

SYSTEM

SCREENSHOTS

University ERP

Excellence in Academic Management

Welcome Back

Please enter your credentials to access your account.

USERNAME

PASSWORD

Show Password

Sign In

Demo: admin1 / inst1 / stu1 (Pass: admin123)

University ERP

Excellence in Academic Management

Welcome Back

Please enter your credentials to access your account.

USERNAME

 ×

PASSWORD

Show Password

Sign In

Demo: admin1 / inst1 / stu1 (Pass: admin123)

✗ Incorrect username or password.

University ERP

Excellence in Academic Management

Welcome Back

Please enter your credentials to access your account.

USERNAME

 ×

PASSWORD

Show Password

Sign In

Demo: admin1 / inst1 / stu1 (Pass: admin123)

✗ Account locked due to too many failed attempts.

University ERP

**System Administrator**
ADMIN

Dashboard

Users

Courses

Sections

System Settings

Home / Dashboard

Welcome back, System Administrator

Here's what's happening in Monsoon 2025

USER STATISTICS**5****2****2**

Total Users

Students

Instructors

ACADEMIC STATISTICS**6****10****4**

Courses

Sections

Enrollments

SYSTEM HEALTH**Operational**

Status

4

Active Users

Nov 24, 13:45

Last Backup

[Change Password](#)[Logout](#)**Notifications**[Clear All](#)

Final grades for section CS101 - A have been compu

Nov 24, 13:26

University ERP**System Administrator**
ADMIN

Dashboard

Users

Courses

Sections

System Settings

Change Password

Logout

Home / **User Management**

User Management

Search users...

Search

System Administrator

admin1 • ADMIN • active

Dr. John Smith

inst1 • INSTRUCTOR • active

Alice Johnson

stu1 • STUDENT • locked

Bob Williams

stu2 • STUDENT • active

Dr. Sarah Wilson

inst2 • INSTRUCTOR • active

Delete

Edit Selected

+ Add User

University ERP

System Administrator
ADMIN

Dashboard

Users

Courses

Sections

System Settings

Home / Course Management

Course Management

Search courses...

Search

BIO101 - Biology Basics

4 Credits - Active

CS101 - Introduction to Programming

4 Credits - Active

CS201 - Data Structures

4 Credits - Active

ENG101 - Technical Communication

2 Credits - Active

MATH101 - Calculus I

4 Credits - Active

PHY101 - Physics I

3 Credits - Active

Change Password

Logout

Prerequisites

Delete

Edit

+ New Course

University ERP

System Administrator
ADMIN

Dashboard

Users

Courses

Sections

System Settings

Change Password

Logout

Home / Section Management

Section Management

BIO101 - Sec A

Monsoon 2025 • Dr. John Smith

CS101 - Sec A

Monsoon 2025 • Dr. John Smith

CS101 - Sec B

Winter 2025 • Dr. John Smith

CS201 - Sec A

Winter 2025 • Dr. John Smith

ENG101 - Sec A

Monsoon 2025 • Dr. Sarah Wilson

ENG101 - Sec B

Winter 2025 • Dr. Sarah Wilson

MATH101 - Sec A

Monsoon 2025 • Dr. Sarah Wilson

MATH101 - Sec A

Winter 2025 • Dr. Sarah Wilson

PHY101 - Sec A

Winter 2025 • Dr. John Smith

Delete**Edit****+ New Section**

University ERP

System Administrator
ADMIN

Dashboard

Users

Courses

Sections

System Settings

Home / System Settings

System Settings

System Status

 Maintenance Mode

When active, students and instructors have Read-Only access.
Admins retain full control.

Current Term

SEMESTER

Monsoon

YEAR

2,025

Announcements

Target:

Data Management

University ERP

System Administrator
ADMIN

Dashboard

Users

Courses

Sections

System Settings

Home / System Settings

System Settings

System Status

 Maintenance Mode

When active, students and Admins retain full control.

Update Status

Announcements

Target:

Change Password

CURRENT PASSWORD

NEW PASSWORD

CONFIRM PASSWORD

Update Password

Data Management

Backup DatabaseRestore DatabaseChange PasswordLogout

Current Term

SEMESTER

Monsoon

YEAR

2,025

Save Term

⚠ SYSTEM UNDER MAINTENANCE - View Only Mode

University ERP

System Administrator
ADMIN

Dashboard

Users

Courses

Sections

System Settings

Home / System Settings

System Settings

System Status

 Maintenance Mode

When active, students and instructors have Read-Only access.
Admins retain full control.

