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**FACULTY OF ENGINEERING**

**FACULTY OF ENGINEERING AND TECHNOLOGY DEPARTMENT OF  
ELECTRICAL ENGINEERING**

**FINAL YEAR PROJECT REPORT A SMART RAINWATER HARVESTING CONTROL  
AND TREATMENT SYSTEM FOR SAFE DRINKING WATER.**

**BY**

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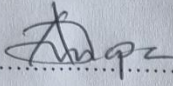
*A final year Project report submitted to the Department of Electrical Engineering in Partial fulfillment of the Requirement for the award of a Diploma in Electronics and Electrical Engineering of Busitema University.*

**MAY, 2025**

# **DECLARATION**

I, the undersigned, declare that this report is my original work except where due acknowledgement has been made. I declare that this work has never been submitted to this university or any other institute of learning for partial fulfillment for any award.

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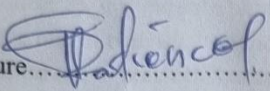
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## APPROVAL

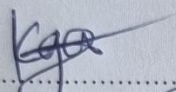
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## **ABSTRACT**

This project presents the development of a smart rainwater harvesting system integrated with real-time control and water treatment mechanism to ensure safe drinking water. The system employs water level switches to monitor the collected rainwater. An Arduino Uno microcontroller-based unit processes sensor data, water and storage functions based on set parameters. A prototype was developed using Arduino Uno microcontroller advanced technology. This prototype was able to automatically operate and the project objectives were met as indicated by the outcomes as demonstrated in the report.

## **DEDICATION**

I dedicate this report to my beloved parents, siblings, and friends.

## **LIST OF ACRONYMS**

|         |                                                     |
|---------|-----------------------------------------------------|
| CPU:    | Central Processing Unit                             |
| RAM:    | Random Access Memory                                |
| RISC:   | Reduced instruction Set Computer                    |
| ROM:    | Read Only Memory                                    |
| SPI:    | Serial Peripheral Interface                         |
| Km:     | Kilometer                                           |
| %:      | Percent                                             |
| MWE:    | Ministry of Water and Environment                   |
| RWH:    | Rainwater harvesting                                |
| UV:     | Ultra violet                                        |
| IoT:    | Internet of things                                  |
| MSNs:   | Mobile sensor networks                              |
| IDE:    | Integrated Development Environment                  |
| EEPROM: | Electrically Erasable Programmable Read-Only Memory |
| UART:   | Universal Asynchronous Receiver Transmitter         |
| I/O:    | Input out                                           |
| KB:     | Kilobyte                                            |
| MHz:    | Megahertz                                           |
| DC:     | Direct current                                      |
| AC:     | Alternating current                                 |

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