

# **CROP AND FERTILIZER RECOMMENDATION SYSTEM USING MACHINE LEARNING**

**B.E. PROJECT REPORT (Phase-1)**

Submitted to Kaviyitri Bahinabai Chaudhari North Maharashtra University, Jalgaon  
in Partial Fulfillment of the Requirements for the Degree of  
**BACHELOR OF TECHNOLOGY**  
in Computer Engineering.

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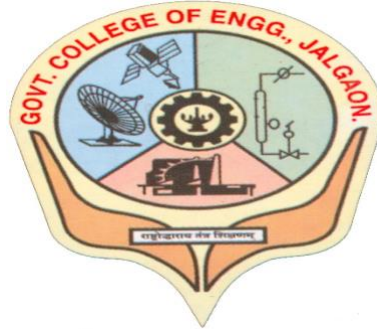
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**CERTIFICATE**



This is to certify that the Project(CO411U Phase-1) entitled, **“Crop and Fertilizer Recommendation System Using Machine Learning”**, which is being submitted herewith for the award of Bachelor of Engineering in Computer Engineering, is the result of the work completed by **Mahesh Dinesh Patil, Prathamesh Vijay Sarode, Bhagyashri Bhagwan Patil, Bhushan Prakash Jain** under my supervision and guidance within the four walls of the institute and the same has not been submitted elsewhere for the award of any degree.

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## **DECLARATION**

We hereby declare that the Project (CO411U Phase-1) entitled, “**Crop and Fertilizer Recommendation System Using Machine Learning**” was carried out and written by us under the guidance of Mrs. K.R. Sarode, Professor of Computer Engineering Department, Govt. College of Engineering, Jalgaon. This work has not been previously formed the basis for the award of any degree or diploma or certificate nor has been submitted elsewhere for the award of any degree or diploma.

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## **ABSTRACT**

This project aims to optimize agricultural productivity by developing a machine learning-based crop and fertilizer recommendation system. It evaluates various algorithms—Naive Bayes, Random Forest and Neural Networks against metrics like precision, recall, F1-score, and accuracy. The initial phase involved exploratory data analysis and feature scaling to standardize the dataset. Naive Bayes and Random Forest exhibited exceptional performance, its suitability for datasets with independent features. Advanced models were also assessed to capture complex patterns. Confusion matrices were used to fine-tune predictions, guiding improvements for misclassified instances. The project underscores the importance of selecting an appropriate model based on the dataset's nuances and cross-validation to ensure model reliability. Finally, a Flask application was created as an interface, allowing for seamless interaction with the model's recommendations.

**Keywords:** Accuracy, Confusion Matrices, Flask, F1-score, Naive Bayes, Neural Networks, Precision, Random Forest.

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