

University ERP System

Short Report

1. Introduction

This report presents the design, implementation, and functioning of the University ERP System developed using Java Swing and MySQL. The application supports three roles—Admin, Instructor, and Student—each with specific permissions and workflows. The system uses two databases: Auth DB (for login + roles) and ERP DB (for academic data).

2. System Architecture Overview

The project follows a clean layered structure:

- UI Layer (Swing Panels in edu.univ.erp.ui)
- API Layer (edu.univ.erp.api.*) separating UI and services
- Service Layer (edu.univ.erp.service)
- Data Access Layer (edu.univ.erp.data)
- Auth Layer (edu.univ.erp.auth) for login + password hashing
- Domain Models (edu.univ.erp.domain)
- Utility Layer (edu.univ.erp.util) for CSV exports

. Database Design (Both DBs)

The system uses two separate databases to enforce security:

AUTH_DB (users_auth):

- user_id (Primary Key)
- username (unique)

- role (Student/Instructor/Admin)
- password_hash
- status
- last_login

ERP_DB Tables:

- students(user_id, roll_no, program, year)
- instructors(user_id, department)
- courses(course_id, code, title, credits)
- sections(section_id, course_id, instructor_id, day_time, room, capacity, semester, year)
- enrollments(enrollment_id, student_id, section_id, status)
- grades(grade_id, enrollment_id, component, score, final_grade)
- settings(setting_key, setting_value) (for Maintenance Mode)

4. Role-Based Access Enforcement

Every action checks user role and maintenance mode:

- Admin: Full CRUD on users, courses, sections;
- Instructor: Only their assigned sections; cannot edit others.
- Student: Only their own data.
- Maintenance Mode ON: Students & instructors become read-only.

These rules are enforced inside the Service Layer using guard checks.

5. Feature Summary

STUDENT:

- Browse course catalog
- Register/drop sections (with seat + deadline checks)

- View timetable
- Check grades
- Download transcript (CSV)

INSTRUCTOR:

- View assigned sections
- Enter assessment scores
- Compute final grade (20% Quiz, 30% Midterm, 50% End-sem)
- Export grade CSV

ADMIN:

- Create users (Auth DB + ERP DB profiles)
- Create/edit/delete courses
- Create/edit/delete sections
- Assign instructor
- Toggle Maintenance Mode

6. Final Grade Weighting Rule

The application supports customizable final-grade computation, configurable by the instructor for each section. When the instructor selects “Compute Final”, a weight-setter dialog appears with three editable fields:

- Quiz %
- Midterm %
- End-sem %

(Default values pre-filled: 20%, 30%, 50%, but the instructor may change them to any valid percentages that sum to 100.)

Once weights are set, the application computes:

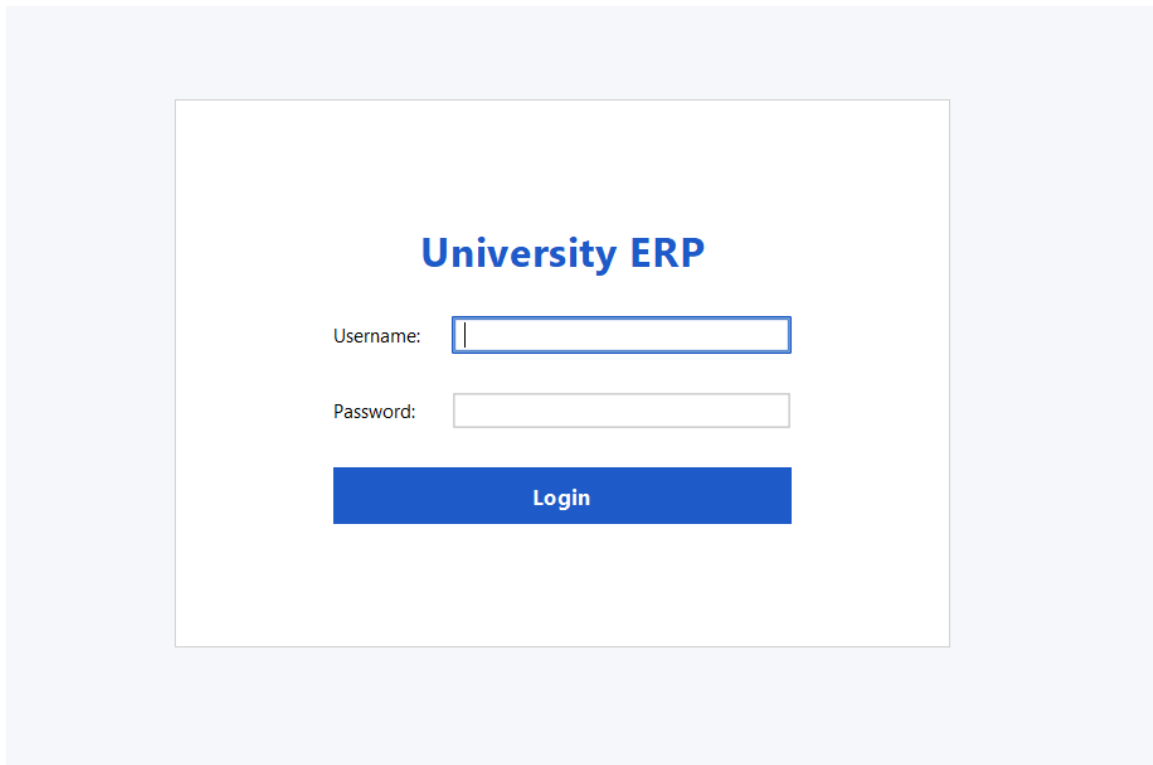
$$\text{Final Score} = \left(\frac{\text{QuizWeight}}{100}\right) \cdot \text{QuizScore} + \left(\frac{\text{MidWeight}}{100}\right) \cdot \text{MidtermScore} + \left(\frac{\text{EndWeight}}{100}\right) \cdot \text{EndSemScore}$$

7. Bonus Features Implemented

- CSV export for grades (Instructor)
- CSV export for transcript (Student)
- Change Password dialog
- Login lockout after 5 incorrect attempts

8. Screenshots

- Login Screen



Student

• Catalog Page

Student Dashboard

Change Password

Logout

Catalog

My Sections

Timetable

Grades

Code	Title	Credits	Capacity	Instructor
CS101	Introduction to Programming	4	50	inst1
CS102	Data Structures	4	70	inst1
CS103	Object-Oriented Programming	3	35	inst1
CS201	Algorithms	4	45	inst1
CS301	Operating Systems	4	60	inst1
AB	mk1ma	4	60	inst1
anbbc	jqkjq	4	30	inst4
ddw	wd	3	30	inst1
cs192	njknkdw	3	0	-

Register Selected

• Timetable Page

Student Dashboard

Change Password

Logout

Catalog

My Sections

Timetable

Grades

Student Timetable

Filter

Refresh

	Monday	Tuesday	Wednesday	Thursday	Friday
08:00					CS301 Operating Systems Friday • 08:00 • 0101
09:00			CS103 Object-Oriented Programming Wednesday • 09:00 • A303		
10:00-11:00	anbbc jqkjq Monday • 10:00-11:00 • 22	anbbc jqkjq Tuesday • 10:00-11:00 • 22			
11:00		CS102 Data Structures Tuesday • 11:00 • C202			
14:00	CS101 Introduction to Programming Monday • 14:00 • B101			CS101 Introduction to Programming Thursday • 14:00 • B101	

• Grades Page

Student Dashboard

Change Password

Logout

Catalog

My Sections

Timetable

Grades

Course Code	Quiz	Midterm	End Sem	Final Grade
CS101	100.0	99.0	99.0	99.2
CS102	90.0	90.0	92.0	95.8
CS103	0.0	0.0	0.0	0.0
CS201	0.0	0.0	0.0	0.0
CS301	22.0	0.0	0.0	0.0
anbbc	0.0	0.0	0.0	0.0