Current Term

SEMESTER

Monsoon

YEAR

2,025

Announcements

Target:

Data Management

⚠ SYSTEM UNDER MAINTENANCE - View Only Mode

University ERP

**Bob Williams**
STUDENT

Dashboard

Course Catalog

My Courses

My Grades

Transcript

Timetable

[Change Password](#)[Logout](#)Home / **Dashboard**

Welcome back, Bob

Here's what's happening in Monsoon 2025

NEXT CLASS**PHY101 - Sec B**

PHY-201 - Tue/Thu 14:00-15:20

Academic Progress
N/A**1 Enrolled****1 Pending Grades****Notifications**[Clear All](#)

SYSTEM ALERT: Maintenance Mode is now ON. Func

Nov 24, 14:00

Successfully dropped CS101 - A

Nov 24, 13:23

⚠ SYSTEM UNDER MAINTENANCE - View Only Mode

University ERP

**Bob Williams**
STUDENT

Dashboard

Course Catalog

My Courses

My Grades

Transcript

Timetable

Change Password

Logout

Home / Dashboard

Welcome back, Bob

Here's what's happening in Monsoon 2025

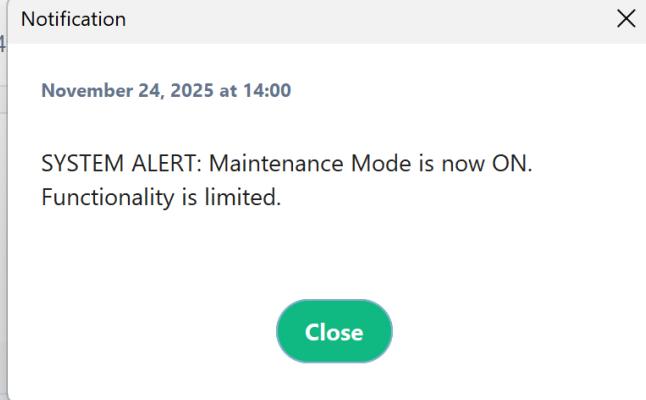
NEXT CLASS

PHY101 - Sec B

PHY-201 - Tue/Thu 14:

Academic Progress

1 Enrolled



Notifications

[Clear All](#)SYSTEM ALERT: Maintenance Mode is now ON. Functionality is limited.
Nov 24, 14:00Successfully dropped CS101 - A
Nov 24, 13:23

⚠ SYSTEM UNDER MAINTENANCE - View Only Mode

University ERP

Bob Williams
STUDENT

Dashboard

Course Catalog

My Courses

My Grades

Transcript

Timetable

Home / Course Catalog

Course Catalog

Search by Course Name or Code...

Filter

Clear

CS101 • 4 Credits

Introduction to Programming

Sec A

Instr: Dr. John Smith

Mon/Wed 10:00-11:50 • CS-105



1/50 Seats Taken

Register

ENG101 • 4 Credits

Technical Communication

Sec A

Instr: Dr. Sarah Wilson

Fri 14:00-15:50 • LH-301



1/100 Seats Taken

Register

MATH101 • 4 Credits

Calculus I

Sec A

Instr: Dr. Sarah Wilson

Mon/Wed/Fri 09:00-09:50 • MATH-101

0/60 Seats Taken

Register

Change Password

Logout

⚠ SYSTEM UNDER MAINTENANCE - View Only Mode

University ERP

**Bob Williams**
STUDENT

Dashboard

Course Catalog

My Courses

My Grades

Transcript

Timetable

Home / **Grades**

My Grades

PHY101

Component	Score	Max	Weight	%
Lab	0.0	50.0	25.0%	0.0%
Midterm	0.0	100.0	25.0%	0.0%
Final	0.0	100.0	50.0%	0.0%

Total Weighted Score: 0.00% | Final Grade: N/A[Change Password](#)[Logout](#)

⚠ SYSTEM UNDER MAINTENANCE - View Only Mode

University ERP

Bob Williams
STUDENT

Dashboard

Course Catalog

My Courses

My Grades

Transcript

Timetable

Home / Transcript

Academic Transcript

BOB WILLIAMS

[Download CSV](#)[Download PDF](#)

