

Project Design Phase-II
Solution Requirements (Functional & Non-functional)

Date	10 Feb 2026
Team ID	LTVIP2026TMIDS64190
Project Name	LearnHub: Your Center for Skill Enhancement
Maximum Marks	4 Marks

Functional Requirements:

LearnHub must provide a secure and structured online learning environment that allows students, teachers, and administrators to interact efficiently. The system should support user registration and secure login using JWT-based authentication. It must provide role-based dashboards for Admin, Teacher, and Student users. Teachers should be able to create and upload video-based courses, while students should be able to browse courses, make payments (simulation), and enroll in selected courses.

The platform must track student progress by recording completed sections and restrict certificate access until the entire course is completed. It should generate downloadable PDF certificates upon successful completion. The system must also ensure payment verification before enrollment and maintain proper database relationships between users, courses, and enrollments. These features collectively ensure structured learning, secure access, and reliable course management.

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	Registration through form (Name, Email, Password, Role selection) Email uniqueness validation
FR-2	User Authentication	Secure login using email & password JWT token generation and validation
FR-3	Role-Based Access	Separate dashboards for Admin, Teacher, Student Middleware protection for restricted routes
FR-4	Course Management	Teacher can create course with title, description, category, price Video upload using Multer
FR-5	Course Enrollment	Student can enroll only after successful payment Payment simulation and verification
FR-6	Progress Tracking	Mark section as completed Track completed sections in database
FR-7	Certification	Generate downloadable PDF certificate using PDFKit
FR-8	Admin Control	Admin can view and delete courses

Non-functional Requirements:

Following are the non-functional requirements of the proposed solution.

FR No.	Non-Functional Requirement	Description
NFR-1	Usability	Responsive UI using React and Bootstrap, simple navigation, intuitive dashboards for different roles
NFR-2	Security	JWT-based authentication, bcrypt password hashing, role-based access control, protected API routes
NFR-3	Reliability	Stable backend architecture using Express, proper error handling and middleware validation
NFR-4	Performance	Optimized database queries, efficient API responses, smooth video playback
NFR-5	Availability	Deployable on cloud platforms, supports multiple concurrent users in scalable environment
NFR-6	Scalability	Modular MERN architecture allowing future integration of AI features, cloud storage, and mobile apps
NFR-7	Maintainability	Clean folder structure, reusable components, separated controllers and middleware
NFR-8	Data Integrity	MongoDB schema validation and relationship management using Mongoose