# UNIVERSITI TEKNOLOGI MARA 

## DESIGN, ANALYSIS AND FABRICATE OF ICE CREAM MACHINE WITH DISPENSERS

## NUR'AIN HUMAIRA BINTI MOHAMAD NASIR

Dissertation submitted in partial fulfillment of the requirements for the degree of

Diploma
(Mechanical Engineering)

College of Engineering

March 2022


#### Abstract

During this globalization era, many machines and electrical devices have been created or upgraded into a better version to make people feel more comfortable and ease their work. An ice cream machine with dispenser is developed according to the market demand. Due to difficulties to freeze the ice cream and store the toppings, this project aims to fabricate an ice cream machine with dispenser that can freeze the ice cream less than overnight by using Peltier as cooling element. The cooling element is powered by power supply AC to DC because it is more efficient and easier. This project obtains to design, analyses and fabricate an ice cream machine with dispenser that can save more time and easy to dispense the toppings. To conclude, this machine will give benefits to many people.


## ACKNOWLEDGEMENT

Firstly, and foremost, praises and thanks to ALLAH, the Almighty, for His showers of blessings throughout this final year project for two semesters and managed to complete this project successfully.

I would like to express my sincere gratitude to my supervisor, Ts. Nurulsaidatulsyida Binti Sulong for continuous support, patience, motivation, and immense knowledge in completion this project.

With deep sense of gratitude, I acknowledge the encouragement and support that I received throughout these two semesters of doing this project from my parents, Mr. Nasir, and Mrs. Sharifah Norashikin for their financial supports and encouragement when I need it. Not forgetting my siblings, friends, and all people who keep praying for me.

Lastly, I would like to express my extreme sincere to my honorable University, UiTM for accepting me to be the one of the students in here.

## TABLE OF CONTENTS

Page
CONFIRMATION BY SUPERVISOR ..... 2
AUTHOR'S DECLARATION ..... 3
ABSTRACT ..... 4
ACKNOWLEDGEMENT ..... 5
TABLE OF CONTENTS ..... 6
LIST OF TABLES ..... 7
LIST OF FIGURES ..... 9
LIST OF ABBREVIATIONS ..... 11
CHAPTER ONE INTRODUCTION ..... 1
1.1 Background of Study ..... 1
1.2 Problem Statement ..... 1
1.3 Objectives ..... 2
1.4 Scope of Work ..... 2
1.5 Significance of Study ..... 3
CHAPTER TWO LITERATURE REVIEW ..... 7
2.1 Information of Existing Products, Patents, \& Standard ..... 7
2.2 Product Design Specification Based on Literature Review ..... 12
CHAPTER THREE METHODOLOGY ..... 17
3.1 Methodology ..... 17
3.2 Prototype Drawing and Bill of Material, BOM ..... 17
3.3 Calculation and Computational Analysis ..... 25
3.3.1 Engineering Calculation ..... 27
3.3.2 Cost Calculation ..... 29
3.3.3 Computational Analysis ..... 29
3.4 Fabrication Process ..... 29
3.4.1 Equipment and Tools ..... 29
3.4.2 Step by step Fabrication Process ..... 32
3.5 Final Fabricated Working Prototype ..... 40
CHAPTER FOUR RESULTS AND DISCUSSION ..... 41
4.1 Introduction ..... 41

## CHAPTER ONE

## INTRODUCTION

### 1.1 Background of Study

In Malaysia, ice cream is a multi-billion-pound market that is generally recession-proof and truly customer-oriented. It is often a treat and always a celebration as people buy ice cream. These days, artisanal ice cream shops can be found almost everywhere, fulfilling a craving that is almost difficult to resist on hot days while still adding a variety of innovative flavours that will confound even the most seasoned dessert connoisseur. A simple cup of ice cream is always delish and go-to for everyone but embellish it with one or two of the toppings will bring the swagger.

This project tends to help people who own a cafe that sells ice cream or for personal use. The ice cream machine function to process soft-serve ice cream using two dispensers that can fill up the toppings and syrup. Other than that, it helps people to be more organized and systematic for their stall or at home. It does help the customer to save their money from buying 2 machines separately which are an ice cream machine and dispenser. It is also suitable for beginners who are planning to start their ice cream business. What differs from this product and the others this ice cream machine is an innovation from the ordinary ice cream machine but improvised to make life easier and organized. Also, might help people who consists fast, neat, less work and easy to work on.

### 1.2 Problem Statement

Many of the ice cream machines in the market only can make ice cream. Hence, they need to buy other types of machines for their toppings. In addition, the customer needed to wait for a long time to scoop the ice cream. Also, the if the useris the seller of ice cream, they may have some problems such as tired to roll the ice cream, messy when putting on the topping, take time to roll then put the topping on if they have many customers. The user needed to pay for a high cost to buy a both machines which are ice cream and dispenser.