Refresh

Export Transcript CSV

Instructor

• Instructor Grade Entry Screen

Instructor Dashboard

Change Password

Logout

My Sections

Gradebook

Statistics

Section: Sec#1 — CS101 (Introduction to Programming) [Spring 2025]

Refresh Sections

Load Students

Refresh Enrollments

EnrollmentId	StudentId	Status	Quiz	Midterm	End Sem	Final Grade
1	3	active	100.0	99.0	99.0	99.2

Weight %

Quiz %: 20

Midterm %: 30

End-sem %: 50

OK

Cancel

Save Score

Compute Finals

Export CSV

• Statistics

Instructor Dashboard

My Sections

Gradebook

Statistics

Section: Sec#1 — CS101 (Introduction to Programming) [Spring 2025]

Refresh Sections

Load Stats

Change Password

Logout

Total Students Graded

1

Average Final Grade

99.20

Minimum Score

99.20

Maximum Score

99.20

Admin

• Admin User Management

Admin Console

Users

Courses

Sections

Settings

Refresh

Add User

Change Password

Logout

Userid	Username	Role
7	abc	Student
10	abc12	Student
1	admin1	Admin
11	admin4	Admin
2	inst1	Instructor
8	inst4	Instructor
3	stu1	Student
4	stu2	Student
12	stu5	Student
14	stu99	Student

?

Create User

X

Username:

Role:

Student

Password:

OK

Cancel

• Admin Course Panel

Admin Console

Change Password

Login

Users

Courses

Sections

Settings

Refresh

Add Course

Edit Course

CourseId	Code	Title	Credits
1	CS101	Introduction to Programming	4
2	CS102	Data Structures	4
3	CS103	Object-Oriented Programming	3
4	CS201	Algorithms	4
5	CS301	Operating Systems	4
6	AB		4
7	anbbc		4
8	ddw		3
9	cs192		3

?

Add Course

X

Code:

Title:

Credits:

4

OK

Cancel

• Admin Section Panel

Admin Console

Change Password

Login

Users

Courses

Sections

Settings

Refresh

Add Section

Edit Section

SectionId	CourseId	Course	InstructorId	DayTime	Room	Capacity	Semester	Year
1	1	Introduction to Programming	2	Mon thu 14:00	B101	50	Spring	2025
2	2	Data Structures	2	Tue 11:00	C202	40	Spring	2025
3	3	Object-Oriented Programming	2	Wed 09:00	A303	35	Spring	2025
4	4	Algorithms	2	Thu 14:00	B202	45	Spring	2025
5	5	Operating Systems	2	Fri 08:00	D101	60	Spring	2025
9	6	mkima	2	Mon 10:00-11:00	8	30	Fall	2025
10	6	mkima	8	Mon 10:00	99	30	Fall	2025
11	2	Data Structures	2	mon tues 11:00	5	30	Fall	2025
12	7	jkljql	8	mon tues 10:00-11:00	22	30	Spring	2025
13	8	wd	2	Mon 11:00	2211	30	Fall	2025

• Admin Section Panel

Admin Console

Change PasswordLogout

UsersCoursesSectionsSettings

ERP Settings

Maintenance Mode:

☐ Enable

Register Deadline (YYYY-MM-DD):

2025-11-26

Drop Deadline (YYYY-MM-DD):

