

# 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:

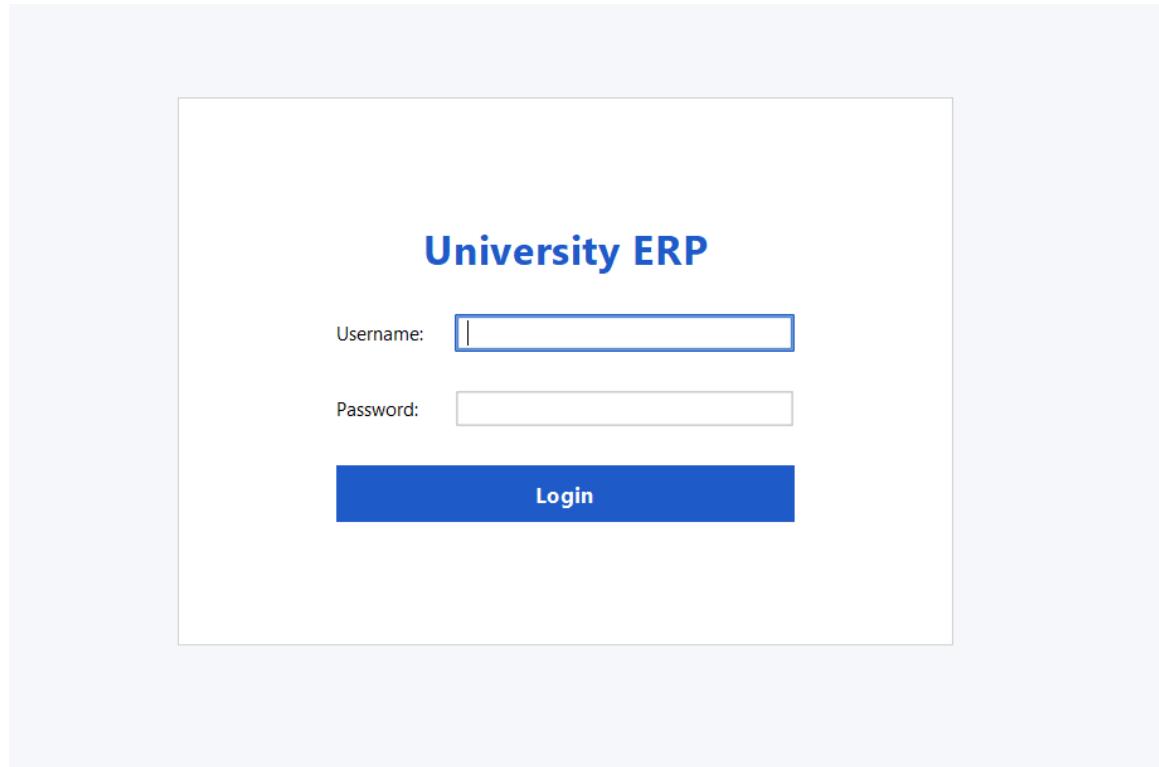
$$\text{Final Score} = \left( \frac{\text{QuizWeight}}{100} \right) \cdot \text{QuizScore} + \left( \frac{\text{MidWeight}}{100} \right) \cdot \text{MidtermScore} + \left( \frac{\text{EndWeight}}{100} \right) \cdot \text{EndSemScore}$$

## **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

Catalog My Sections Timetable Grades Change Password Logout

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	mklma	4	60	inst1
anbbc	jqljsq	4	30	inst4
ddw	wd	3	30	inst1
cs192	njkniefw	3	0	-

Register Selected

- Timetable Page

Student Dashboard

Catalog My Sections Timetable Grades Change Password Logout

Student Timetable

Filter Refresh

	Monday	Tuesday	Wednesday	Thursday	Friday
08:00					
09:00					
10:00-11:00	anbbc jqljsq Monday • 10:00-11:00 • 22	anbbc jqljsq Tuesday • 10:00-11:00 • 22	CS103 Object-Oriented Programming Wednesday • 09:00 • A103		CS301 Operating Systems Friday • 09:00 • D101
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**