Semester	Course Code	Title	Credits	Grade
Monsoon 2025	PHY101	Physics I	3	IP

[Change Password](#)[Logout](#)

UNIVERSITY ERP SYSTEM

Academic Transcript

Student Name: Bob Williams
Roll Number: B-1002
Program: Electronics and Communication Engineering
Generated: 2025-11-24

Course	Title	Credit s	Semester	Year	Final Grade
PHY101	Physics I	3	Monsoon	2025	IP
Total Credits Earned: 0					

Generated on 2025-11-24 by University ERP System

This is a computer-generated document. No signature is required.

⚠ SYSTEM UNDER MAINTENANCE - View Only Mode

University ERP

Bob Williams
STUDENT

Dashboard

Course Catalog

My Courses

My Grades

Transcript

Timetable

Change Password

Logout

Home / Timetable

My Weekly Schedule

	Mon	Tue	Wed	Thu	Fri
08:00					
09:00					
10:00					
11:00					
12:00					
13:00					
14:00					
15:00		PHY101 PHY-201			PHY101 PHY-201
16:00					
17:00					

University ERP

Dr. John Smith
INSTRUCTOR

Dashboard

My Sections

[Change Password](#)[Logout](#)

Home / Dashboard

Welcome back, Dr.

Here's what's happening in Monsoon 2025

ACTION ITEM**PHY101 Section B**

1 students need grades

TEACHING OVERVIEW**6**

Sections

3

Students

2

Pending

Notifications[Clear All](#)

SYSTEM ALERT: Maintenance Mode is now ON. Functionality may be limited.

Nov 24, 14:00

Student Bob Williams (ID: 4) has dropped your section.

Nov 24, 13:23

Student Alice Johnson (ID: 3) has enrolled in your section.

Nov 24, 13:21

Reminder: Please set up your grade components for the new term.

Nov 24, 13:13

⚠ SYSTEM UNDER MAINTENANCE - View Only Mode

University ERP

Dr. John Smith
INSTRUCTOR

Dashboard

My Sections

Home / My Sections

My Sections

SELECT A SECTION TO MANAGE GRADES

Monsoon 2025

BIO101 - A

⌚ Mon/Wed 10:00-11:00

📍 Lab 101

1 / 1 Students

[Open Gradebook](#)

Monsoon 2025

CS101 - A

⌚ Mon/Wed 10:00-11:50

📍 CS-105

1 / 50 Students

[Open Gradebook](#)

Winter 2025

CS101 - B

⌚ Tue/Thu 09:00-10:50

📍 CS-106

0 / 45 Students

[Open Gradebook](#)

Winter 2025

CS201 - A

⌚ Tue/Thu 10:00-11:50

📍 CS-107

0 / 40 Students

[Open Gradebook](#)

Winter 2025

PHY101 - A

⌚ Mon/Wed 14:00-15:20

📍 PHY-202

0 / 35 Students

[Open Gradebook](#)

Monsoon 2025

PHY101 - B

⌚ Tue/Thu 14:00-15:20

📍 PHY-201

1 / 30 Students

[Open Gradebook](#)[Change Password](#)[Logout](#)

⚠ SYSTEM UNDER MAINTENANCE - View Only Mode

University ERP

Dr. John Smith
INSTRUCTOR

Dashboard

My Sections

[Change Password](#)[Logout](#)

Home / Gradebook

[← Back to Sections](#)

CS101 - A

1 Students • 3 Assessments

[Components](#)[Import CSV](#)[Analytics](#)[Export PDF](#)[Compute Finals](#)[Save Changes](#)

Roll No	Student Name	Quiz (20.0)	Midterm (100.0)	End-Sem (100.0)	Final Grade
B-1001	Alice Johnson	18	85	84	B

⚠ SYSTEM UNDER MAINTENANCE - View Only Mode

University ERP

Dr. John Smith
INSTRUCTOR

Dashboard

My Sections

Home / Gradebook

[← Back to Sections](#)

CS101 - A

1 Students • 3 Assessments

[Components](#)[Import CSV](#)[Analytics](#)[Export PDF](#)[Compute Finals](#)[Save Changes](#)

End-Sem (100.0)

