Sonargaon University (SU)



"Design & Fabrication of an Automatic Lawn Mower"

A report submitted to the Department of Mechanical Engineering, Sonargaon University in partial fulfillment of the requirements for the Award of Degree of Bachelor of Science in Mechanical Engineering.

Submitted by

<u>Name</u>	<u>ID</u>
Ahmed Minhajur Rahman	BME-1501005137
Md. Mostak Alam khan	BME-1601008006
Ashaduzzaman	BME-1601008103
Md. Naimul Hassan	BME-1601008180

Supervised by

Md.Rakibul Alam

Lecturer,

Department of Mechanical Engineering,

Sonargaon University (SU)

February 2020

DECLARATION

We declare that this senior project entitled "Design & Fabrication of an Automatic Lawn Mower" the result of our own work. This project has not been accepted for any degree and is not concurrently submitted in candidature for any other degree or diploma elsewhere.

Ahmed Minhajur Rahman ID: BME1501005137

Md.Mostak Alam Khan ID: BME1601008006

Ashaduzzaman ID: BME1601008103

Md. Naimul Hassan ID: BME1601008180

I hereby declare that I have read this project. In my opinion, this project is sufficient in terms of scope and qualifies to meet the partial requirements for the award of the B. Sc. Engineering Degree in Mechanical.

Md.Rakibul Alam

Lecturer,

Department of Mechanical Engineering,

Sonargaon University (SU)

ACKNOWLEDGEMENT

All praise and glory is due to Allah, the lord, benefactor and cherisher of the entire world who has provided, guidance and necessary knowledge to complete this project work.

We would like to express our heartiest gratitude to Md. Rakibul Alam, Lecturer, Department of Mechanical Engineering.

For his constant guidance, inspiration and unbounded support is doing this work. We truly appreciate and value his guidance and encouragement. We are indebted to him for all the help he has provided us, the precious time he spent in editing mistakes and making sure the project work always is the track.

We would like to acknowledge those who all helped us to complete this work. The role of the university and the department has been very important and helpful for me during the whole period of research.

Finally, our warmest tribute to our parents, all our family members, lots of our friends, seniors, juniors who has every time supported us by their prayers and well wishes.

ABASTRACT

This project is proposing an effective goal for developing a machine that will perform useful task independently with minimal supervision. The objective of this project is to discover the current issues in implementing the design of a Battery powered lawn mower used to cut grass in house gardens, and fields with a specified area. It has achieved by doing research on current issues in designing the mechanism with electronic control circuitry. The simplicity of making this automated lawn mower has made it very versatile and flexible. The main objective of this AC powered lawn cutter is to cut grass using battery power which is stored by using voltage regulator. It is also very useful for low cost of fabrication and maintenance.

TABLE OF CONTENTS

<u>Title</u>		Page No
Declaration		ii
Acknowledgement		iii
Abstract		iv
CHAPTER-1	INTRODUCTION	1-2
(1.1) Background		1
(1.2) Objective		2
CHAPTER-2	LITERATURE REVIEW	3-5
CHAPTER-3	COMPONENTS DESCRIPTION	6-22
(3.1) Arduino Nano		6
(3.1.1) Specification		8
(3.1.2) Features		8
(3.1.3) IC ATMEL MEGA328p		9
(3.2) Bluetooth Module HC-05		9
(3.2.1) HC-05 Technical Specifications		10
(3.2.2) Application		10
(3.2.3) How to Use the HC-05 Bluetooth		11
(3.2.4) Configuration of Bluetooth Module		12
(3.3) Transformer		14
(3.3.1) The Transformer Principle		14
(3.4) Battery		15
(3.5) Resistor		16
(3.5.1) Theory of Operation		17
(3.6) DC Gear Motor		17
(3.6.1) Types of DC Motors/Gear		18
(3.6.2) Motor Specifications		19
(3.7) Relay		20

CHAPTER-4	SOFTWARE DESCRIPTION	23-25
(4.1) Arduino software		23
(4.2) Proteus		24
(4.3) PCB Design		25
CHAPTER-5	WORKING PRINCIPLE	27-37
(5.1) System Description		27
(5.2) Block Diagram		28
(5.3) Schematic Diagram		29
(5.4) Working Principle		29
(5.5) 3D Figure Of Lawn Mower		30-33
(5.6) List of Components		34
(5.7) Program For Andr Operation		35-37
CHAPTER-6	DISSCUSSION& CONCLUSION	38-39
(6.1) Discussion		38
(6.2) Future Work		38
(6.3) Conclusion		38
Reference		39

21

22

(3.8) Blades

(3.9) Full Wave Bridge Rectifier

LIST OF FIGURE

Figure No Description	Page No
(3.1.1) Arduino Nano	6
(3.1.2) Arduino Schematic Diagram	7
(3.1.3) Section of Aarduino Nano	8
(3.1.4) IC ATMELmega328p	9
(3.2.1) Bluetooth Module HC-05	10
(3.2.2) Use the HC-05 Bluetooth	11
(3.3.1) Transformer Circuit Symbol	13
(3.3.2) Transformer Construction	14
(3.3.3) AC Supply	14
(3.3.4) Coil	15
(3.4) Battery	16
(3.5) Resister	17
(3.6) DC Gear Motor	18
(3.7) Relay	20
(3.8) Blades for cut the grasses	21
(3.9) Rectifier Waveform	22
(4.2) Proteus Software Interface	25
(4.3) PCB Design of proteus	26
(5.1) Final Project	27
(5.2) Block Diagram	28
(5.3) Schematic Diagram	29
(5.5.1) 3D Figure of Lawn mower	30

(5.5.2)	Elbow	30
(5.5.3)	3D Figure Of Motor	31
(5.5.4)	3D Figure Of Tee	31
(5.5.5)	3D Figure Of U	32
(5.5.6)	3D Figure Of Wheel	32
(5.5.7)	3D Figure Of Main Frame Wheel	33