Catalog My Sections Timetable **Grades** Change Password Logout

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

Print Refresh Export Transcript CSV

## Instructor

- Instructor Grade Entry Screen

**Instructor Dashboard**

My Sections **Gradebook** Statistics Change Password Logout

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

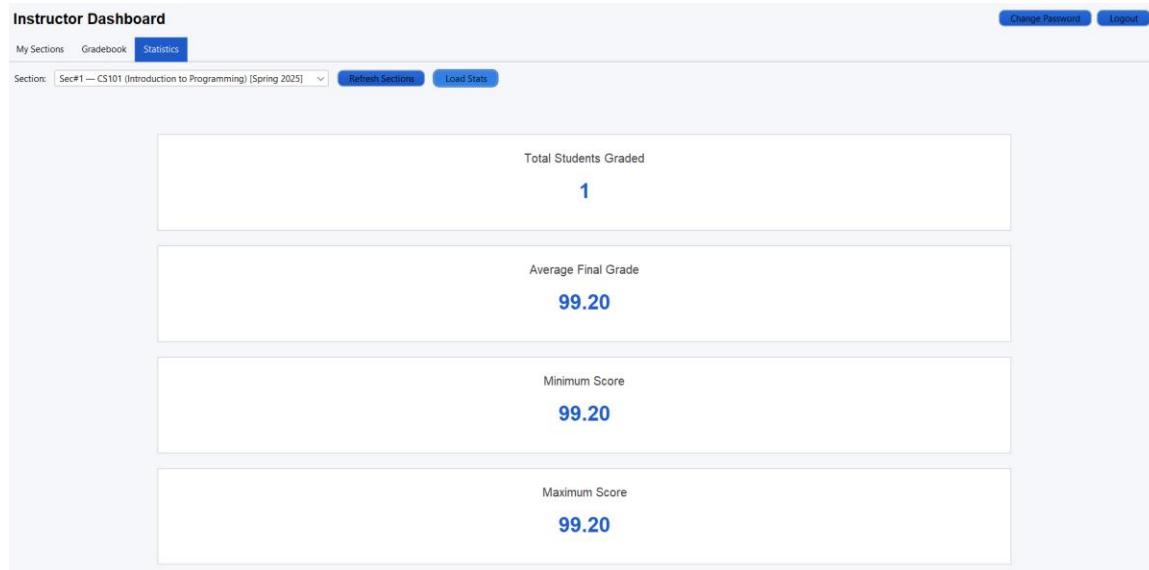
Weight %

Quiz %: 20  
Midterm %: 30  
End-sem %: 50

OK Cancel

Save Score Compute Finals Export CSV

- Statistics



## Admin

- Admin User Management

The screenshot shows the 'Admin Console' with the 'Users' tab selected. At the top, there are links for 'Users', 'Courses', 'Sections', and 'Settings'. Below that, there are buttons for 'Refresh' and 'Add User'. A modal window titled 'Create User' is open in the center, prompting for 'Username', 'Role' (set to 'Student'), and 'Password'. The background table lists users with their 'UserId', 'Username', and 'Role':

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

• Admin Course Panel

The screenshot shows the Admin Console interface with the 'Courses' tab selected. A modal window titled 'Add Course' is open in the center, prompting for 'Code', 'Title', and 'Credits'. The table below lists courses with their details.

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

• Admin Section Panel

The screenshot shows the Admin Console interface with the 'Sections' tab selected. A table displays section details across various columns including SectionId, CourseId, Course, InstructorId, DayTime, Room, Capacity, Semester, and Year.

