Project Design Phase-II

Date	**25 June 2025**
Team ID	**LTVIP2025TMID20425**
Project Name	**LearnHub: Your Center for Skill Enhancement**
Mentor Name	**Dr Shaik Salma Begam**
Maximum Marks	**4 Marks**

Technology Stack (Architecture & Stack)

Technical Architecture

Description: LearnHub is an online learning platform designed to deliver skill-based courses through a scalable, secure, and user-friendly web application. It supports learner registration, course browsing, enrollment, progress tracking, and admin management. The architecture follows a **3-tier model** with microservices for scalability and cloud deployment for high availability.

You can include a diagram showing:

- Frontend (Web UI)
- Backend Services (Course Management, User Auth, Progress Tracking)
- Database Layer (Cloud DB + Local Storage)
- External APIs (e.g., Certification, Aadhar Verification)
- ML Model (Personalized Course Recommendations)

Table 1: Technology Stack Components

S.No	Component	Description	Technology Used
1	User Interface	Web interface for learners and admins	HTML, CSS, JavaScript, React.js
2	Application Logic-1	Learner registration, login, course browsing	Python (Flask/Django)
3	Application Logic-2	Speech-to-text for accessibility	IBM Watson STT
4	Application Logic-3	Chatbot for learner support and FAQs	IBM Watson Assistant
5	Database	Stores user data, course content, progress tracking	MySQL, MongoDB

6	Cloud Database	Scalable cloud-based storage for course materials and user data	IBM Cloudant, Firebase
7	File Storage	Stores course videos, PDFs, certificates	IBM Block Storage, AWS S3
8	External API-1	Weather API for scheduling outdoor workshops	IBM Weather API
9	External API-2	Identity verification for certification	Aadhar API
10	Machine Learning Model	Personalized course recommendation engine	TensorFlow, Scikit-learn
11	Infrastructure	Deployment on cloud with container orchestration	Kubernetes, Docker, IBM Cloud Foundry

Table 2: Application Characteristics

S.No	Characteristic	Description	Technology Used
1	Open-Source Frameworks	Frameworks used for development	React.js, Flask, Django
2	Security Implementations	User authentication, data encryption, secure APIs	SHA-256, OAuth 2.0, IAM, HTTPS, OWASP
3	Scalable Architecture	Microservices architecture with containerization	Docker, Kubernetes
4	Availability	Load balancing and distributed servers for uptime	NGINX, IBM Cloud Load Balancer
5	Performance	Caching, CDN, optimized queries, async processing	Redis, Cloudflare CDN, Indexed DB