Cape Peninsula University of Technology

Project II: CPUT Module Tracker

- Individual Submission (Term 2)
- DUE DATE : 19 MAY 2025

Name:
NJANYANA XABA

Student Number:
223056359

Supervisor: S. Tswane

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1. Business Rules

Student Management

- Every student must have a unique student number and secure password.
- Student registration must include: full name, student number, year of study.
- A student cannot access the dashboard without successful login.

Module Enrollment

- Students can enroll in multiple modules.
- A module must have a valid code, name, and year level.
- Students can only enter marks for modules they are registered in.

Grade Recording

- Each assessment must be linked to a module and a student.
- Final grade calculations use weighted averages of assessments.
- System flags low-performing students for academic support.

Security Rules

- Passwords are hashed using SHA-256 before storage.
- Sessions expire after logout or inactivity to ensure security.

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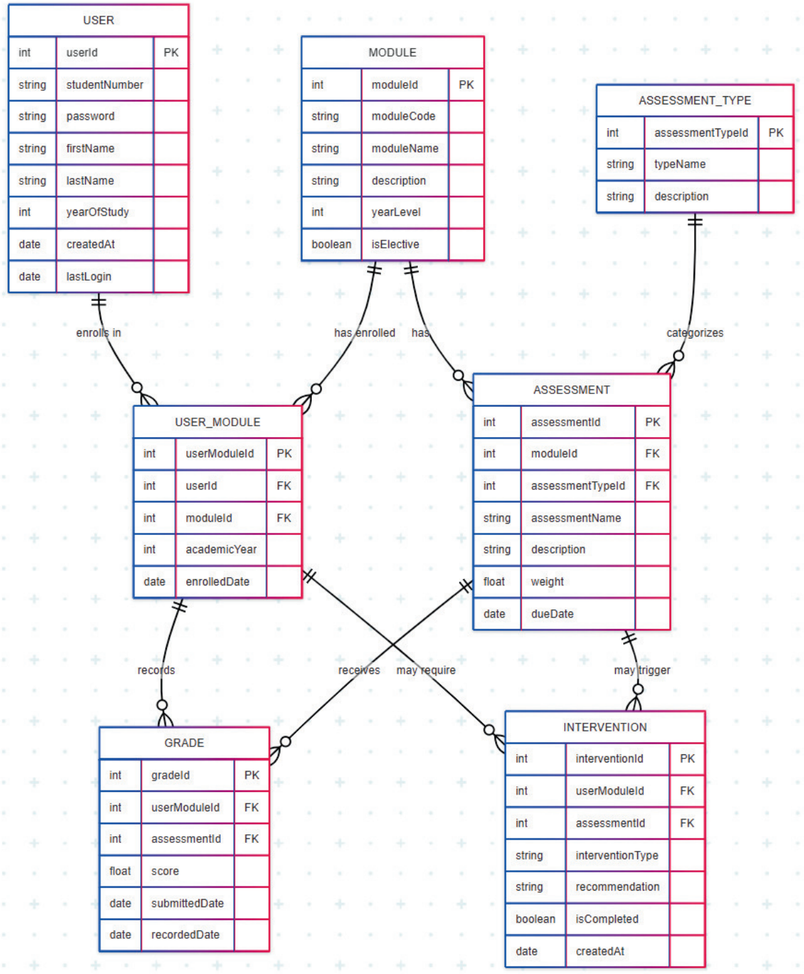
2. Data Design

MODULE TRACKER ERD DIAGRAM

Code | Docs

```
%% Student Name: Njanyana Xaba
%% Student Number: 223056359
%% CPUT Module Tracker - Entity Relationship Diagram

erDiagram
    USER {
        int userId PK
        string studentNumber
        string password
        string firstName
        string lastName
        int yearOfStudy
        date createdAt
        date lastLogin
    }
    MODULE {
        int moduleId PK
        string moduleCode
        string moduleName
        string description
        int yearLevel
        boolean isElective
    }
    USER_MODULE {
        int userModuleId PK
        int userId FK
        int moduleId FK
        int academicYear
        date enrolledDate
    }
    ASSESSMENT_TYPE {
        int assessmentTypeId PK
        string typeName
        string description
    }
    ASSESSMENT {
        int assessmentId PK
        int moduleId FK
        int assessmentTypeId FK
        string assessmentName
        string description
```



Prepared by:
Njanyana Xaba
Product Owner & Database Developer

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2. Data Design

Tables Overview

USER

- userId (PK) – Unique ID for each student
- studentNumber, firstName, lastName – Student info
- password – Hashed password for login
- yearOfStudy, createdAt, lastLogin

