



اَبُو سَيِّدِي تَكْنُوْلُوْجِي مَارَا
UNIVERSITI
TEKNOLOGI
MARA

**MEC 332
MECHANICAL ENGINEERING DESIGN**

SCOOTY BAG

PREPARED BY:

NAME	ID NUMBER
MOHAMAD EZZAT AIDEED BIN JAHMALUDIN	2013459238
MUHAMMAD AIMAN BIN YUSRI	2013234808
AYESHA BINTI AZNI KUMAR	2013471056
WAN AFIQAH ADLINA BINTI WAN RAHAIZAD	2013432362

CLASS: J4EM1106E

LECTURER: SIR FIRDAUS BIN SUKARMAN

SUPERVISOR: MISS LIYANA BINTI ROSLAN

DATE OF SUBMISSION:

20 MARCH 2016

ACKNOWLEDGEMENT

Assalamualaikum. First we would like to thank Allah to let this report complete. Next, the team member would like to express our sincere gratitude to Sir Firdaus Bin Sukarman (Lecturer of MEC 332), Sir Matzaini Bin Katon (Head of subject MEC 332) and Miss Liyana Binti Roslan (Team Supervisor) for providing us with the opportunity to prepare and guiding us throughout this Final Year Project. Each of the team member would like to acknowledge their valuable guidance and support that motivated us to contribute tremendously to this report. The success of this report also depends on the encouragement and guidelines of many others such as our parents, lecturers and engineer assistant. Therefore, the team would like to take this opportunity to thank all of them who helped us through this report.

Trough this project, the team have gained a lot of experience in finding out more about the subject matter and the application that have been apply through this Final Year Project. Moreover, the team have gained the knowledge of the process and how this subject actually help the team member to be a first class future engineer. After the project, the team realized that to be an engineer and innovate a product need a lot of hard work and patience.

Last but not least, each of the team member would like to thank to all the fellow friends who were always support and be there when needed.

Thank you.

ABSTRACT

First and foremost, this group has decided to innovate a scooter to be a scooter bag for the final year project during the last semester. We see the needs for students in school and university carrying heavy bag to school and any other places, to solve the problem the group have an idea to make the scooter bag. To move the scooter bag, the 24V motor combine with 2 battery of 12V and chain are used. Therefore, the group have calculated that the scooter bag can travel at about 20km/h and can support in excess to 80 kilograms. The scooter is made out of aluminum, plain carbon steel and the deck is made out of wood to make it lighter. Moreover, scooter bag can be fold and easy to carry anywhere that we wanted to. The main objectives of the scooter bag are to help students especially universities student go to places such as class, park, grocer and etc. with ease. Next, the group has used RM650 for the equipment and transportation mainly for the scooter bag expenses and it is worth it because it can be functional in students' daily life in the future undertaking. In a conclusion, the venture of doing Scooter bag has many obstacles and challenges, the group has frequently change the idea how to make the Scooter bag work as it cannot be functional if the group has not modified a bit of things that blocking the Scooter bag to function, it would be a waste because the group has already come out with a lot of effort and expenses. Lastly, the group hope that the Scooter bag can be something that makes a different to the students' life.

TABLE OF CONTENTS

No	CONTENT	Page
1	CHAPTER 1: INTRODUCTION	1-2
2	CHAPTER 2: DESIGN PROBLEM DEFINITION	
	2.1 Market Analysis	
	2.1.1 General Need for Product	3
	2.1.2 Description and Estimation of Market Size	4-5
	2.1.3 Competitive Products and Benchmarking	5-7
	2.1.4 Opportunity for Competitive Advantage	8
	2.2 Physic of the Artifact	9-10
	2.3 Criteria for Selecting Final Design Concept	11
	2.4 Final Product Design Specification	11-12
3	CHAPTER 3: CONCEPT GENERATION AND SELECTION	
	3.1 Feasible Concepts	
	3.1.1 Morphological Chart	13-14
	3.1.2 Concept 1	15
	3.1.3 Concept 2	16
	3.1.4 Concept 3	17
	3.1.5 Concept 4	18
	3.1.1 Concept 5	19
	3.2 Selection of Final Concept	
	3.2.1 Pugh Chart	20
	3.2.2 Discussion	21

4	CHAPTER 4: EMBODIMENT DESIGN	
	4.1 Describe Final Design Concept	22-23
	4.2 Product Architecture	24-27
	4.3 Configuration Design	
	4.3.1 List of Parts	28-29
	4.3.2 Details Standard Part Selection	29-30
	4.4 Parametric Design for Custom Parts	30-31
<hr/>		
5	CHAPTER 5: DETAIL DESIGN	
	5.1 Engineering Drawing Set	
	5.1.1 Detail Drawings of Manufactured Parts	32
	5.1.2 Assembly Drawings	33
	5.1.3 Exploded Drawings	34
	5.2 Bill of Material and Costing	35
<hr/>		
6	CHAPTER 6: PROTOTYPING AND TESTING	
	6.1 Fabrication of Prototype	36-38
	6.2 Testing of Design: Mathematical Models, Simulations and Prototype	39-52
<hr/>		
7	CHAPTER 7: CONCLUSIONS AND RECOMMENDATION	
	7.1 Conclusions on Designed Product	53
	7.2 Future Works	54
<hr/>		
8	CHAPTER 8: REFLECTION ON THE DESIGN PROCESS	
	8.1 Strength	55
	8.2 Weakness	56