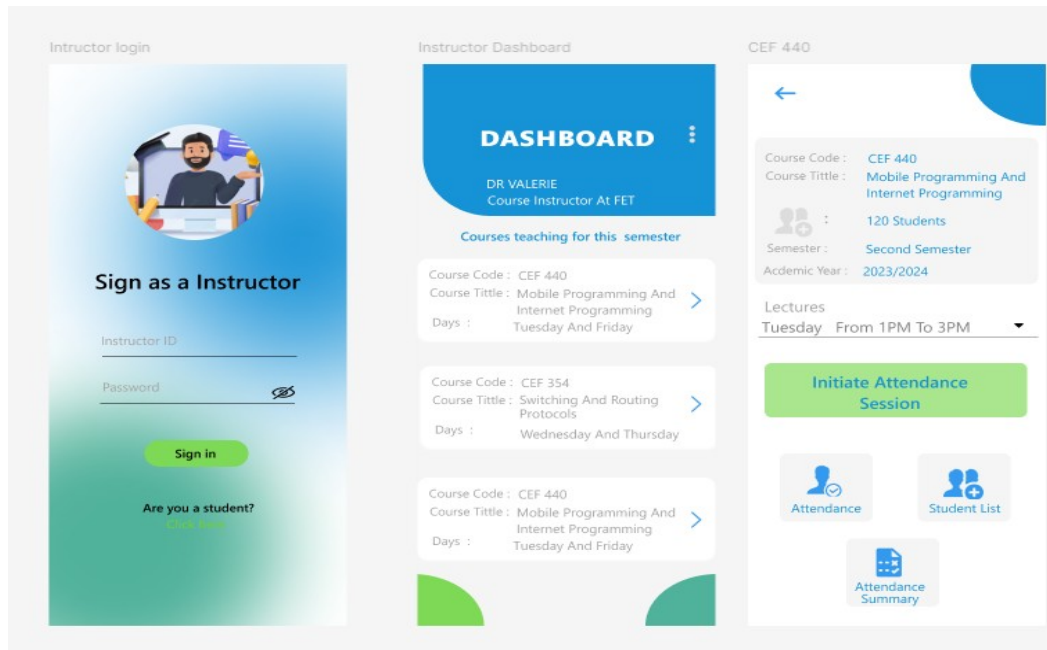
Total Class Days

➤ Record Attendance Screens

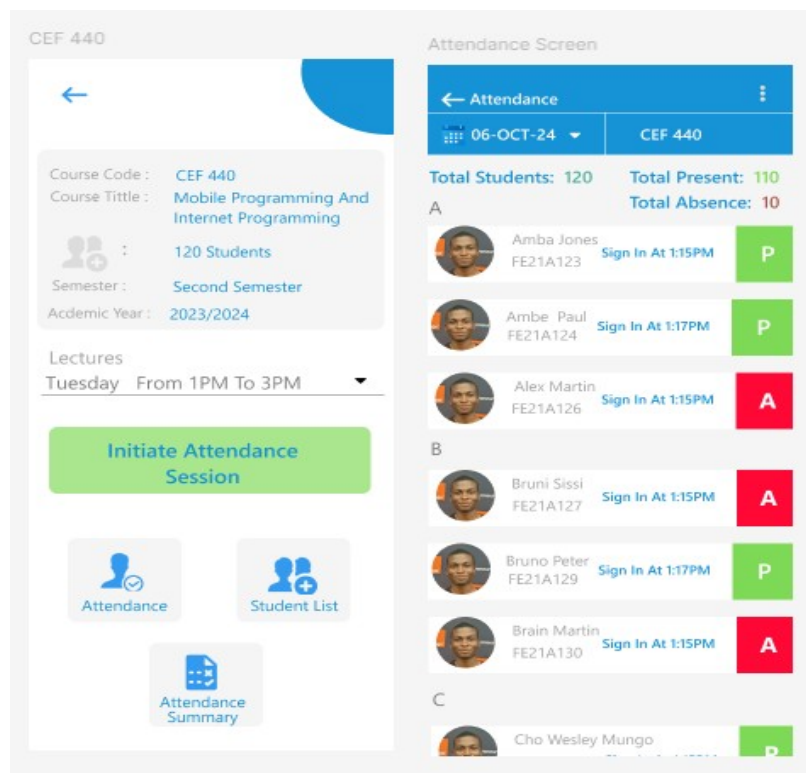


2.4.2. Instructor Interface UI design

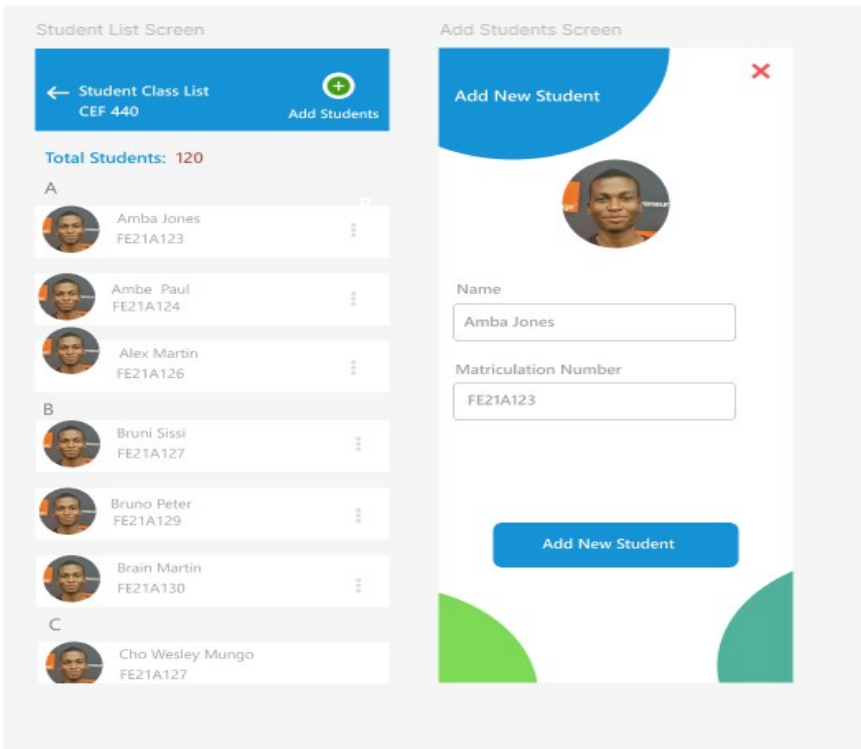
- Instructor login, Instructor Dashboard and Course Screen



