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

Date	10 February 2026
Team ID	LTVIP2026TMIDS90282
Project Name	Weather-Based Prediction of Wind Turbine Energy Output: A Next-Generation Approach to Renewable Energy Management
Maximum Marks	

Pre requisites:

To complete this project, you must required following software's, concepts and packages

- **Anaconda navigator and pycharm:**
- o Refer the link below to download anaconda navigator
- o Link : https://youtu.be/1ra4zH2G4o0

  - **To build Machine learning models you must require the following packages**

    - o **Sklearn:** Scikit-learn is a library in Python that provides many unsupervised and supervised learning algorithms.

    - o **NumPy:** NumPy is a Python package that stands for 'Numerical Python'. It is the core library for scientific computing, which contains a powerful n-dimensional array object

    - o **Pandas:** pandas is a fast, powerful, flexible, and easy to use open-source data analysis and manipulation tool, built on top of the Python programming language.

    - o **Matplotlib:** It provides an object-oriented API for embedding plots into applications using general-purpose GUI toolkits

    - o **Flask:** Web framework used for building Web applications.

    - o Watch the video below to learn how to install packages.

  - **Python packages:**
  - o Open anaconda prompt as administrator
  - o Type "pip install numpy" and click enter.
  - o Type "pip install pandas" and click enter.
  - o Type "pip install scikit-learn" and click enter.
  - o Type "pip install matplotlib" and click enter.
  - o Type "pip install scipy" and click enter.
  - o Type "pip install pickle-mixin" and click enter.
  - o Type "pip install seaborn" and click enter.
  - o Type "pip install Flask" and click enter.

Prior Knowledge:

You must have prior knowledge of following topics to complete this project.

- **ML Concepts**
  o Supervised learning: https://www.javatpoint.com/supervised-machine-learning
  o Unsupervised learning: https://www.javatpoint.com/unsupervised-machine-learning
  o Regression and classification
  o Decision tree: https://www.javatpoint.com/machine-learning-decision-tree-classification-algorithm
  o Random forest: https://www.javatpoint.com/machine-learning-random-forest-algorithm
  o KNN: https://www.javatpoint.com/k-nearest-neighbor-algorithm-for-machine-learning
  o Xgboost: https://www.analyticsvidhya.com/blog/2018/09/an-end-to-end-guide-to-understand-the-math-behind-xgboost/
  o Evaluation metrics: https://www.analyticsvidhya.com/blog/2019/08/11-important-model-evaluation-error-metrics/
- **Flask Basics** : https://www.youtube.com/watch?v=lj4I_CvBnt0