# AHSANULLAH UNIVERSITY OF SCIENCE & TECHNOLOGY


**DEPARTMENT OF ELECTRICAL & ELECTRONIC ENGINEERING**

(2nd year 2nd semester)

## Project Proposal on Measurements and Instrumentation
## (Soil Moisture Measurement)

**COURSE NO:**EEE-2211

**COURSE TITLE:** Measurement and Instrumentation

**SUBMITTED BY:**

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**Objective:**

Objective of our project is to measure the moisture of the soil, using gypsum bar.

**Equipment:**

1. Gypsum bar----------1/2 piece
2. Electrode----------2piece
3. Resistances---------- 6 piece (10meg), 4piece (100k)
4. Ic lm339----------1 piece
5. LED----------4piece
6. Power supply----------5v and 9V
7. Wires
8. Soil
9. Water

**Circuit diagram:**

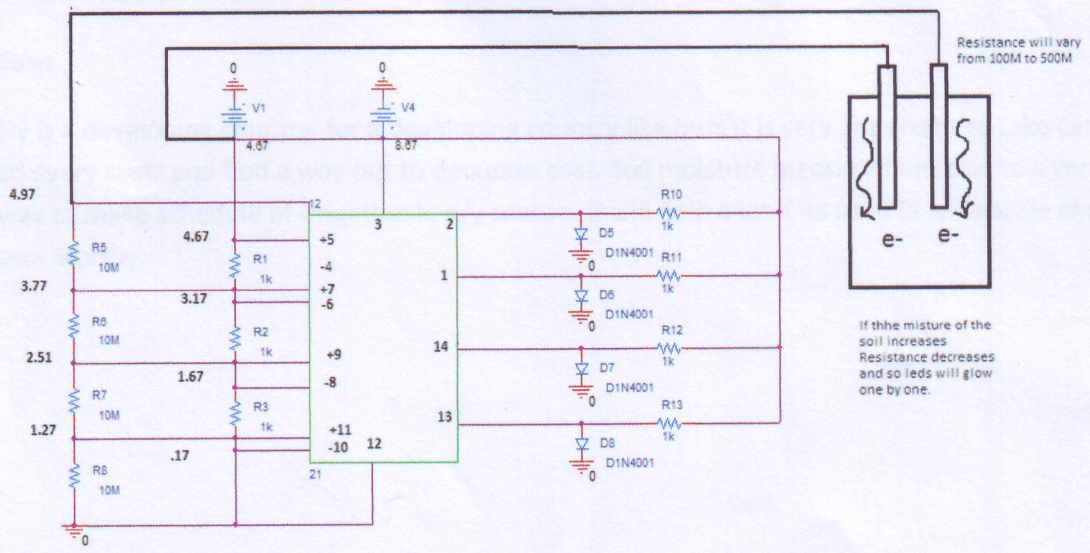


Figure 1: soil moisture measurement by Gypsum Bar

**Working Procedure:**

1. Set the circuit up as shown in the circuit diagram
2. Now pour some water in the soil
3. Take the resistance reading between the electrode
4. Find out the comparing voltages and see if the LEDs are glowing or not

**Working principal:**

As we know Gypsum ($CaSo_4.2H_2O$), is very water sensitive material. It becomes solid when it is mixed with water and absorbs water if more water is mixed. Here we have used this characteristic of Gypsum. if gypsum is dry it has infinite resistance and if it is wet resistance decreases. When soil is moistured then current will flow through this and the LEDs will glow one by one depending on the voltages across the comparing pins of the Ic.

If all Leds are glowing that means that soil is moisture enough and if not then we consider the soil to be dry.

**Usefulness:**

1. It is a very easy procedure of measuring the moisture of the soil.
2. In our country we need to irrigate in dry season to grow crops. But sometimes it is seen that soil is dry on surface but internally moisture enough for cultivation. In this condition if we irrigate the soil it's a kind of loss. But trough this experiment we can find out internal moisture of the soil.
3. This experiment will also help us to maintain consistent moisture level.

**Discussion:**

Our country is a developing country, for a developing country like ours it is very important to take care of each and every costs and find a way out to decrease cost. Soil moisture measurement can be a very effective way to make schedule of irrigation in dry season. It will help a lot if its used in wide scale and not even cost worthy.