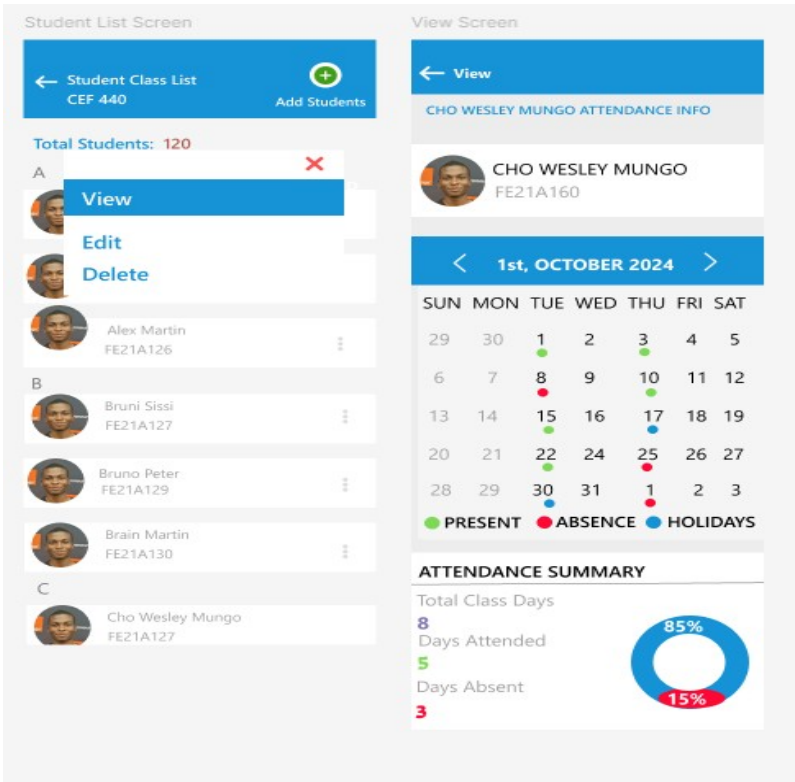
- Course Screen and Attendance Screen



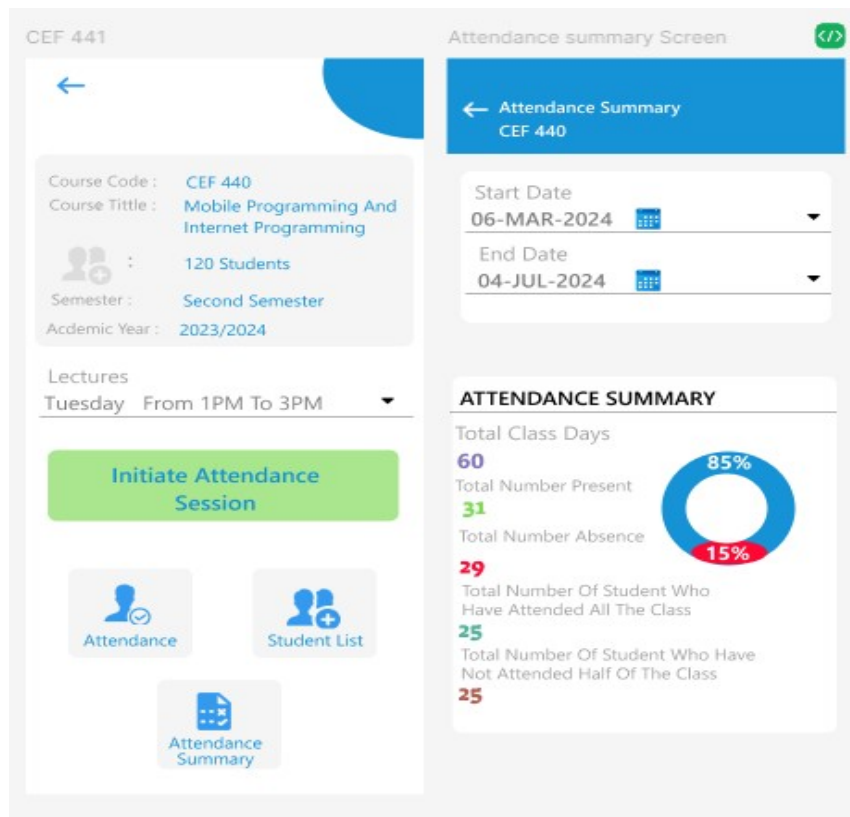
