# VISVESVARAYA TECHNOLOGICAL UNIVERSITY,

# BELAGAVI-590018

## Mini Project Report On

## "IOT Based Soil Moisture Detection"

**A report submitted in partial fulfilment of the requirements for**

**MINI PROJECT**

**In**

**Computer Science and Engineering (IOT , Cyber Security including Blockchain Technology)**

**Submitted by**


| | |
|---|---|
| SHRADDHA | **4AL22IC042** |
| SHREYA RAO | **4AL22IC043** |
| SHRINIDHI M HEGDE | **4AL22IC044** |
| SIDDHARTH NAIK | **4AL22IC045** |


**Under the Guidance of**

**Ms. B S Sumukha**

**Teaching Assistant**

ALVA'S
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**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (IOT , CYBER SECURITY INCLUDING BLOCKCHAIN TECHNOLOGY)**

**ALVA'S INSTITUTE OF ENGINEERING AND TECHNOLOGY**

**MOODBIDRI-574225, KARNATAKA**

**2023 – 2024**

# ALVA'S INSTITUTE OF ENGINEERING AND TECHNOLOGY

**MIJAR, MOODBIDRI, D.K. - 574225**

ALVA'S
Education Foundation®

## DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING (IOT , CYBER SECURITY INCLUDING BLOCKCHAIN TECHNOLOGY)

## CERTIFICATE

This is to certify that the Project entitled **"IOT Based Soil Moisture Detection"** has been completed by

SHRADDHA 4AL22IC042 SHREYA RAO 4AL22IC043

SHRINIDHI M HEGDE 4AL22IC044 SIDDHARTH NAIK 4AL22IC063

the bonafide students of **Department of Computer Science & Engineering (IOT , Cyber Security including Blockchain Technology ), Alva's Institute of Engineering and Technology** in **DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING (IOT , CYBER SECURITY INCLUDING BLOCKCHAIN TECHNOLOGY)** of the **VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI, from 2023 to** 2024. It is certified that all corrections/suggestions indicated for Internal Assessment have been incorporated in the report deposited in the departmental library. The project report has been approved as it satisfies the academic requirements concerning the project work prescribed for the Bachelor of Engineering Degree.

**Ms. B S Sumukha**
**Project Guide**

**Dr. Pradeep V**
**HOD CSE(ISE/ICB)**

H.O.D.
Dept. Of Information Science & Engineering
Alva's Institute of Engg. & Technology
Mijar, MOODBIDRI - 574 225

# ABSTRACT

The proposed IoT-based soil moisture detection system aims to address key challenges faced by farmers in monitoring and managing soil health and irrigation. By using a soil moisture sensor, the system can indirectly measure soil water content by tracking changes in electrical resistance or capacitance, which correlates with moisture levels. This data is transmitted to the cloud via the ESP8266 Wi-Fi module, enabling farmers to remotely monitor soil conditions in real-time through mobile apps or web platforms.

The system can be seamlessly integrated with automated irrigation solutions, leveraging precise moisture readings to activate irrigation only when necessary. This minimizes water wastage, reduces over-irrigation risks, and ensures optimal soil hydration for plant growth. Additionally, historical data collected by the system can be analyzed to identify patterns and trends, helping farmers optimize irrigation schedules, plan crop cycles, and predict the impact of varying weather conditions on soil moisture.

Enhanced by low-power operation and modular design, the system is scalable and adaptable to farms of varying sizes. It can support integration with additional sensors, such as temperature, humidity, and pH sensors, providing a comprehensive picture of soil health and environmental factors. Alerts and notifications for extreme conditions, such as drought or excessive moisture, further empower farmers to act swiftly and efficiently.

This IoT solution also contributes to the broader goals of smart agriculture by enabling data-driven decision-making, reducing resource consumption, and promoting sustainable farming practices. Its low-cost design makes it accessible to small-scale farmers, bridging the gap between traditional agricultural methods and modern technology. With continuous monitoring, automated control, and data analytics, the system enhances farm productivity, reduces operational costs, and aligns with global efforts toward environmental sustainability and food security.