MODULE

- moduleId (PK)
- moduleCode, moduleName, description
- yearLevel, isElective

USER_MODULE

- userModuleId (PK) – Links students to modules
- userId, moduleId (FKs)
- academicYear, enrolledDate

ASSESSMENT_TYPE

- assessmentTypeId (PK)
- typeName, description

ASSESSMENT

- assessmentId (PK)
- moduleId, assessmentTypeId (FKs)
- assessmentName, description, weight, dueDate

GRADE

- gradeId (PK)
- userModuleId, assessmentId (FKs)
- score, submittedDate, recordedDate

INTERVENTION

- interventionId (PK)
- userModuleId, assessmentId (FKs)
- interventionType, recommendation, isCompleted, createdAt

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3. User Interface Design

My UI Interface (frontend) prototype was developed and shared on GitHub. I contributed to the planning of the layout and integrated database design with front-end forms, you can test the experience of the Module Tracker App using The Following.

PLEASE OPEN

Module Tracker All UI Interface ScreenShots

GitHub UI Interface:
https://github.com/NjanyanaJayteeXaba/PrototypeModuleTrackerUI_interface

GitHub Module Tracker Repository:
https://github.com/NjanyanaJayteeXaba/PrototypeModuleTrackerUI_interface/tree/main

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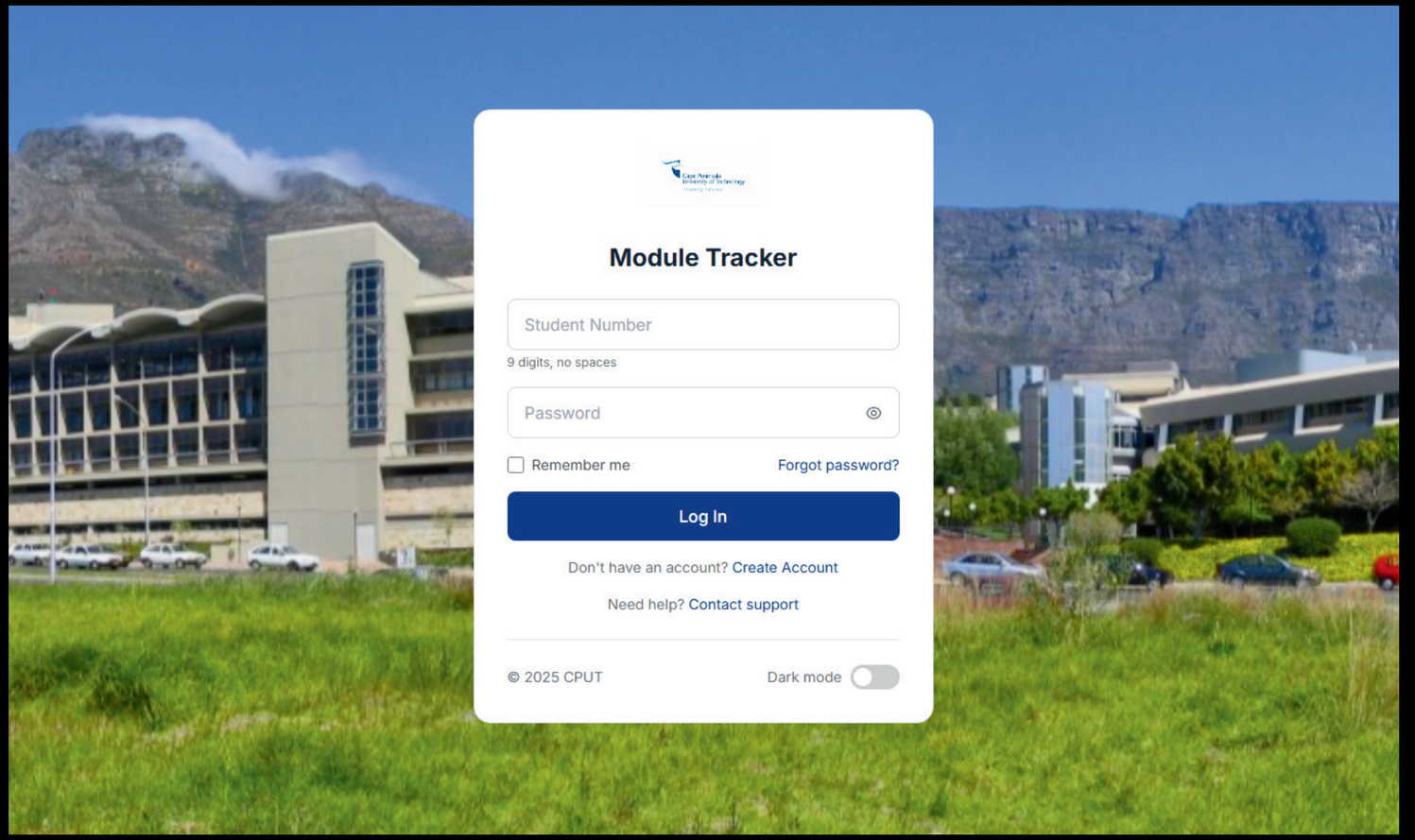
3. User Interface Design

LOGIN PAGE



Secure login screen that accepts student number and password.