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	mkrlma	2	Mon 10:00-11:00	8	30	Fall	2025
10	6	mkrlma	8	Mon 10:00	99	30	Fall	2025
11	2	Data Structures	2	mon tues 11:00	5	30	Fall	2025
12	7	jokjsq	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

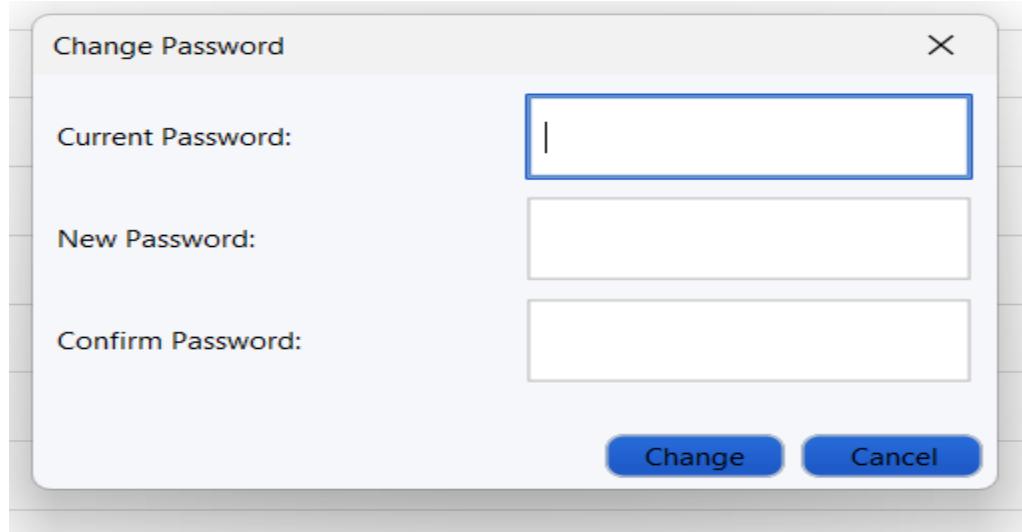
The screenshot shows the Admin Console interface with the 'Settings' tab selected. A modal dialog box titled 'ERP Settings' is open in the center. It contains three input fields: 'Maintenance Mode:' with an unchecked checkbox labeled 'Enable', 'Register Deadline (YYYY-MM-DD):' with the value '2025-11-26', and 'Drop Deadline (YYYY-MM-DD):' with the value '2025-11-27'. A blue 'Save Settings' button is at the bottom.

- Maintenance Mode Banner

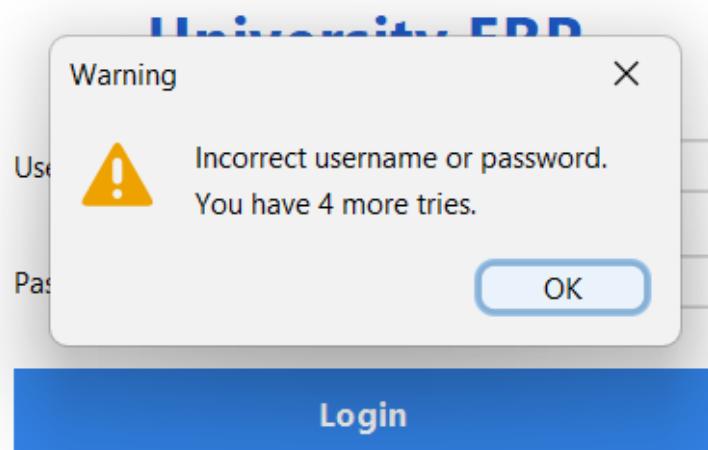
The screenshot shows the Admin Console interface with a blue banner at the top stating 'MAINTENANCE MODE ACTIVE — Students & Instructors are READ-ONLY'. Below the banner, the 'Users' tab is selected, showing a table of user data. The table has columns for 'UserId', 'Username', and 'Role'. The data is as follows:

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



- Login lockout after 5 incorrect attempts



## **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.