

**CONCEPT DEVELOPMENT OF AUTOMATIC SLIDING  
DOOR AND LIGHT USING NODEMCU SENSOR**

**FINAL PROJECT REPORT**



**Submitted to Comply with Terms of Completion  
Study Program of Mechanical Engineering Production and Maintenance**

**By:**

**Jasmine Arum Pandini  
061940212742**

**MECHANICAL ENGINEERING DEPARTEMENT  
STATE POLYTECHNIC OF SRWIJAYA  
PALEMBANG  
2023**

**CONCEPT DEVELOPMENT OF AUTOMATIC SLIDING  
DOOR AND LIGHT USING NODEMCU SENSOR**



**FINAL PROJECT REPORT**

**Submitted to Comply with Terms of Completion  
Study Program of Mechanical Engineering Production and Maintenance**

**Pembimbing Utama,**

**Muhammad Asyraf Bin Zulkipli  
No. S012017120005**

**Pembimbing Pendamping,**

**Fenoria Putri, S.T., M.T.  
NIP. 197202201998022001**

**Mengetahui,  
Ketua Jurusan Teknik Mesin,**

**Ir. Sairul Effendi, M.T.  
NIP 196309121989031005**

## **ABSTRACT**

### **CONCEPT DEVELOPMENT OF AUTOMATIC SLIDING DOOR AND LIGHT USING NODEMCU SENSOR**

**Jasmine Arum Pandini**

ix + 43 pages, 3 tables, 1 appendix

The rapid advancement of technology has led to the emergence of smart systems that aim to enhance convenience, energy efficiency, and safety. In this study, we present the development of an automatic door and light system utilizing a NodeMCU sensor. The system is designed to automatically control the opening and closing of doors, as well as the illumination of lights in indoor environments. To implement the system, we utilized the NodeMCU sensors onboard Wi-Fi capabilities, enabling remote control and monitoring via a dedicated mobile application. The application provides users with the ability to customize various system parameters, according to their specific requirements.

**Keywords:** NodeMCU, Automatic, Blynk

## INTEGRITY STATEMENT

The undersigned below:

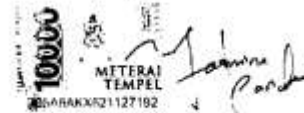
Name : Jasmine Arum Pandini  
NIM : 061940212742  
Study Program : Bachelor of Applied Mechanical Production and  
Maintenance Engineering Sarjana  
Thesis Title : **CONCEPT DEVELOPMENT OF AUTOMATIC  
SLIDING DOOR AND LIGHT USING  
NODEMCU SENSOR**

Declare that the thesis I wrote is my own work and was accompanied by a team of supervisors and **is not the result of plagiarism**. If in the future elements of plagiarism are found in the thesis that I wrote, then I am willing to accept academic sanctions from the Sriwijaya State Polytechnic.

This statement I made in a conscious and unforced state.



Palembang, Agustus 2023



Jasmine Arum Pandini  
NIM. 061940212742

## ACKNOWLEDGEMENT

Praise the author goes to ALLAH SWT because of love and His grace, so that the author can complete this project.

In carrying out the making of this project, from preparation to the process of preparing the report, the author received a lot of help from various parties, in the form of guidance, instructions, information and services. Therefore in this opportunity the author would like to express deepest gratitude to:

1. ALLAH SWT, because of His mercy, the gift of knowledge, opportunities and His health, the author is able to carry out final project report what the author made.
2. The author's parents, mama Ellen and papa Toyo who always give prayer and encouragement to the author during the project and thesis. Your support means the world for the author.
3. Author's guardianship, tante Lia and om Maman who always takes care of author at Kancil Putih home and tante Anna who always give "uang jajan" to author also Ahmad Juang as my little brotha.
4. Mr. Muhammad Asyraf bin Zulkipli as supervisor who have guided the author to complete final project.
5. Mr. Mohd Arif Fahmi bin Rosli as evaluator who give some advise to author final project.
6. Mrs. Fenoria Putri, S.T., M.T., as supervisor from Sriwijaya State Polytechnic.
7. All of author lecturer's from Management and Science University and Sriwijaya State Polytechnic who have equip the author with a useful knowledge base before the writer start the project.
8. Class of 2019 in the Department of Mechanical Engineering, State Polytechnic Sriwijaya. Especially Astri and Amel who always picks up with yellow Supra and accommodates in your koskosan.
9. All my housemates at Menara U2 18-08: Eresyah, Linda, Noveli, Ticlau and Tzt that have helped and encouraged while living in Malaysia.
10. My sissy, Fahra, Lija, Frizka, Salwa and Nia which could not be mentioned about their kindness, big thanks for all my sisters.

The author is fully aware that there are still many deficiencies in the preparation of this report. Therefore, suggestions and constructive criticism are expected to be given. The author also hopes that this final project report can be useful for fellow readers and academics wherever they are.

