



# AP Test Summary

## University ERP

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## 1 Test Plan

### 1.1 Overview

This Test Plan outlines the functional, negative, UI, and security tests carried out for the University ERP System. The purpose is to validate that all major workflows (Admin, Instructor, and Student) function correctly and satisfy the Acceptance Tests defined in the project specification.

All tests were performed using a local MySQL instance populated with a small test dataset (1 Admin, 1 Instructor, 2 Students, 2 sample courses, 2 sections, and initial enrollments). The system was executed via the project's `Main` class.

### 1.2 Test Environment

- **Operating System:** macOS / Windows 11
- **JDK Version:** 21
- **Database:** MySQL 8.0
- **Dependencies:** Java Swing UI, FlatLaf, MigLayout, JFreeChart, JBCrypt, LGoodDatePicker, MySQL Connector, HikariCP, OpenCSV, SLF4J API, Typesafe Config, JUnit 5, Mockito
- **Seed Data:** 1 Admin, 1 Instructor, 2 Students, sample courses and sections

## 2 Acceptance Tests

### 2.1 A. Login and Authentication

Test Case	Expected Outcome
Login with correct Admin credentials	Admin Dashboard opens
Login with correct Student credentials	Student Dashboard opens
Login with correct Instructor credentials	Instructor Dashboard opens
Login with incorrect password	Error: "Invalid username or password."
Attempt login with empty fields	Error: "Username and Password cannot be empty."

### 2.2 B. Student Module Tests

#### 2.2.1 1. Course Catalog

Catalog loads all active courses	List of sections displays with code, title, credits
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#### 2.2.2 2. Registrations

Register for empty section	Success message, student appears in enrollment table
Register for already full section	Error: "Section is full."
Register for same section twice	Error: "Already registered."
Drop a registered section before drop deadline	Success, record removed
Attempt to drop after deadline	Error: "Drop deadline has passed."
Attempt to register/drop during maintenance	Error: "System is in read-only mode."

### 2.2.3 3. Grades & Transcript

View My Grades list	Shows component-wise and final grades
Transcript download	CSV file downloaded with all completed courses
Final grade calculation	A+, A, B, C, D computed using grading scale
Attempt to download transcript during maintenance	Error: "System is in read-only mode."

## 2.3 C. Instructor Module Tests

### 2.3.1 1. Sections List

Instructor sees only own sections	Only assigned sections appear in list
Selecting a section loads Gradebook	Students appear with quiz/midsem/endsem inputs
Statistics panel displays averages	Numerical averages shown for components

### 2.3.2 2. Grade Entry

Enter grades for student	Scores saved and reflected immediately
Enter invalid score ( $<0$ )	Error: "Score must be positive."
Final grade auto-calculation	Uses instructor-defined grade scale thresholds
Attempt to calculate final grades during maintenance	Error: "System is in read-only mode."

## 2.4 D. Admin Module Tests

### 2.4.1 1. User Management

Create new Student user	Creates entry in auth_db and erp_db
Create Instructor user	Instructor profile stored in erp_db
Invalid role combination	Error displayed
Delete user	Removes from both databases
Attempt to create new user during maintenance	Error: "System is in read-only mode."

### 2.4.2 2. Course Management

Create new course	Appears in catalog and admin list
Create section with instructor	Instructor sees it on sidebar
Capacity validation	Error if capacity $\leq 1$
Attempt to create/edit courses or sections during maintenance	Error: "System is in read-only mode."

### 2.5 E. Maintenance Mode Tests

Enable Maintenance Mode	Yellow banner appears on all dashboards
Students cannot register or drop	Disabled, message shown
Instructors cannot edit grades	Disabled fields

## 3 Negative / Edge Case Tests

Register for non-existent section	Error: "Section not found."
Instructor tries grading another instructor's section	Error: "Access denied."
Admin creates duplicate course code	Error: "Course code already exists."
Entering non-numeric grades	Error message, validation holds
Entering grades while Maintenance ON	Inputs disabled, save blocked

## 4 Security Tests

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Passwords stored only as bcrypt hashes	Verified in <code>users_auth</code>
Switching dashboards via URL not possible	Only role-based dashboards open
Enrollment uniqueness	One student cannot register twice (unique constraint)
SQL injection attempts	Prepared statements prevent injection

## 5 UI/UX Tests

Dashboard loads without delay	All major views responsive
Tables scroll correctly	No overflow issues
Error dialogs show clear feedback	All operations give user-friendly messages
Dark mode contrast remains readable	Tested across components

## 6 Test Summary

This section presents a concise pass/fail summary of all major functional areas tested in the University ERP System. All tests were executed on the final integrated build. The table below provides a high-level overview of results.

Test Category	Status	Remarks
<b>Login &amp; Authentication</b>	<b>PASS</b>	All role-based logins verified; incorrect credentials handled correctly.
<b>Student – Course Catalog</b>	<b>PASS</b>	Catalog loads correctly; sections display as intended.
<b>Student – Course Registration</b>	<b>PASS</b>	Register, drop, capacity limits, and duplicate checks all working.
<b>Student – Grade View &amp; Transcript</b>	<b>PASS</b>	Component-wise grades, final grade, and transcript export functional.

<b>Test Category</b>	<b>Status</b>	<b>Remarks</b>
<b>Instructor – My Sections</b>	<b>PASS</b>	Sections load correctly from database; navigation works smoothly.
<b>Instructor – Enter Grades</b>	<b>PASS</b>	Grade entry, score validation, and final grade calculation verified.
<b>Instructor – Statistics View</b>	<b>PASS</b>	Averages calculated and displayed correctly in text format.
<b>Admin – User Management</b>	<b>PASS</b>	Admin can create/delete users; database sync verified.
<b>Admin – Course Creation &amp; Editing</b>	<b>PASS</b>	All course/section operations validated, including instructor assignment.
<b>Admin – System Settings</b>	<b>PASS</b>	Maintenance Mode, deadlines, semester settings all functional.
<b>Maintenance Mode Tests</b>	<b>PASS</b>	Locks student/instructor write operations while Admin retains control.
<b>Database Constraint Tests</b>	<b>PASS</b>	Unique keys, foreign keys, and validations working correctly.
<b>Negative Tests (Error Handling)</b>	<b>PASS</b>	Incorrect inputs, duplicates, and invalid scores trigger proper error messages.
<b>Security Tests</b>	<b>PASS</b>	Prepared statements, hashed passwords, and access restrictions verified.
<b>UI/UX Tests</b>	<b>PASS</b>	Layouts load correctly; dark theme consistent; scroll panels functional.