



**UNIVERSITI TEKNOLOGI MARA CAWANGAN BUKIT
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MEC299

**DESIGN AND FABRICATION OF
INDOOR HYDROPONIC PLANT GROW TENT**

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ABSTRACT

The purpose of hydroponic plant grow tent helping a lot of people in growing their favorite plant at their house. Average hydroponic tents are expensive that doesn't include any other components like cooling system and the tent also hard to move because of the design. This will be troubles for person who want to have their hydroponic tent inside their house. To fabricate and design the indoor hydroponic plant grow tent equipped with LED grow light, cooling fan and suitable shape for indoor. Usually for the tent, people use greenhouse grow tent which is very expensive. Changes made by choose the shoe cabinet to fabricated for the tent through design process to make it the greatest design and affordable. Without certainty, the problems can be solved if solution identified to make sure project success.

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CHPATER 1: INTRODUCTION

1.1 Background of Study

To put simply hydroponics is a way to skip the soil, sub in a different material to support the roots of the plant, and grow crops directly in nutrient-rich water. There are multiple approaches to designing hydroponic systems, but the core elements are essentially the same. The elements are fresh water, oxygen, root support, nutrients and light. There are also several advantages of hydroponic. The first is it can grow anywhere. Growing seasons and regions are in major flux right now as temperatures change and growing conditions change along with them. Even in normal conditions, there are plenty of places where the ground just isn't conducive for farming. Second is higher yields. Since roots are bathed in all the nutrients they need, plants spend more time growing upward and less time and energy growing extensive root systems to search for food. Next is fewer resources because hydroponic systems actually use less water than traditional soil-based systems. Lastly, easy troubleshooting. With a hydroponic system, you know exactly what conditions your plants are being grown in.

There are lists of common issues for individuals who want to garden at home. People who live at home that doesn't have yard or garden space for gardening will have no idea how to garden. Because of that, they must use indoor farming hydroponic plant grow in order to farm at home. One of the deals is the moisture on the air and soil. To make sure the plants grow in magnificent and healthy. The second is the weather may not be suitable for the plants. When gardening outside the weather always changes and can't be controlled. For examples, hot weather all day. For addition, the outside has a lot of animals and bugs that may destroy the plants.

This indoor farming hydroponic plant grow tent aims to tackle climate change issue by conserving water. It has 2 level that can support plants. The grow lights help with stimulating photosynthesis even in the absence of natural light. Temperature sensor also used to monitor the temperature changes and with the help of fan can jump into action to regulate the temperature. They can plant easily as this product help to set temperature and moisture of soil that perfect for plants to grow. This product is not very large and doesn't use a lot of space. So, everyone can plant their favorite plants at home.

1.2 Problem Statement

One of the problems from common indoor hydroponic plant grow tent is it doesn't have components to control the temperature inside the tent and inefficient lightning for the plant. This will make the plants hard to grow as their desirable environment. The other problem is common hydroponic tent usually dull and have less features at high cost. People also need to provide more space to place it. In addition, it is difficult for people to move their hydroponic tent to place they desired.

1.3 Objectives

- a) To design hydroponic plant grow tent that provide suitable temperature and lightning.
- b) To fabricate indoor hydroponic plant grow tent.

1.4 Scope of Project

These are scope of works in this project:

- a) The main material that will be used in this project is wood.
- b) The fabrication process includes cutting, drilling, joining and wood joinery.
- c) For designing process using A4 paper and Solidworks application.
- d) Using hinge for open close the door of the tent.
- e) Using electric current to supply power for the light.
- f) Simple pipeline for waterway.

1.5 Significant of the Project

- a) To increase engineering knowledge:

To create a new design for hydroponic tent plant. One of it is determining the proper materials for fabrication process. Select the suitable woods that is strong and easy for cutting, joining and drilling process. Other than that, the knowledge about pipeline for the efficient waterway to grow plants. Another is about the electric current to make the lamp, fan and also temperature sensor working perfectly.