



BUSITEMA UNIVERSITY
FACULTY OF ENGINEERING
DEPARTMENT OF COMPUTER ENGINEERING

**A SYSTEM TO MONITOR HB LEVELS IN SICKLE CELL
CHILDREN**

By

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May the almighty GOD JEHOVAH bless you richly and exceedingly!

Thanks.

DECLARATION

I, **NALWENGE MIRIAM**, hereby declare that this project is completely based on my research work except for citations and quotations which have been specifically acknowledged. It has not been submitted to any other examining body or academic institution for any academic award.

Signature:

.....

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APPROVAL

This Dissertation Report under the title “**A SYSTEM TO MONITOR HEMOGLOBIN LEVELS IN SICKLE CELL CHILDREN**” has been submitted with the approval of the following supervisor.

MR. ARINEITWE JOSHUA

Signature.....

Date.....

DEDICATION

I dedicate this project report to my lovely Father Mr. Bwire Stephen and Mother Mrs. Namiripo Annet.

I am very grateful for the support and endeavors you have done for me throughout my entire academic journey. May the Almighty richly reward you.

LIST OF ACRONYMS OR ABBREVIATIONS

Hb	Hemoglobin
HCS	Hemoglobin Color Scale
CBC	Complete Blood Count
GSM	Global System for Mobile Communications
NIS	Noninvasive Spectrophotometry
SLS	Sodium Lauryl Sulfate
LCD	Liquid Crystal Display
PCB	Printed Circuit Board

ABSTRACT

Sickle cell disease is the most common genetic blood disorder condition that affects the body's red blood cells. It occurs when a child receives two sickle cell genes one from each parent. Hemoglobin (Hb) is the protein molecule in red blood cells that carries oxygen from the lungs to the body tissues and returns the carbon dioxide from the tissues to the heart.

The main problem faced by children with sickle cell is low Hb levels which causes anemia in them. Anemia is a condition in which one lack enough healthy red blood cells to carry adequate oxygen to one's body tissues.

The system is used for monitoring the Hb levels in sickle cell children using the color sensors which detects color change in their urine, the heart beat sensor which measures their heart pulses and the sound sensor which detects the wheezing sound as the sickle cell child breathes. The data from the sensors is processed by the micro controller to get the Hb level monitored and then sent to the database containing different Hb levels and the corresponding remedies. It is from this point where the database is queried to send the corresponding remedies to the user's phone and the sensor readings to the system in the hospital.

This project is a true hope for sickle cell children because it monitors their Hb levels in real time and provides suitable remedies to be followed to boost the Hb level incase its low.

The work is arranged mainly in six chapters, Chapter one includes the introduction of a system that monitors Hb levels in sickle cell children. Chapter two discusses the literature related to the system, Chapter three illustrates the methodologies used in coming up with the working prototype of the system, Chapter four includes system design and analysis, Chapter five contains the implementation and testing of the system and chapter six contains the summary of the work, discussions and recommendations.

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