



**UNIVERSITI TEKNOLOGI MARA**  
**CAWANGAN TERENGGANU**

**MEC299**

**FABRICATION AND DESIGN OF THE FOLDABLE  
HOUSE STAIRS**

**MUHAMMAD AL IKRAM BIN AKMAL**

**2020613538**

**SUPERVISOR:**

**MADAM NORHASHIDAH MANAP**

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## **ABSTRACT**

A folding staircase can be used to save space especially for a small house, or garage. It folds out of the way when not in use, as the name implies, making it the ideal alternative when you don't have enough space to install normal steps [1]. Stairs are one of architecture's oldest and most complex design problems. Aesthetics, pedestrian circulation, construction, and safety all work together to form a complex network of variables. Despite the fact that stairs are essentially parametric, designers have been eager to adopt and implement simplistic standardisation schemes, which are frequently unrelated to safety concerns [2]. Furthermore, while there are several computerised systems for automated stair design, there has been little, if any, interest in computer-based stair design analysis.

House stairs is the common thing in the house especially for those who live on double-storey house. Mostly architectures used exactly the same common house stairs design in every house where ever which country is it. And the disadvantages of house stairs are it can cause stair accidents. Stairs present a potential danger for young children, the elderly, or anyone with mobility issues. And if you ever need to install a stair lift, expect to shell out thousands of dollars. The foldable house stairs can prevent mostly of those accident. This project is made for the purpose of small house with the problem of stairs installation because to build house stair it required a lot of space. This product will help to solve the problem that happened to those people.

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# CHAPTER 1

## INTRODUCTION

### 1.0 Background of Study

When listing the main elements of a house design, the staircase is usually one of the first essential parts to be named. The main purpose of the stairs is to provide a simple and easy way to move between the floors of the building. The location of the stairs in the floor plan of a new building is always an important decision as it often determines the floor plan of the entire property. In historical times, homes and shelters had been made from handiest single-storey, however it was realized that the place above floor degree might be utilize to growth the quantity of area a shape ought to offer.

Stairs enabled users of those houses to fast and efficiently get admission to higher levels; as homes grew, the staircase unexpectedly have become extra necessary. Stairs design plays an important role in promoting better health due to the health benefits of stair climbing as a form of exercise such as improved weight control, lower cholesterol levels and better cardiovascular fitness. Based on research done, Stairways are believed to have a higher capacity for increasing light to mild physical activities in component due to their potential to be used in each multistory building. The staircase is an uncomplicated structure that does not require electricity to function, saves the owner's money and has much less environmental impact. [3]

Well-made stairs can last for generations without replacement and can be updated, painted or refurbished to keep up with the current fashion, depending on the original design. Careful consideration going into their structure and placement. During 19<sup>th</sup> of century until the beginning of the 20<sup>th</sup> of century and with the introduction of passenger elevators, stairs were the most common form of Communication between floors [4]. The effect of stairs on the movement of people and objects in a space is double. In their earliest forms, stairs were the primary means of communication between space in a house, as an alternative to the modern hallway.

Nicholas Cooper, author of *Houses of the Gentry: 1480-1680*, wrote that when significant parts of the British house moved from the ground floor to the first floor, they assumed a larger ceremonial function and were treated as a formal space with embellishment requirements. It is not possible to determine whether the stairs were used consciously or unknowingly with these aspects in mind, but as shown in Andrea Palladio's *Classic Volume 1*, Chapter XXVIII. In addition, the architect considered the stairs to some extent.

It is important to note that the patterns of movement observed on the stairs are consistent among all users. This is clearly shown by John Templer's work on how stairs are eroded in a regular pattern and regular wear is seen along a particular path.