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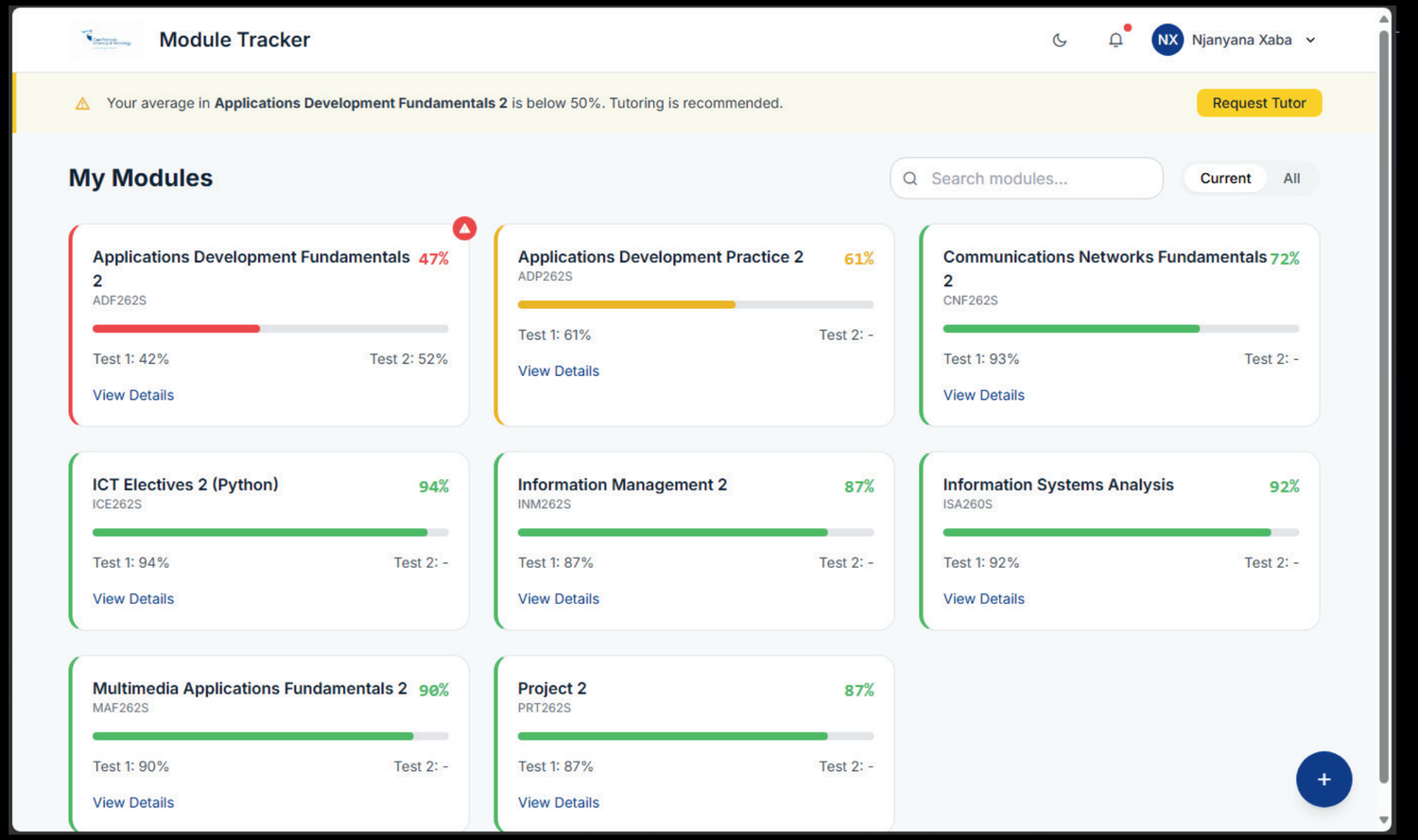
3. User Interface Design

DASHBOARD



Shows a student's overview: enrolled modules,alerts of failed modules, and grades.

