DEPARTMENT OF APEX INSTITUTE OF TECHNOLOGY

# PROJECT PROPOSAL

## 1. Project Title: -

**Big Data Analytics for Predictive Maintenance**

## 2. Project Scope: -

The scope of the "Big Data Analytics for Predictive Maintenance" project encompasses several critical areas. First, the project will involve the collection of both historical and real-time data from various sources, including equipment sensors, maintenance logs, and operational records. This data will be directly related to equipment performance, environmental conditions, failure occurrences, and maintenance activities. Next, the project will focus on data pre-processing and integration, where the collected data will be cleaned, normalized, and integrated into a unified format suitable for analysis. This process will involve noise reduction, handling missing data, and extracting relevant features that contribute to the predictive models.

The core of the project will involve the development and training of machine learning models capable of accurately predicting equipment failures. This will include selecting appropriate models, tuning their parameters, mainly focusing on using LSTM for predictive maintenance and validating their accuracy against historical data. Once the models are developed, they will be integrated into the existing maintenance management systems, enabling automated predictions and proactive maintenance scheduling. The project will also include a pilot phase to test the system's effectiveness in a real-world setting, followed by full-scale deployment across all relevant equipment. Finally, the project will involve continuous monitoring and optimization of the predictive maintenance system to ensure its ongoing accuracy and efficiency, as well as documentation and reporting to capture all processes, results, and lessons learned.

## 3. Requirements: -

* **Hardware Requirements**

1. Sensors:

* Vibration sensors, temperature sensors, pressure sensors
* **Software Requirements**

1. Data Management: MySQL.
2. Machine Learning: Python,TensorFlow,PyTorch
3. Data Visualizaiton: Matplotlib or Power BI
4. Version control: Git,GitHub
5. **STUDENTS DETAILS**

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| --- | --- | --- |
| **Name** | **UID** | **Signature** |
| Keshav | 21BCS5372 |  |

**APPROVAL AND AUTHORITY TO PROCEED**

We approve the project as described above, and authorize the team to proceed.

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| **Name** | **Title** | **Signature**  **(With Date)** |
| Mr. Nirmalya Basu |  |  |