Final Grade

84

B

Manage Grade Components

Current Components

- Quiz (20.0% / Max 20.0)
- Midterm (30.0% / Max 100.0)
- End-Sem (50.0% / Max 100.0)

B-1001

New Component

NAME

Name (e.g. Quiz 1)

WEIGHT %

10

MAX SCORE

100

[Delete Selected](#)[Add Component](#)[Change Password](#)[Logout](#)

University ERP



Dr. John Smith
INSTRUCTOR

Dashboard

My Sections

Change Password

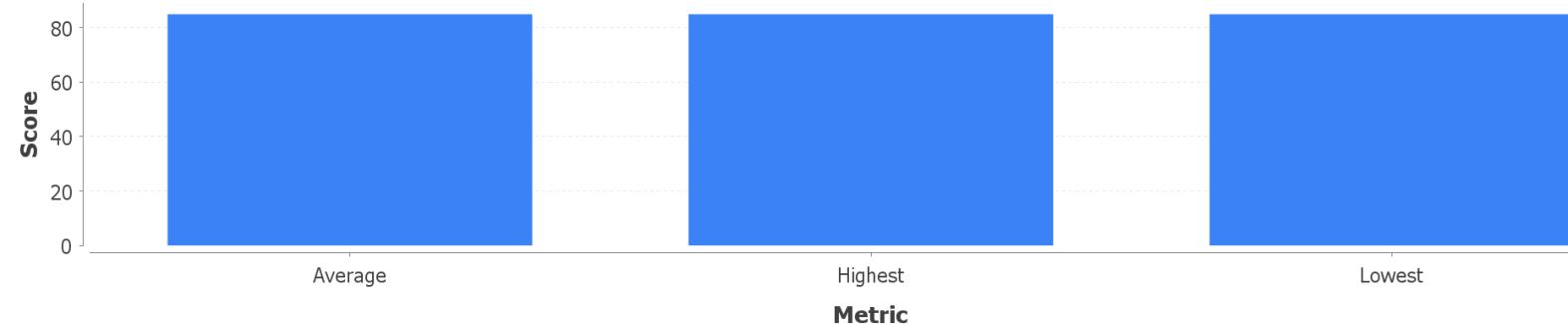
Logout

Home / Class Analytics

[← Back to Gradebook](#)

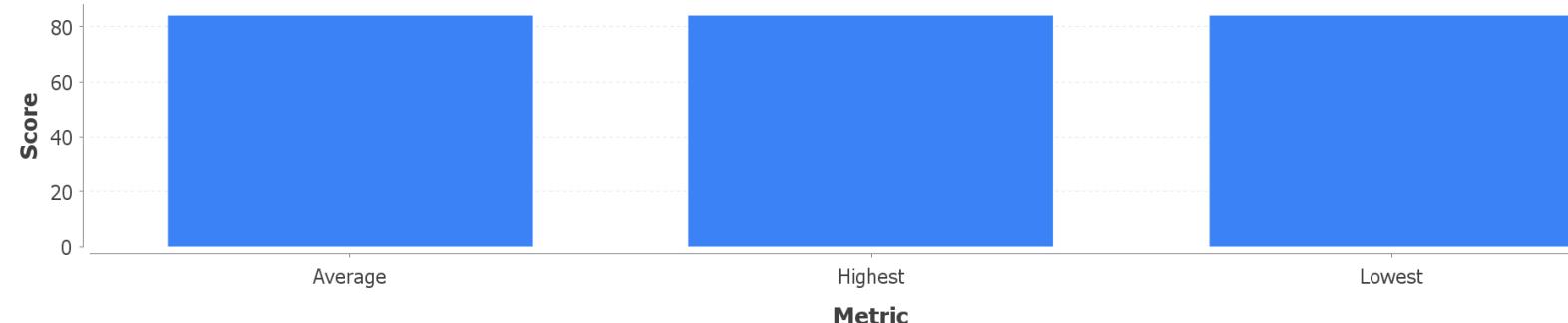
Statistics: CS101 - A

Midterm Performance



Avg: 85.0 Max: 100 Count: 1

End-Sem Performance



UNIVERSITY ERP SYSTEM

Class Grade Report

Course: CS101 - Section A

Date: 2025-11-24

Instructor: Dr. John Smith

Total Students: 1

#	Roll No	Student Name	Quiz (20%)	Midterm (30%)	End-Sem (50%)	Final Grade
1	B-1001	Alice Johnson	18.0	85.0	84.0	B

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**PROJECT REPORT
&
TECHNICAL
DETAILS**

University ERP System Project Report

Agrim Upadhyay (2024046)

Saksham Verma (2024497)

November 2025

1 Database Schema Design

The system implements a dual-database architecture to ensure strict separation between authentication credentials and academic data, enhancing security and scalability.

