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

Date	19 February 2026
Team ID	LTVIP2026TMIDS75186
Project Name	Rising Waters: A Machine Learning Approach to Flood Prediction
Maximum Marks	4 Marks

Functional Requirements:

Following are the functional requirements of the proposed solution.

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	Data Collection & Input Validation	Accept rainfall, river level, temperature, humidity data and validate missing/invalid values.
FR-2	Flood Risk Prediction	Classify region as Low / Medium / High flood risk using ML model.
FR-3	Data Preprocessing	Handle missing values, normalize features, generate time-series features (rainfall intensity, water level rise rate).
FR-4	Model Inference	Load trained model and return flood probability score.
FR-5	Alert & Notification System	Trigger SMS/Email alerts when flood risk exceeds defined threshold.
FR-6	Dashboard & Reporting	Display district-wise flood risk levels, rainfall trends, and historical data.

Non-functional Requirements:

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

NFR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	**Provide simple and clear dashboard with easy-to-understand flood risk levels.**
NFR-2	**Security**	**Secure APIs, authenticated access for authorities, protected data storage.**
NFR-3	**Reliability**	**Ensure consistent preprocessing and prediction using saved model artifacts.**
NFR-4	**Performance**	**Deliver near real-time predictions (within a few seconds per request).**
NFR-5	**Availability**	**System should operate continuously during monsoon season.**

NFR-6	**Scalability**	**Handle multiple districts and large environmental datasets efficiently.**
NFR-7	**Maintainability**	**Modular architecture allowing easy updates and model retraining.**
NFR-8	**Portability**	**Support deployment on local servers, cloud platforms, and Docker containers.**