MSA University - Faculty of Engineering
(Engineering - Mechatronics Systems Engineering Department)
(Sensors, Measurements and Data Acquisition System–MSE252) – Fall 2025
Supervised by: Assoc. Prof. Mohamed Atef Ismail - TA. Ziena Mahmoud

# Smart Irrigation System

## Abstract

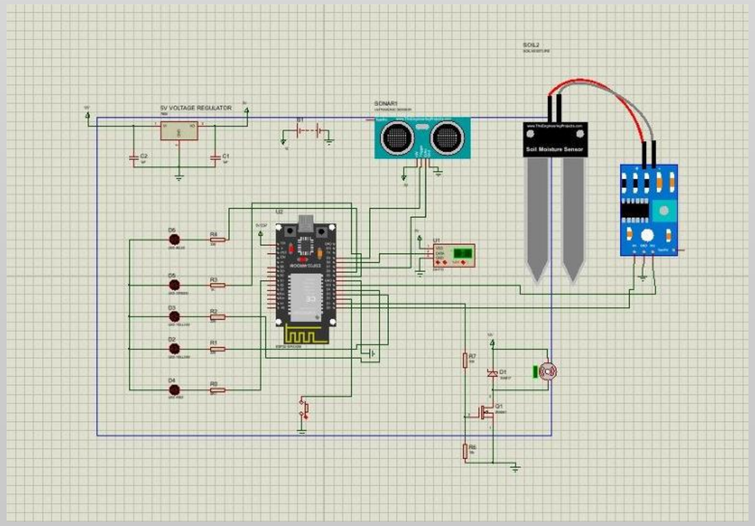
This project represents the smart irrigation system utilizing IoT technology that monitors environmental factors and waters plants effectively. By incorporating sensors that sense soil moisture, temperatures, levels, and rainfall in the area, it allows plants to be supplied with the required amount of irrigation at the correct time. Using an ESP32 microcontroller with the help of GUI support, it analyzes data, makes appropriate decisions, and allows interaction between users. Future development may include sensors that measure illumination, soil pH, humidity levels, and an intelligent camera that captures growth development in plants using artificial intelligence technology. Research indicates that with the implementation of these IoT irrigation systems.

## Project Image

## Components

Water storage unit
Pumping system
Flow control mechanism
Mechanical Housing
Structural Support
ESP-32 Microcontroller Unit
Soil Moisture Sensor
Temperature & Humidity Sensor
HCSR04 Ultrasonic Sensor
Yl-83 Rain Detector
Relay Module
Battery
Jumper wire

## Circuit Diagram




## Participants

**Abdulrahman Ahmed Khairy 249915**

**Ali Abdelelah Ali 244093**

**Khaled Diaa Eldin Mohamed 247181**

**Joudy Ahmed Mohamed 245133**

**Seifeldin Eslam Abbas 249437**

## QR Code