University ERP Test Plan

1. Introduction

This Test Plan defines the strategy, scope, test cases, and expected results for verifying the functionality, reliability, and security of the University ERP desktop application. The application includes Student, Instructor, and Admin workflows, and must satisfy role-based access rules and "Maintenance Mode" restrictions.

2. Seeded Accounts

- `a1:a1`
- `i1:i1`
- `s1:s1`
- `s2:s2`

3. Test Data (Seed DB)

Your seed data includes:

AuthDB

- 1 Admin
- 1 Instructor
- 2 Students

ERPDB

- Courses: CSE121, CSE201
- Instructors assigned appropriately
- Student "s1" enrolled in at least one section
- Student "s2" not enrolled

4. Test Scope

Testing covers:

- Login and authentication
- Student workflows
- Instructor workflows
- Admin workflows
- Role-based restrictions

- Maintenance mode behavior
- Security (password hashing, DB isolation)
- Data integrity (capacity checks, duplicates)
- UI/UX elements
- Performance sanity tests

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5. Acceptance Test Cases

5.1 Login Tests

ID	Test Case	Steps	Expected Result
L1	Wrong password rejected	Enter invalid password for s1	Error: "Incorrect username or password"
L2	Correct login opens correct dashboard	Login as i1	Instructor dashboard loads
L3	Role-based dashboard	Login as each role	Student/Instructor/Admin UI appears correctly
L4	Password hash only	Check AuthDB	Only hashed passwords exist

5.2 Student Tests

ID	Test Case	Steps	Expected Result
S1	View course catalog	Student → Catalog	Table loads (code/title/credits/capacity/instructor)
S2	Register for available section	Register for CSE121-2 with free seats	Success + added to My Registrations
S3	Duplicate registration	Try registering again	Error: "Already registered"
S4	Register in full section	Fill capacity manually -> try register	Error: "Section full"
S5	Drop before deadline	Drop section	Enrollment removed
S6	View grades	Student -> Grades	All components + final grade displayed
S7	Transcript export	Click Export CSV/PDF	File downloads/open successfully

5.3 Instructor Tests

ID	Test Case	Steps	Expected Result
I1	View only own sections	Login as `i1`	Only assigned sections visible
I2	Enter assessment scores	Select section -> Enter quiz/midterm/final	Data saved
I3	Compute final grade	Click Compute Final	Final grade appears using weighting rule
I4	Edit not-owned section	Try editing another instructor's section	Error: "Not your section"
I5	Export grade CSV (optional)	Click Export CSV	File downloads

5.4 Admin Tests

ID	Test Case	Steps	Expected Result
A1	Create new user	Add username + role	Appears in AuthDB
A2	Create course	Add course in UI	Course listed
A3	Create section	Add section with capacity/time	Section listed
A4	Assign instructor	Select instructor for section	Instructor assigned
A5	Maintenance ON	Toggle ON	Banner visible; students/instructors cannot modify data
A6	Maintenance OFF	Toggle OFF	Normal behavior restored

5.5 Maintenance Mode Tests

ID	Description	Steps	Expected Result
M1	Student attempts register	Maintenance ON -> try register	Blocked: "Maintenance is ON"
M2	Instructor attempts grade update	Maintenance ON -> enter marks	Blocked with message

M3	UI shows banner	Login while ON	Visible red/yellow banner
M4	Maintenance OFF restores writes	Turn OFF -> try actions	Writes now work

5.6 Security Tests

ID	Test	Steps	Expected
SE1	Real passwords not stored	Inspect AuthDB	Only bcrypt hashes
SE2	ERPDB contains no passwords	Inspect ERPDB	No password column
SE3	Access rule checks	Try unauthorized actions	Blocked with friendly message

5.7 Edge & Negative Tests

ID	Test Case	Steps	Expected Result
N1	Negative capacity	Create section with -10	Error: "Invalid capacity"
N2	Register after deadline	Set past deadline register	Disabled
N3	Student view another record	Try editing other student's enrollment	Not possible
N4	Instructor grading wrong section	Try grading foreign section	Not possible
N5	Duplicate enrollment prevention	Try inserting manually	Prevented at service layer

5.8 Performance Tests

ID	Test	Steps	Expected
P1	Catalog load speed	Load catalog (100+ rows)	< 2–3 seconds
P2	App startup	Run JAR	Starts without freezing

6. Pass/Fail Criteria

- A test **passes** if actual behavior matches expected result.

- A test **fails** if behavior deviates or error messages do not appear correctly.

Critical failures (e.g., login, registration, grade computation) must be fixed.

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7. Risks & Assumptions

Risks:

- DB connection errors
- Incorrect test data
- OS display variations

Assumptions:

- Testers use provided seed DB
- Testers use correct JDK version