



**GARBAGE MONITORING SYSTEM USING  
CLOUD COMPUTING**

**A PROJECT REPORT**

*Submitted by*

<b>SURUTHI V</b>	<b>(112818105009)</b>
<b>SWATHI V</b>	<b>(112818105010)</b>
<b>ASHOK KUMAR P</b>	<b>(112818105301)</b>
<b>THIRUMALAI B</b>	<b>(112818105303)</b>

*In partial fulfillment for the award of the degree*

*Of*

**BACHELOR OF ENGINEERING**

*In*

**ELECTRICAL AND ELECTRONICS ENGINEERING**

**T. J. S. ENGINEERING COLLEGE, PERUVOYAL**

**ANNA UNIVERSITY: CHENNAI 600 025**

**JUNE 2022**

**PRINCIPAL**

**T.J.S. ENGINEERING COLLEGE**  
Peruvoyal, Kavaraipettai,  
Gummidipoondi Taluk,  
Thiruvallur Dist - 601 206.



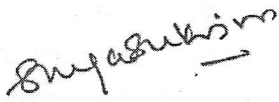
ANNA UNIVERSITY: CHENNAI 600 025

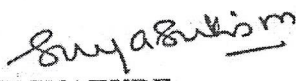
BONAFIDE CERTIFICATE

Certified that this project report "GARBAGE MONITERING SYSTEM USING CLOUD COMPUTING" is the Bonafide work of the following students.

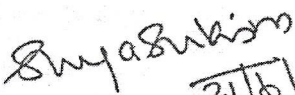
SURUTHI V	(112818105009)
SWATHI V	(112818105010)
ASHOK KUMAR P	(112818105301)
THIRUMALAI B	(112818105303)

Who carried out the project work under my supervision.


  
SIGNATURE  
Mrs. M.SHUNMUGA SANKARI, M.E.,  
Associate Professor  
HEAD OF THE DEPARTMENT  
Department of Electrical and  
Electronics Engineering  
T.J.S. Engineering College  
Peruvoyal.

  
SIGNATURE  
Mrs.M.SHUNMUGA SANKARI, M.E.,  
Associate Professor  
SUPERVISOR  
Department of Electrical and  
Electronics Engineering  
T.J.S. Engineering College  
Peruvoyal.

Submitted for Viva – Voce held on 21.06.2022 at T.J.S. Engineering College  
Peruvoyal.

  
21/6/22  
INTERNAL EXAMINER

  
21/06/22  
EXTERNAL EXAMINER

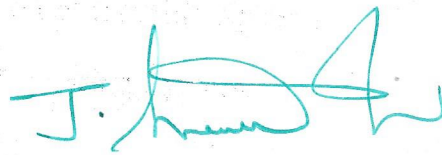


PRINCIPAL  
T.J.S. ENGINEERING COLLEGE  
Peruvoyal, Kavaraipettai,  
Gummidipoondi Taluk,  
Thiruvallur Dist - 601 206.



## ABSTRACT

This Project presents a methodology for implementation of a smart garbage monitoring for a smart cities with various types of sensors. This project increases the data transfer about the bin status by using Internet of things. The bin designed with sensors and separate the wastes by this the environment around the street will be Clean and reduces the pollution. Under smart city schemes our government has invoked some ideas about smart garbage waste disposals. Servo motors placed with Infrared sensors and controller board will help the people and people who clean the waste in bin has no contact with the bin because of IR sensor which sense the action and open, close the garbage bin's door. Here by using inductive proximity sensor and capacitive proximity sensor it can segregate the solid and metal wastes and also vegetable wastes. Flammable gas sensor which senses the methane gas, CO<sub>2</sub> gas etc. Hence we can reduce the pollution and keep our environment clean.



PRINCIPAL  
T.J.S. ENGINEERING COLLEGE  
Peruvoyal, Kavaraipeetai,  
Gummidipoondi Taluk,  
Thiruvallur Dist - 601 206.





EE8691

EMBEDDED SYSTEMS

L T P C  
3 0 0 3

**OBJECTIVES:**

To impart knowledge on the following Topics

~~Building Blocks of Embedded System~~

- Various Embedded Development Strategies
- Bus Communication in processors, Input/output interfacing.
- Various processor scheduling algorithms.
- Basics of Real time operating system and example tutorials to discuss on one real time operating system tool.

**UNIT I INTRODUCTION TO EMBEDDED SYSTEMS**

Introduction to Embedded Systems -Structural units in Embedded processor , selection of processor & memory devices- DMA - Memory management methods- Timer and Counting devices, Watchdog Timer, Real Time Clock, In circuit emulator, Target Hardware Debugging. 9

**UNIT II EMBEDDED NETWORKING**

Embedded Networking: Introduction, I/O Device Ports & Buses- Serial Bus communication protocols RS232 standard - RS422 - RS 485 - CAN Bus Serial Peripheral Interface (SPI) - Inter Integrated Circuits (I<sup>2</sup>C) -need for device drivers. 9

**UNIT III EMBEDDED FIRMWARE DEVELOPMENT ENVIRONMENT**

Embedded Product Development Life Cycle- objectives, different phases of EDLC, Modelling of EDLC; issues in Hardware-software Co-design, Data Flow Graph, state machine model, Sequential Program Model, concurrent Model, object oriented Model. 9

**UNIT IV RTOS BASED EMBEDDED SYSTEM DESIGN**

Introduction to basic concepts of RTOS- Task, process & threads, interrupt routines in RTOS, Multiprocessing and Multitasking, Preemptive and non-preemptive scheduling, Task communication shared memory, message passing-, Inter process Communication - synchronization between processes-semaphores, Mailbox, pipes, priority inversion, priority inheritance. 9

**UNIT V EMBEDDED SYSTEM APPLICATION AND DEVELOPMENT**

Case Study of Washing Machine- Automotive Application- Smart card System Application- ATM machine -Digital camera 9

**TOTAL : 45 PERIODS**



*J. [Signature]*  
**PRINCIPAL**  
**T.J.S. ENGINEERING COLLEGE**  
Peruvoyal, Kavaraipeetai,  
Gummidipoondi Taluk,  
Thiruvallur Dist - 601 206.