

**A  
MAJOR PROJECT REPORT  
ON**

**“ IOT BASED PATIENT HEALTH  
MONITORING SYSTEM”**

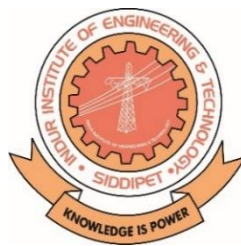
**Submitted in Partial Fulfillment of the Requirement for the award  
of the degree of**

**BACHELOR OF TECHNOLOGY  
IN  
ELECTRONICS AND COMMUNICATION ENGINEERING**

**SUBMITTED BY**

**K. ROHITH**

**20D31A0416**



**Under the guidance of**

**Mrs. P. RENUKA**

*Associate Professor*

**DEPARTMENT OF  
ELECTRONICS AND COMMUNICATION ENGINEERING  
INDUR INSTITUTE OF ENGINEERING & TECHNOLOGY**

**Ponnala (V), Siddipet (Dist.) – 502 277, Telangana.**

**2023-2024**

**INDUR****INSTITUTE OF ENGINEERING & TECHNOLOGY****(Approved by AICTE & Affiliated to JNTUH)****SIDDIPET** (Dist.) - 502 277, Telangana, India.

Ph : 08457 - 230526, Fax : 08457 - 231409.

Web Site : [www.induriet.edu.in](http://www.induriet.edu.in)

**Department of  
Electronics and Communication Engineering**

**CERTIFICATE**

This is to certify that the project entitled “ **IOT BASED PATIENT HEALTH MONITORING SYSTEM** ” is a bonafide work done and submitted by

**K. ROHITH**

**20D31A0416**

In partial fulfillment of the requirement for the degree of B.TECH in the Department of **ELECTRONICS AND COMMUNICATION ENGINEERING** from **INDUR INSTITUTE OF ENGINEERING & TECHNOLOGY**, SIDDIPET (Affiliated to JNTU Hyderabad) during the academic year 2023-2024 is a record of bonafide work carried out under the guidance of **Mrs. P. RENUKA** Associate Professor.

**Project Guide**

**Mrs. P. RENUKA**

**Associate Professor**

**Head of ECE Department**

**Dr. G. MALLESHAM**

**Professor**

**External Examiner**

## DECLARATION

I hereby declared that the work reported in the present project entitled **“IOT BASED PATIENT HEALTH MONITORING SYSTEM”** is a record of work done by me under the guidance of **Mrs. P. RENUKA Associate Professor**, Department of Electronics and Communication Engineering, Indur Institute of Engineering and Technology, Siddipet.

No part of this is copied from books/journals/internet and wherever the portion has been taken the same has been duly referred in the text. The reports are based on the project work done entirely by me and not copied from any other.

**Name of the Student**

**Roll No.**

K. ROHITH

20D31A0416

DATE:

PLACE: SIDDIPET

# ACKNOWLEDGEMENT

The satisfaction that accompanies the successful completion of any task would be incomplete without the mention of the people who made it possible and whose encouragement and guidance has been a source of inspiration throughout the course of the project.

It is my privilege and pleasure to express my profound sense of gratitude and indebtedness to my project guide **Mrs. P. RENUKA, Associate Professor** of Electronics and Communication Engineering Department, Indur Institute of Engineering & Technology, for her guidance, cogent discussion, constructive criticisms and encouragement throughout this dissertation work.

I take the opportunity to offer my humble thanks to **Dr. G. MALLESHAM, Professor & Head of the Department**, Electronics and Communication Engineering, Indur Institute of Engineering & Technology, for his encouragement and constant help.

I also thank **Dr. V. P. RAJU, Principal**, Indur Institute of Engineering & Technology, for his support in this Endeavour.

In addition, I would like to thank all the **faculty members & Lab Staff** Department of Electronics and Communication Engineering, **Management**, who provided me with good lab facilities and helped me in carrying out the project successfully.

I finally thank my family members and friends for giving moral strength and support to complete this dissertation.

**Name of the Student**

K. ROHITH

**Roll No.**

20D31A0416

# ABSTRACT

In today's world health problems became a significant issue. Health related issues can't be controlled since they may ensue to the environmental changes, lifestyle changes or maybe heredity. So, we might get immediate help and can be rescued in time. The proposed system aims to watch the patients remotely by using IoT. This device monitors a person's heartbeat, temperature, respiration and speed of the motion and sends it to the cloud over the net with the help of Node MCU that has in-built WiFi. So, the person will be monitored anytime and anywhere around the globe.

Here the most sensors that are being employed are Heartbeat sensor to monitor the heartbeat of the patient, temperature sensor to observe the temperature and respiratory sensor to watch the breathing of the patient. The MEMS sensor is employed to detect the person's motion. These sensors are connected to the Arduino UNO as data input device and the output is shipped to the cloud platform getting used. The cloud platform being employed during this project is Thingspeak. It collects the information from the sensor and sends it to the cloud in order that the persons are often monitored remotely and if the patient has an emergency situation, the location of the patient is additionally sent to the person monitoring the patient in a message format.

