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

Date	18 February 2026
Team ID	LTVIP2026TMIDS84143
Project Name	Electric Motor Temperature Prediction using Machine Learning
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	Motor Parameter Input	User can enter ambient temperature User can enter coolant temperature User can enter voltage values (u_d, u_q) User can enter motor speed User can enter current values (i_d, i_q) User can enter torque
FR-2	Data Validation	System validates numeric input fields System prevents empty submissions System displays error messages for invalid inputs
FR-3	Temperature Prediction	System preprocesses input data using scaler System loads trained ML model (.save file) System predicts permanent magnet temperature
FR-4	Result Display	System displays predicted PM temperature to user System highlights overheating condition if threshold exceeded
FR-5	Model Training (Admin/Developer)	System trains ML model using dataset System evaluates model performance (R^2, MAE, MSE) System saves trained model for deployment
FR-6	Web Interface	System provides user-friendly Flask web interface System allows user to submit form and receive output instantly

Non-functional Requirements:

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

FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	The system shall provide a simple and intuitive web interface for entering motor parameters and viewing predictions.

NFR-2	**Security**	The system shall ensure safe handling of input data and prevent invalid or malicious input submission.
NFR-3	**Reliability**	The system shall generate consistent and accurate predictions based on the trained model.
NFR-4	**Performance**	The system shall generate prediction results within 2–3 seconds after input submission.
NFR-5	**Availability**	The web application shall be accessible whenever the server is running without downtime during normal operation.
NFR-6	**Scalability**	The system shall support integration with real-time sensor data and handle multiple prediction requests if expanded in future.