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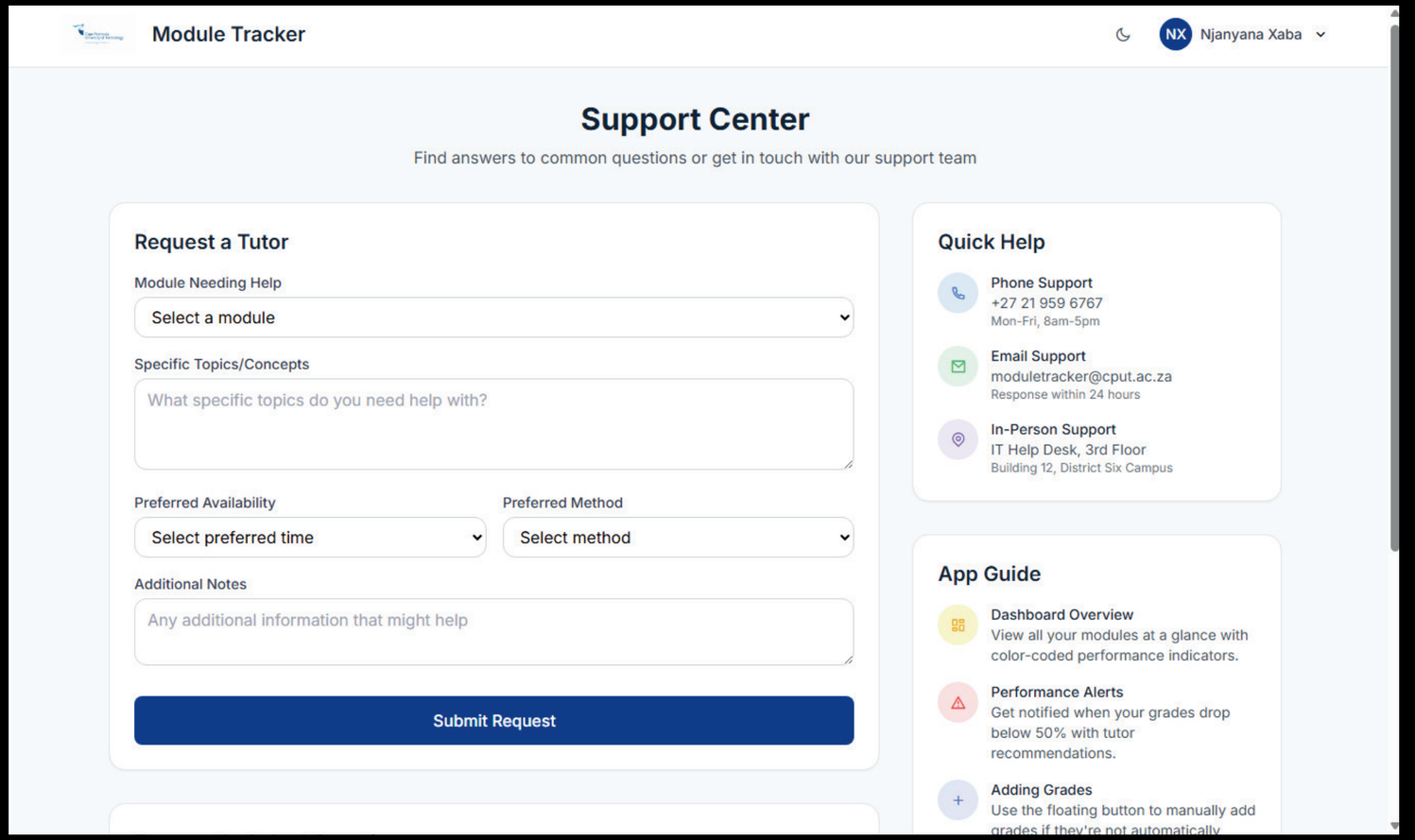
3. User Interface Design

TUTORING FORM



Tutoring form where you are requested to book first to see see if they tutor is available

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4. Self-Reflection

This term provided a solid technical foundation for me as a Product Owner and Database Developer. I had to move from planning to execution, and this shift taught me several real-world lessons.

Achievements:

- Finalized a normalized ERD diagrams and intteractive UI Interface.
- Created and tested SQL scripts for key tables and relationships.
- Also Managed to align database design with the frontend structure.
- Practiced version control using GitHub and worked collaboratively on shared repositories.

Challenges:

- I didn't know how to use figma to make this prototype because most platforms are new to me.
- Adjusting ERD as new requirements came in during team discussions.
- Understanding security best practices for password storage and data validation.
- Time management between classes and development work.

Personal Development:

- Improved SQL scripting and Java JDBC skills.
- Gained confidence working in a real-life MVC structure.
- Learned to collaborate better using GitHub and host using it.
- Learned to design go interactive UI Interface.

What I Want to Improve:

- Implementing unit tests for data-related methods (like grade calculations).
- Using hashing libraries (e.g., BCrypt) instead of plain SHA-256 for passwords.
- Learning how to deploy a web app online and handle database backups.

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