**KEY WORDS:** IoT, Node MCU, WiFi, Heartbeat Sensor, Temperature Sensor, Respiratory Sensor, MEMS Sensor, Arduino UNO, Thingspeak.

# CONTENTS

<b>TITLE</b>	<b>PAGE NO</b>
<b>ACKNOWLEDGEMENT</b>	<b>i</b>
<b>ABSTRACT</b>	<b>ii</b>
<b>LIST OF FIGURES</b>	<b>v</b>
<b>LIST OF TABLES</b>	<b>vi</b>
<b>CHAPTER-1: INTRODUCTION</b>	<b>1-3</b>
1.1 Introduction	1
1.2 Aim of the Project	2
1.3 Significance of the work and Applications	2
<b>CHAPTER-2: LITERATURE SURVEY</b>	<b>4-6</b>
2.1 Literature Survey	4
2.2 Existing System	5
2.3 Proposed System	5
<b>CHAPTER-3: IMPLEMENTATION</b>	<b>7-10</b>
3.1 Block Diagram	7
3.2 Schematic diagram	8
3.3 Working Principle	9
<b>CHAPTER-4: HARDWARE DESCRIPTION</b>	<b>11-31</b>
4.1 Arduino UNO	11
4.1.1 Specifications and Features	14
4.2 Node MCU	15
4.2.1 Specifications and Features	16
4.3 MEMS Sensor	17
4.3.1 Specifications and Features	17
4.4 Heartbeat & Respiratory Sensor	18
4.4.1 Specifications and Features MAX30102	19
4.5 Temperature Sensor	19
4.5.1 Specifications and Features DHT11	19

4.6 GPS Module	20
4.6.1 Specifications and Features of GPS Module	21
4.7 GSM Module	21
4.7.1 Features of GSM	21
4.7.2 Specifications of GSM	22
4.8 LCD Display	23
4.8.1 Pin Configuration of LCD	24
4.8.2 Features of Liquid Crystal Display	24
4.8.3 Specifications of Liquid Crystal Display	25
4.8.4 Applications of LCD	25
4.9 Buzzer	26
4.9.1 Specifications and Features of Buzzer	26
4.10 Power Supply	27
4.10.1 Introduction	27
4.10.2 Transformer	27
4.10.3 Rectifier	28
4.10.4 Smoothing	29
4.10.5 Regulator	30
<b>CHAPTER – 5: SOFTWARE AND CODE</b>	<b>32-56</b>
5.1 Arduino IDE	32
5.1.1 About the Arduino IDE Tools	32
5.2 Software Code	37
<b>CHAPTER – 6: RESULTS</b>	<b>57-62</b>
6.1 OFF Condition	57
6.2 ON Condition	58
6.3 Advantages	62
6.4 Applications	62
<b>CHAPTER – 7: CONCLUSION AND FUTURE SCOPE</b>	<b>63</b>
7.1 Conclusion	63
7.2 Future Scope	63
<b>REFERENCES/ BIBLOGRAPHY</b>	<b>64</b>

# LIST OF FIGURES

<b>CONTENTS</b>	<b>Page No.</b>
Fig 3.1: Block Diagram	7
Fig 3.2: Schematic diagram	8
Fig 4.1: Arduino UNO	11
Fig 4.2: Pin Diagram	14
Fig 4.3: Node MCU	16
Fig 4.4: MEMS Sensor	17
Fig 4.5: MAX30102 Sensor	18
Fig 4.6: Temperature Sensor	20
Fig 4.7: GPS Module	20
Fig 4.8: GSM Module	22
Fig 4.9: Liquid Crystal Display(LCD)	23
Fig 4.10: Buzzer	26
Fig 4.11: Block Diagram of Regulated Power Supply System	27
Fig 4.12: Output Waveform of Transformer	28
Fig 4.13: Rectifier Circuit	29
Fig 4.14: Output of the Rectifier	29
Fig 4.15: Smoothing action of Capacitor	30
Fig 4.16: Waveform of the Rectified output smoothing	30
Fig 4.17: Regulator	31
Fig 4.18: Full Wave Bridge Rectifier	31
Fig 5.1: A to B Standard USB Cable	32
Fig 6.1: OFF Condition	57
Fig 6.2: ON Condition	58
Fig 6.3: Location	59
Fig 6.4: Alert Message	60
Fig 6.5: Heart Rate and Oxygen Levels	61
Fig 6.6: Temperature (*C)	61
Fig 6.7: High Temperature Alert (*C)	61



## **LIST OF TABLES**

<b>CONTENTS</b>	<b>Page No.</b>
Table-3.1: Pin configuration of LCD	24
Table-3.2: Specifications of LCD	25