➤ Student list and Add New Student Screen



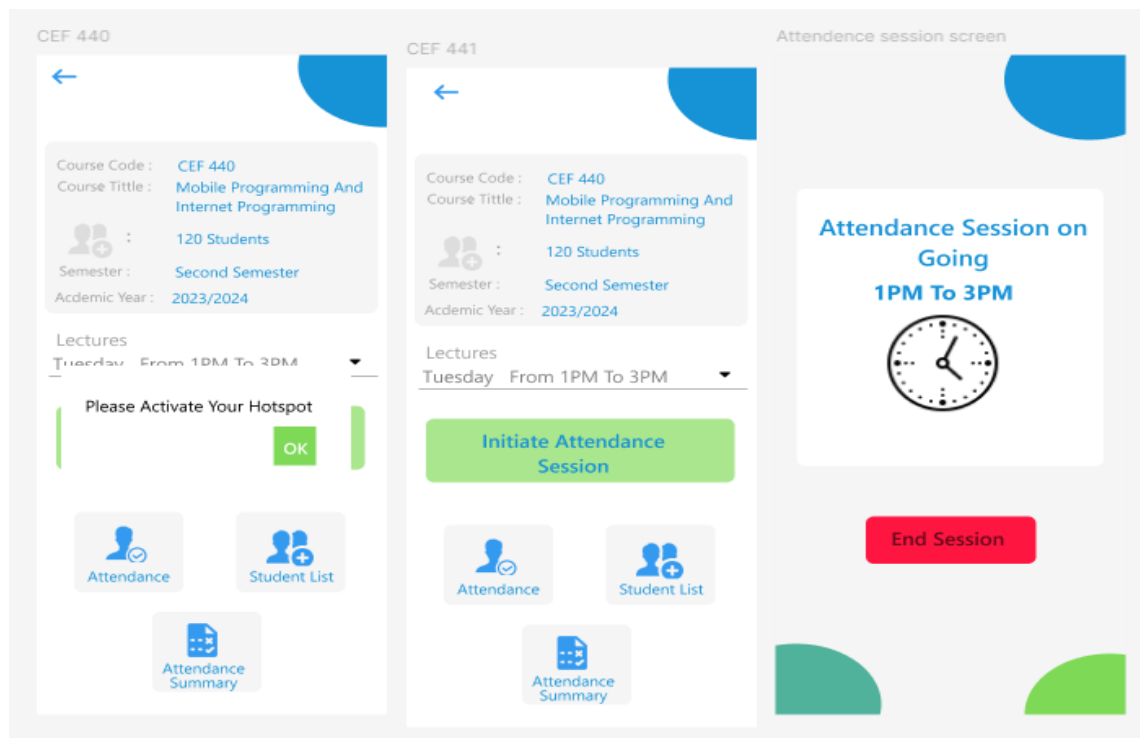
➤ Pop up Screen and View Student Personalize Attendance information



