

# Digital Advisory Weighting Scale

GE-105: Introduction to Engineering Design. Summer semester, 1436. group 2 section 3441 supervisor: Dr. Mohammed A. Khamis.

## Introduction

A healthy diet is a good tools to optimize the general health of a person. Unfortunately, obesity rates increased by almost 3 times in the past 20 years because of the lack of knowledge to the proper diet.

## Problem statement

Many people find it difficult to determine if their weight is healthy, and how to obtain the best diet by knowing the nutritional values that they need to consume daily.

## Objectives

**Primary objective:**  
Design a digital scale that is able to measure the person weight to calculate the nutritional values needed to consume in a day.

**Secondary objective:**  
it will calculate the number of calories needed change the weight. In addition to an exercise plan.

## Criteria

- o Low cost.
- o Durability.
- o weight
- o Safety
- o Power consumption.

## Constrains:

- o Cost 150 S.R.
- o Maximum weight 200 KG.
- o 120-200cm for height measurement.

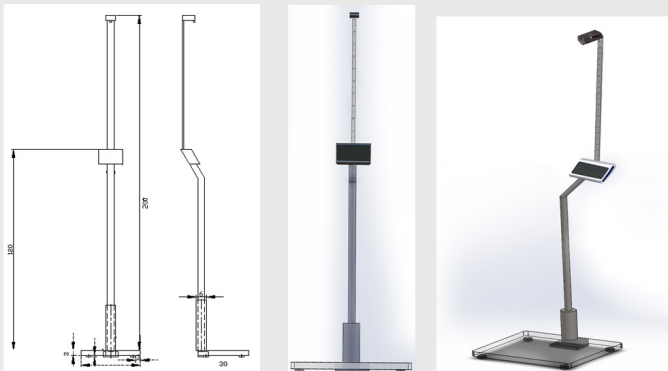
## Morphological analysis

| Feature/Function.  | 1                                      | 2                         | 3                 | 4              | 5              | 6            |
|--------------------|--|---------------------------|-------------------|----------------|----------------|--------------|
| Material for scale | Aluminum                               | Steel                     | Plastic           | Glass          | Silver         | Wood         |
| Power source       | rechargeable Built-in battery(lithium) | CR2032 Battery            | Electrical outlet | AAA battery    | Nuclear energy | Solar energy |
| Display Type       | LCD display                            | OLED display              | TFT display       |                |                |              |
| Control type       | Touch screen                           | analog stick and keyboard | Voice control     | Remote control |                |              |
| Shape of scale     | Circular                               | Square                    | Rectangular       | Hexagonal      | Triangle       |              |
| Material for stand | Aluminum                               | Steel                     | Plastic           | Glass          | Silver         | Wood         |

## Weight and Rate

|           | Low cost | Durability | Lightweight | Safety | Low power consumption | Evaluation |
|-----------|----------|------------|-------------|--------|-----------------------|------------|
| Weight    | 10       | 40         | 10          | 10     | 30                    |            |
| Concept 1 | 7        | 6          | 5           | 6      | 6                     | 600        |
|           | 70       | 240        | 50          | 60     | 180                   |            |
| Concept 2 | 8        | 7          | 4           | 6      | 7                     | 670        |
|           | 80       | 280        | 40          | 60     | 210                   |            |
| Concept 3 | 5        | 5          | 7           | 6      | 4                     | 500        |
|           | 50       | 200        | 70          | 60     | 120                   |            |
| Concept 4 | 4        | 4          | 8           | 6      | 6                     | 520        |
|           | 40       | 160        | 80          | 60     | 180                   |            |
| Concept 5 | 6        | 7          | 9           | 8      | 8                     | 730        |
|           | 60       | 280        | 90          | 80     | 240                   |            |

## Best design

| Design 5   | Glass | Aluminum | CR2032 battery | OLED display | Touch screen | Rectangular |
|--|-------|----------|----------------|--------------|--------------|-------------|
|  |       |          |                |              |              |             |

## Need analysis

- o Weight and Height measurement.
- o Advise the best diet program.
- o to last 5 years in normal usage.
- o Low power consumption.
- o Exercise plan.
- o Light weight.
- o Easy-to-maintain.

## Needed Information

- o Average height and weight
- o Different types of material
- o Sources of power
- o Display
- o Diets and exercises

## Human factors

### Anthropometric Factors:

- o Scale dimensions :35(l)+30(w)
- o Maximum stand height 200cm.
- o Maximum weight is 200 KG.

### Ergonomic Factors:

- o Fast responsive touch screen
- o Flexible stand for easy adjustment
- o Display height 120cm for easy reach to the screen

### Physiological factors:

- o Display is not too bright for the eyes.
- o Light and clear color combination for best screen reading.
- o Different font sizes.

### Psychological:

- o Graphical user interface is attractive.
- o The scale design is attractive.
- o Using colors as indicators for weight

## Conclusion

Our digital scale in addition to measuring the weight and height, will advise the best diet program by showing the needed amount of calories and different nutrition presented in an attractive GUI that is easy to use.