## TABLE OF CONTENT

	<b>Page</b>
<b>ABSTRACT .....</b>	<b>1</b>
<b>INTEGRITY STATEMENT.....</b>	<b>2</b>
<b>ACKNOWLEDGEMENT .....</b>	<b>3</b>
<b>TABLE OF CONTENT .....</b>	<b>4</b>
<b>LIST OF TABLES .....</b>	<b>6</b>
<b>LIST OF FIGURE .....</b>	<b>7</b>
<b>CHAPTER I INTRODUCTION.....</b>	<b>1</b>
1.1 Project Background .....	1
1.2 Problem Statement.....	1
1.3 Objective of The Study .....	2
1.4 Scope The Project .....	2
1.5 Significance of Project.....	2
1.6 Limitation of The Study.....	3
<b>CHAPTER II LITERATURE REVIEW .....</b>	<b>4</b>
2.1 Review of Current Situation.....	4
2.2 Review of Related Literature .....	4
2.2.1 Design of Automatic Slide Doors Using Arduino and Passive Infrared (PIR).....	4
2.2.2 Automatic Door Using Arduino and Passive Infrared Sensor (PIR).....	5
2.2.3 Design and Build an Sliding Door Prototype Using Passive Infrared Sensor Based on Arduino (Case Study of Regional General Hospital).....	5
2.2.4 Development of Automatic Light Control System Using Fuzzy-Based Time Delay Scheme .....	6
2.2.5 Automatic Light on Control System Using Motion Sensor in Arduino-Based Learning Room.....	6
2.2.6 Automatic Door Control System of Computer Sciences Faculty with Iot-Based.....	7
2.2.7 Automatic Door Design Monitoring System Iot Based Using Esp32-Cam .....	7
2.2.8 Door Security System with Android Using Nodemcu .....	8
2.2.9 Smart House Lighting Automation and Remote Control System Based NodeMCU ESP8266 .....	8
2.2.10. Design Automatic Door System Using Wireless Network with IoT Based.....	9
2.3 Review of Related Product.....	9
2.3.1 Automatic Sliding Doors Using Passive Infrared Sensor .....	10
2.3.2 Development of Automatic Light Control System .....	11
2.4 Summary.....	11

<b>CHAPTER III RESEARCH DESIGN AND METHODOLOGY .....</b>	<b>15</b>
3.1 Research/Project Methodology .....	15
3.1.1 Phase 1 : Planning .....	15
3.1.3 Phase 3 : Design .....	15
3.1.4 Phase 4 : Implementation.....	16
3.1.5 Phase 5 : Maintenance.....	16
3.2 Development Methodology .....	16
3.2.1 Block Diagram .....	17
3.2.2 Flowchart .....	18
3.3 Tools and Hardware.....	19
3.3.1 NodeMCU.....	19
3.3.2 Magnet Switch.....	19
3.3.3 Motor Driver.....	20
3.3.4 DC Motor .....	20
3.3.5 Relay 2 Channel .....	21
3.3.6 Power Supply 12V 13A .....	21
3.3.7 Light Bulb .....	22
3.3.8 STEPDOWN 3A.....	22
3.3.9 Buzzer.....	23
3.4 Software Requirements.....	23
3.4.1 Solidworks .....	24
3.4.2 Arduino IDE .....	24
3.4.3 Blynk .....	24
3.5 Project Schedule .....	25
<b>CHAPTER IV FINDING AND DISCUSSION .....</b>	<b>26</b>
4.0 Overview .....	26
4.1 Final Design .....	26
4.2 Testing .....	27
4.3 System Test .....	27
4.3.1 NodeMCU Test.....	29
4.3.2 Blynk Application Test.....	31
4.3.3 Whole Component Response Testing.....	36
4.4 Analysis The Result of The Whole Project.....	38
<b>CHAPTER V CONCLUSION .....</b>	<b>39</b>
5.1 Summary .....	39
5.2 Conclusion.....	39
5.3 Recommendation.....	40
<b>BIBLIOGRAPHY .....</b>	<b>42</b>
<b>APPENDIX .....</b>	<b>44</b>

## LIST OF TABLES

	<b>Page</b>
Table 2. 1 Summary Table .....	11
Table 3. 1 Project Schedule.....	25
Tabel 4. 1 Testing result.....	36

## LIST OF FIGURE

	<b>Page</b>
Figure 2. 1 Arduino-based automatic door prototype using PIR sensor .....	10
Figure 2. 2 Automatic lamp design circuit using PIR sensor.....	11
Figure 3. 1 Block Diagram of Automatic Sliding Door and Light .....	17
Figure 3. 2 Flowchart of Automatic Door and Light .....	18
Figure 3. 3 NodeMCU .....	19
Figure 3. 4 Magnet Switch Sensor .....	20
Figure 3. 5 Motor Driver.....	20
Figure 3. 6 DC Motor.....	21
Figure 3. 7 Relay 2 Channel.....	21
Figure 3. 8 Power Supply 12V 3A .....	22
Figure 3. 9 Light Bulb .....	22
Figure 3. 10 Stepdown 3A .....	23
Figure 3. 11 Buzzer .....	23
Figure 4. 1 The circuit of development sliding door and light.....	26
Figure 4. 2 The design of the place where the circuit/program is implemented....	27
Figure 4. 3 (a) front view of the prototype, (b) inside view of the prototype, (c) magnetic switch sensor installed on the door.....	28
Figure 4. 4 A series of components to process the program .....	29
Figure 4. 5 Wi-Fi dan password name according to the Arduino code.....	30
Figure 4. 6 LED NodeMCU as connection indicator.....	30
Figure 4. 7 Device connected into the Wi-Fi .....	31
Figure 4. 8 Home display on Blynk application .....	32
Figure 4. 9 Blynk not connected .....	32
Figure 4. 10 Display to send the command.....	33
Figure 4. 11 Giving commands to device from smartphone .....	33
Figure 4. 12 The light turn off with Blynk command .....	34
Figure 4. 13 Device running the commands .....	34
Figure 4. 14 (a) Notification via lockscreen from Blynk, (b) Notification via application from Blynk .....	35