➤ Course Screen And Attendance Summary Screen

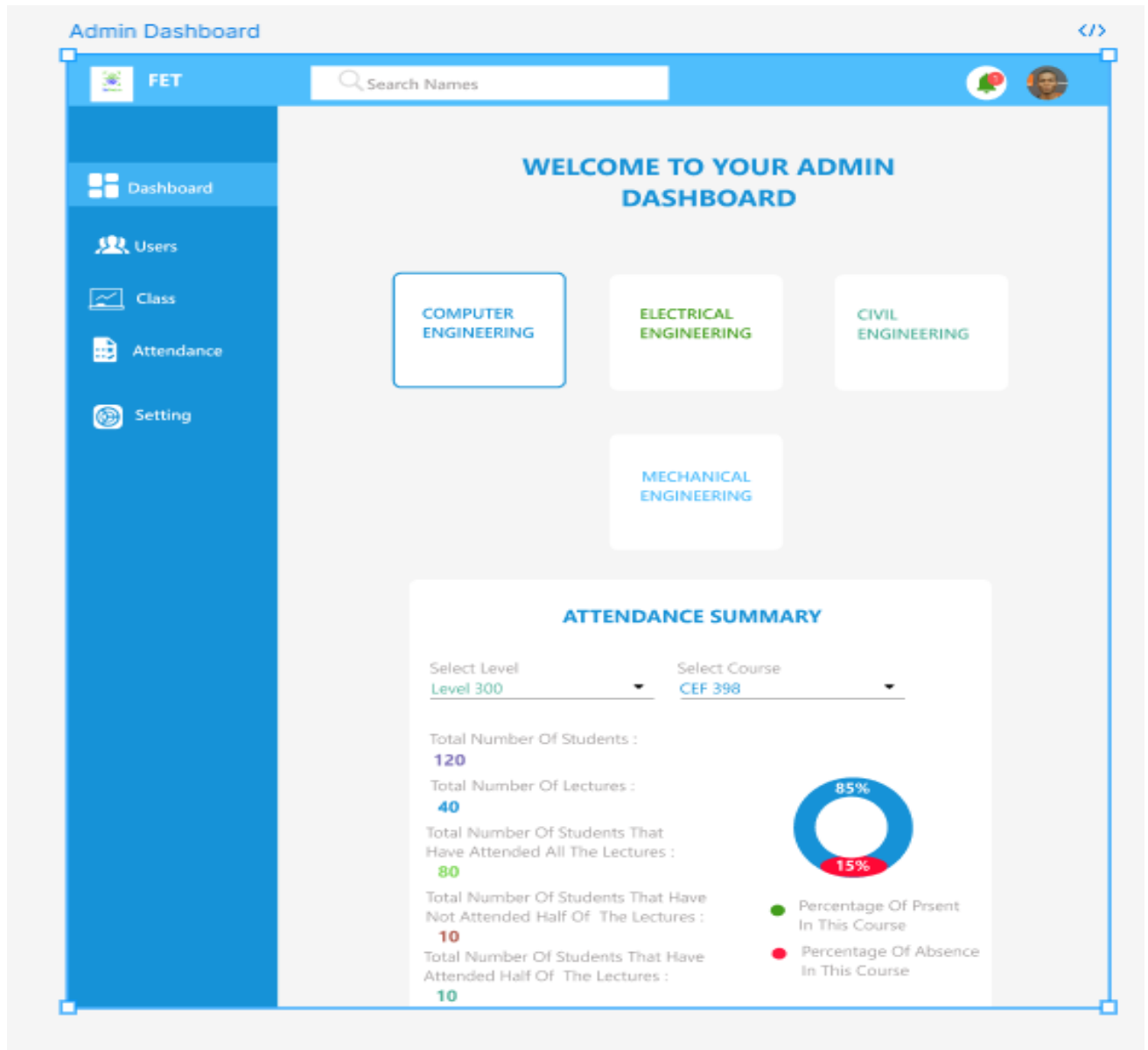


➤ Course Screen and Attendance Session Screen



2.4.3. Administrator UI design Interface

➤ Administrators Dashboard





➤ User Management Screen (Student)

