

LMS Project Detailed SRS

1. Introduction

1.1 Purpose

This document provides the **Software Requirements Specification (SRS)** for the LMS platform, which aims to automate learning, content management, and assessments for students, instructors, and administrators.

1.2 Scope of the Product

- Platform: **Web-based Learning Management System (LMS)**
- Users: **Students, Instructors, Administrators**
- Features:
 - User registration & authentication
 - Course management (create, upload, enroll)
 - Assessments & grading
 - Reporting & progress tracking
 - Notifications & messaging system

1.3 Intended Audience

- Project Supervisor: Mam Sara Fareed
 - Developers: Frontend (**ReactJS**), Backend (**NodeJS/MongoDB**)
 - QA/Testers
 - Stakeholders (School/College Administrators)
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2. Overall Description

2.1 Product Perspective

- The LMS will be a standalone web application integrated with MongoDB for data storage and NodeJS/Express backend APIs.
- The web interface will be built with ReactJS, fully responsive for desktop and mobile devices.

2.2 User Classes

User Type	Description	Key Functionalities
Student	Learner who enrolls in courses	Enroll, view content, submit quizzes, track progress
Instructor	Educator who manages courses	Create course, upload content, grade students
Admin	System manager	Manage users, assign roles, monitor system, generate reports

2.3 Operating Environment

- OS: Windows
- Browser: Chrome
- Internet: Required

3. Use Case Diagrams

3.1 Student Use Case Diagram

Actors: Student

Actions: Login, Search Course, Enroll, View Content, Take Quiz, View Grades

Diagram Suggestion: LMS system in the center with Student actor linked to all actions.

3.2 Instructor/Admin Use Case Diagram

Actors: Instructor, Admin

Instructor Actions: Create Course, Upload Content, Grade Submissions

Admin Actions: Manage Users, Monitor System, Generate Reports

Diagram Suggestion: System in center with Instructor & Admin actors linked to respective actions.

4. Use Case Descriptions

UC-001: User Login (Student/Admin)

Field	Description
Use Case ID	UC-001
Actors	User (Student/Admin)
Description	Authenticate user credentials and provide access to the dashboard
Trigger	User clicks "Login"
Preconditions	User must be registered
Postconditions	User session is created, dashboard displayed
Normal Flow	User enters credentials → System validates → Redirect to dashboard
Alternative Flow	Forgot Password, Invalid Credentials, Account Locked
Business Rules	Max 5 failed login attempts → Account locked

UC-002: Course Enrollment

Field	Description
Use Case ID	UC-002
Actors	Student
Description	Enroll in a course and update the database
Trigger	Student clicks “Enroll” on selected course
Normal Flow	Student selects course → System checks availability → Enrollment recorded → Confirmation sent
Postconditions	Student added to course, progress tracking activated
Exceptions	Course full → Enrollment denied

UC-003: Submit Assignment/Quiz

Field	Description
Use Case ID	UC-003
Actors	Student
Description	Submit assessment and system automatically grades multiple-choice questions
Normal Flow	Student uploads submission → System validates → Score calculated → Feedback sent

5. Functional Requirements

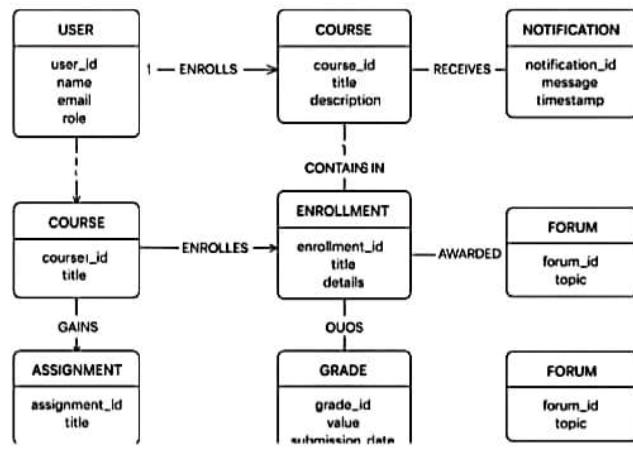
ID	Requirement	Rationale	Priority
FR-001	User Authentication	Secure login for students/admins	High
FR-002	Course Management	Instructor can create & upload courses	High
FR-003	Enrollment Tracking	Record student enrollment	High

FR-004	Content Delivery	Allow students to view course content	High
FR-005	Assessment Handling	Submit & auto-grade quizzes	High
FR-006	Reporting	Generate performance & course reports	Medium
FR-007	Notifications	Email/push notifications for updates	Medium

6. Non-Functional Requirements

Category	Requirement	Description
Performance	Response Time	System should respond within 2 seconds for content loading
Security	Data Encryption	Sensitive data stored with AES-256 encryption
Usability	Accessibility	WCAG 2.1 compliance, responsive UI
Maintainability	Modular Code	Code structured in components for easy updates
Reliability	Backup	Daily database backups, 99.5% uptime
Portability	Cross-Browser	Supports latest versions of Chrome, Firefox, Edge

Diagrams



1. Definitions, Acronyms, and Abbreviations

Term	Meaning
LMS	Learning Management System
UI	User Interface
API	Application Programming Interface
WCAG	Web Content Accessibility Guidelines

2. System Features

Expand each feature into sub-features:

- **User Registration & Authentication**
 - Password recovery, role-based access.
 - **Course Management**
 - Categorization of courses, prerequisites, versioning of content.
 - **Assessments & Grading**
 - Multiple types of quizzes, assignment submission, grade calculation.
 - **Progress Tracking**
 - Dashboard for students, instructor analytics.
 - **Notifications & Messaging**
 - Alerts for assignment deadlines, system messages.
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3. External Interface Requirements

- **User Interfaces**
 - Login page, Dashboard, Course page, Quiz page.
 - **Hardware Interfaces**
 - Optional: if mobile app integration.
 - **Software Interfaces**
 - Database (MongoDB), Backend APIs (NodeJS/Express), Frontend (ReactJS).
 - **Communication Interfaces**
 - Email, SMS, Push notifications.
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4. Data Flow Diagrams (DFD)

<ul style="list-style-type: none"> • Level 0: System overview.
<ul style="list-style-type: none"> • Level 1: Student actions (login → enroll → submit assignments → view grades).
<ul style="list-style-type: none"> • Level 1: Instructor/Admin actions (create course → upload content → grade → report generation).

5. Entity-Relationship Diagram (ERD)

- Entities: Student, Instructor, Admin, Course, Assignment, Quiz, Enrollment, Grade.
- Relationships: Student enrolls in Course, Instructor manages Course, Course has Assignments & Quizzes, etc.

6. Requirements Traceability Matrix (RTM)

Requirement ID	Description	Source	Status
FR-001	User Authentication	Stakeholder	Implemented
FR-002	Course Management	Stakeholder	Pending

7. Assumptions and Dependencies

- Users have internet access.
- System compatible with latest browsers.
- Database connection will remain stable.

8. Constraints

- System must comply with GDPR or local data protection laws.

- Mobile responsiveness mandatory.
 - Maximum concurrent users: 1000.
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