# Digital University System with Access Control Layer

## 1. Team Information

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## 2. Project Overview

The Digital University System is a role-based academic management platform integrating access control, authentication, and user authorization. It allows administrators, faculty, students, and registrars to manage academic data, courses, tuition, and reports securely.

## 3. Installation & Setup Instructions

• Prerequisites: Java 17 or later, NetBeans or IntelliJ IDE.  
• Clone the repository from GitHub.  
• Import the project into your IDE.  
• Run MainJFrame.java to launch the application.  
• Use the preconfigured login credentials to test each role.

## 4. Authentication & Access Control

The Access Control Layer enforces role-based permissions. Users must authenticate via username and password. Once logged in, access is restricted to authorized panels only. Logout ends the active session.

## 5. Features Implemented

• Course Management: View, update, and manage assigned courses.  
• Student Management: View enrolled students, grade assignments, and calculate GPA.  
• Reporting: Generate course-level performance reports and grade distributions.  
• Tuition Insight: View total tuition collected from enrolled students.

## 6. Usage Instructions

1. Launch the system using MainJFrame.java.  
2. Login with the assigned role credentials.  
3. Navigate through menus using the CardLayout-based interface.  
4. Perform CRUD operations, view reports, or manage data according to your role.  
5. Logout after use.

## 7. Testing Guide

• Test authentication by attempting incorrect and correct logins.  
• Validate that each role can only access authorized features.  
• Verify database updates when creating, editing, or deleting records.  
• Test null input validation for all form fields.

## 8. Challenges & Solutions

One challenge was integrating authentication across multiple user roles while maintaining a clean UI. We resolved this by implementing a centralized Access Control Layer and modularizing each use case panel.

## 9. Future Enhancements

• Add analytics dashboards for real-time academic data.  
• Introduce email notifications for tuition and grade updates.  
• Integrate cloud database for scalability.

## 10. Contribution Breakdown

Rohit Kumar (Faculty Use Case): Implemented core features, tested the use case, and integrated access control.