Users management

FET

Search Names



Dashboard

Users

Class

Attendance

Setting


USERS MANAGEMENT



























STUDENTS

LECTURERS

Select Department
Computer Engineering

Select Level
Level 300


Add Student

Student Names	Matriculation Number	Student Email
 Adamu Njoya	FE21A123	adamunjoya@gmail.com 
 Bih Solange	FE21A124	bihsolange@gmail.com 
 Christ Peter	FE21A126	christpeter56@gmail.com 
 Adamu Njoya	FE21A123	adamunjoya@gmail.com 
 Adamu Njoya	FE21A123	adamunjoya@gmail.com 
 Adamu Njoya	FE21A123	adamunjoya@gmail.com 
 Adamu Njoya	FE21A123	adamunjoya@gmail.com 
 Adamu Njoya	FE21A123	adamunjoya@gmail.com 
 Adamu Njoya	FE21A123	adamunjoya@gmail.com 
 Adamu Njoya	FE21A123	adamunjoya@gmail.com 
 Adamu Njoya	FE21A123	adamunjoya@gmail.com 
 Adamu Njoya	FE21A123	adamunjoya@gmail.com 
 Adamu Njoya	FE21A123	adamunjoya@gmail.com 

Section 1

ADD NEW STUDENT

Select Department
Computer Engineering

Select Level
Level 300

Student Name

Matriculation Number

Student Email



ADD

➤ User Management Screen (For Lecturers)

Desktop - 3

FET

Search Names



Dashboard

Users

Class

Attendance


Setting













USERS MANAGEMENT

STUDENTS

LECTURERS

Select Department
Computer Engineering


Add Lecturer

Lecturer Names	Instructor ID	Email
 Dr Adamu Njoya	1234	adamunjoya@gmail.com 
 Dr Bih Solange	5678	bihsolange@gmail.com 
 Mr Christ Peter	1450	christpeter56@gmail.com 
 Dr Valerie	3456	adamunjoya@gmail.com 
 Dr Ines	3907	adamunjoya@gmail.com 
 Dr Sop Dikko	2347	adamunjoya@gmail.com 

Section 2

ADD NEW LECTURER

Select Department
Computer Engineering

Lecturer Name

Instructor ID

Email



ADD

➤ Class Management Screen

Desktop - 4

FET

Search Names



Dashboard

Users

Course


Attendance

Setting



COURSE MANAGEMENT

Select Department
Computer Engineering



Select Level
Level 400 SE


Add Course

Course Code: CEF 482
Course Title: XML AND DOCUMENT CONTENT VALIDATION
Credit Value: 3
Course Status: C
Instructor: Dr Sop
Date And Time: Tuesday From 9am To 11am
Friday From 3pm To 5pm



Course Code: CEF 482
Course Title: XML AND DOCUMENT CONTENT VALIDATION
Credit Value: 3
Course Status: C
Instructor: Dr Sop
Date And Time: Tuesday From 9am To 11am
Friday From 3pm To 5pm



Section 3

ADD COURSE

Select Department
Computer Engineering

Select Level
Level 300

Course Code

Course Title

Credit Value

Course Status

Lecturer

Date&Time

ADD

17

➤ Student Attendance Screen

Desktop - 5

FET

Dashboard
Users
Course
Attendance
Setting

STUDENT ATTENDANCE

Select Department
Computer Engineering

Today's Attendance
Previous Day's Attendance
Today's Students : 545

445
Total Present
100
Total Absent

Attendance By Course

Select Level
Level 400 SE

Select Course
CEF 482

Today's Attendance
Previous Day's Attendance
Today's Students : 125

120
Total Present
5
Total Absent

Export

Student Names	Matriculation NO	06/10/24	08/10/24	12/10/24	14/10/24
Adamu Njoya	FE21A123	P	P	P	A
Mary Paul	FE21A125	A	P	P	P
Nary Paul	FE21A125	A	P	P	P
Kary Paul	FE21A125	A	P	A	P
Pary Paul	FE21A125	P	P	P	A

3. UI Implementation

3.1. Technology Stack

- **Frontend Development:** Flutter both for Android and IOS.
- **Design Tools:** Figma for design and prototyping
- **Logo Design Tools:** We used Canva for our logo designing
- **For the Admin Panel/ Dashboard** we are going to Reactjs to code the UI interface

3.2. Development Process

- **Component-Based Architecture:** Designs reusable UI components for consistency and efficiency.
- **Response Design:** Ensure the app adapts to various screen sizes and orientations.

4. Iterative Improvements

- **Usability Enhancements:** Made improvements based on user feedback to enhance usability.

5. Conclusion

The UI design and implementation of the biometric attendance mobile application focused on creating a user-friendly, secure, and efficient interface. By adhering to design principles, incorporating user feedback and ensuring accessibility, we have developed an application that meets the needs of students, lecturers, and administrators.