2025-11-27

Save Settings

• Maintenance Mode Banner

Admin Console

Change PasswordLogout

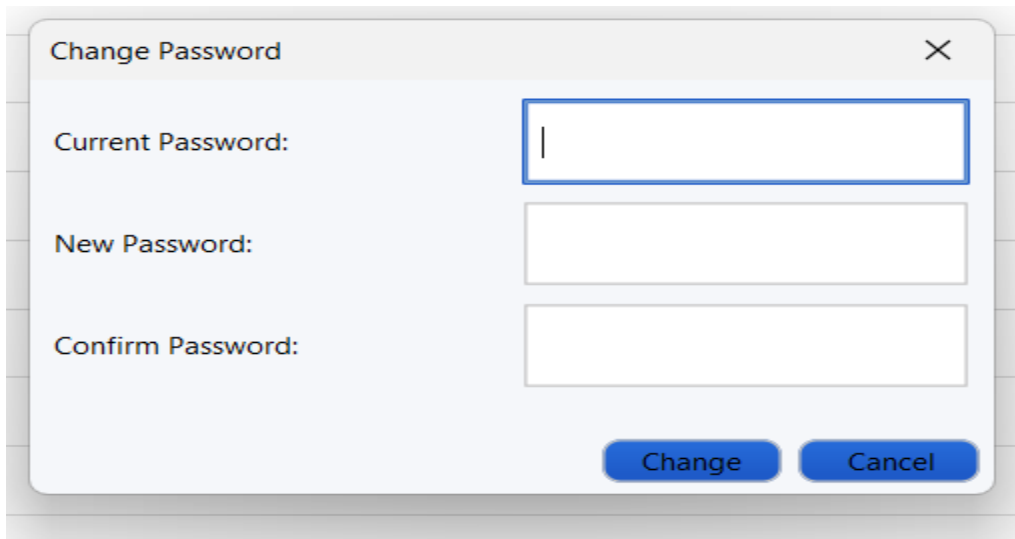
MAINTENANCE MODE ACTIVE — Students & Instructors are READ-ONLY

UsersCoursesSectionsSettings

RefreshAdd User

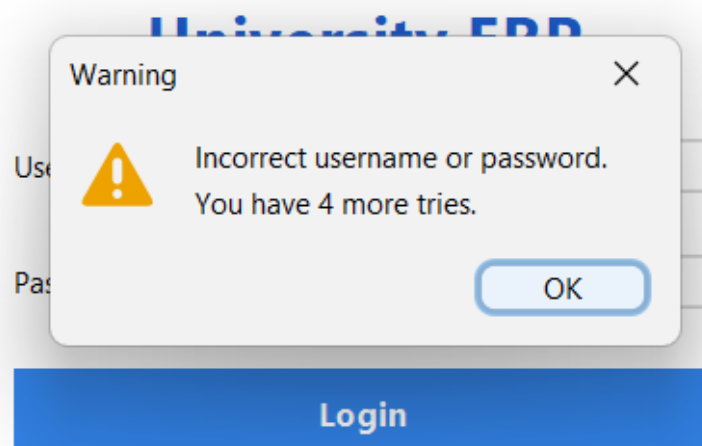
Userid	Username	Role
7	abc	Student
10	abc12	Student
1	admin1	Admin
11	admin4	Admin
2	inst1	Instructor
8	inst4	Instructor
3	stu1	Student
4	stu2	Student
12	stu5	Student
14	stu99	Student

- Change Password dialog



A dialog box titled "Change Password" with a close button (X) in the top right corner. It contains three input fields: "Current Password:", "New Password:", and "Confirm Password:". The "Current Password:" field is currently active, showing a vertical cursor. At the bottom right, there are two buttons: "Change" and "Cancel".

- Login lockout after 5 incorrect attempts



A warning dialog box titled "Warning" with a close button (X) in the top right corner. It features a yellow warning triangle icon on the left. The text inside reads: "Incorrect username or password. You have 4 more tries." At the bottom right, there is an "OK" button. In the background, a blue "Login" button is visible, along with partially obscured text for "Username" and "Password" fields.

9. Conclusion

The University ERP System provides a secure, role-based academic management workflow with clear separation of authentication and academic data. The system meets the functional requirements and supports extensibility for future features.