1.1 Authentication Database (`university_auth`)

This database manages user identity and access credentials.

- **users_auth:** Stores core user credentials including `username`, `role` (admin/student/instructor), and the BCrypt `password_hash`. It also tracks account status (`active/locked`) and `failed_attempts` for security.
- **password_history:** Stores the last 5 password hashes per user to enforce history policies during password changes.

1.2 ERP Database (`university_erp`)

This database stores all academic and operational data.

- **students & instructors:** Profile tables linked to `users_auth` via `user_id`.
- **courses:** Stores catalog details like code, title, credits, and prerequisites.
- **sections:** Represents specific offerings of a course (Semester, Year, Instructor) with capacity and deadline constraints.
- **enrollments:** Links students to sections with status tracking (`registered`, `dropped`) and final grades.
- **grade_components:** Defines the assessment structure for a section (e.g., Quiz 20%, Midterm 30%).
- **grades:** Stores individual student scores for each component.
- **notifications:** Stores user-specific alerts and system-wide announcements.
- **settings:** Manages global configurations like `maintenance_mode`, `current_semester`, and `current_year`.
- **backup_logs:** Tracks the history of database backup operations.

2 Final Grade Calculation Logic

The system automates the computation of final grades based on a dynamic weighting schema defined by the instructor.

2.1 Weighting Formula

The final score is calculated as a weighted sum of normalized component scores:

$$\text{Final Score} = \sum_i \left(\frac{\text{Score}_i}{\text{MaxScore}_i} \times \text{Weight}_i \right)$$

Constraint: The sum of all weights ($\sum \text{Weight}_i$) must equal 100%.

2.2 Letter Grade Mapping

The calculated percentage is mapped to a letter grade using the following scale:

Percentage Range	Letter Grade
90.0 – 100.0	A
80.0 – 89.99	B
70.0 – 79.99	C
60.0 – 69.99	D
Below 60.0	F

3 Security & Access Control Implementation

Security is enforced through a centralized service layer that validates every request before database interaction.

3.1 Role-Based Access Control (RBAC)

The `AccessControlService` intercepts all critical actions. It checks the current user's role stored in the `SessionManager` against a permission matrix.

- **Students:** Restricted to viewing their own data and registering/dropping sections.
- **Instructors:** Restricted to managing grades for *only* sections they are assigned to.
- **Admins:** Granted full access to all management modules.

3.2 Maintenance Mode Enforcement

Maintenance Mode is a system-wide boolean flag stored in the `settings` table.

- When **Enabled**: The `AccessControlService` blocks all "write" operations (Registration, Grade Entry, Drop Section) for Students and Instructors.
- **Admin Bypass**: Administrators retain full access to perform maintenance tasks.
- **UI Feedback**: A persistent orange banner alerts all logged-in users of the restricted state.

3.3 Credential Security

- **Hashing:** All passwords are hashed using **BCrypt** (12 rounds) with per-user salting. Plaintext passwords are never stored.
- **Account Lockout:** After 5 consecutive failed login attempts, the account is locked for 15 minutes.

4 Implemented Bonus Features

The following extra features were implemented to enhance system utility and robustness:

1. CSV Import/Export:

- Instructors can bulk-import student grades from CSV files.
- Students can export their transcripts to CSV format.

2. PDF Generation:

- Students can generate professional, official-style PDF transcripts.
- Instructors can export class performance reports as PDF documents.

3. Database Backup & Restore:

- Integrated `mysqldump` functionality allows Admins to create full SQL backups of both databases directly from the UI.
- Restore functionality allows rolling back the system to a previous state.

4. Notifications System:

- Real-time alerts for events like successful registration or grade posting.
- Broadcast capability for Admins to send announcements to specific user roles.

5. Change Password & History:

- Users can change their passwords securely.
- The system enforces a history policy preventing the reuse of the last 5 passwords.