

# SENIOR DESIGN – I

## The hope device



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# Introduction

## Motor Disabilities

- **Motor or mobility disabilities and impairments are prevalent worldwide**

**Making supporters for people who has foot paralysis or injured and they are not able to walk.**

**The device will make them able to walk using their hands holding the two different supporters that holds their foot.**

# PROJECT OBJECTIVES

Following are some of key primary objectives of the project:

- To facilitate & support physically challenged people to rid their solitary lifestyles
- **To attract & acknowledge them into mainstream society**
- To make them forget their predicaments, loneliness, sorrow, pain & grief
- To add more value contentment in their lives
- To provide opportunities for income growth
- **To ensure Health, Wellness & Quality of Life**
- To enhance happiness by improving their living standards

# PROJECT GOALS

Following are our primary goals of the project:

- Design & Develop Crutches
- Evaluate Crutches' effectiveness, usefulness, suitability, convenience & comfort
- Gather information & knowledge on disabled people
- Visit them in person – at home, hospitals, or workplaces
- Deliver prototype of crutches - few selected designs – for trial use
- Obtain user feedback
- Make required modifications – materials, specifications, & support accessories etc.

# PROJECT SPONSORS

Following stakeholders are the sponsors of **Senior Design- I Project** on “*Assistive Device Project For Physically Challenged*”:

- **Dr.Sara Oman**
- **Mechanical Engineering Department**

# BACKGROUND & BENCHMARKING

## Products and Services

- Make market survey on available Top-20 models of crutches
- **Compare & Evaluate Product Features**
- Review Triple Cs (Costs, Conveniences & Compatibility)
- **Choose best 5 Models/Brands of Crutches**
- Apply engineering – mechanical, material & financial – design changes
- Initiate development of prototypes
- Experiment and Test quality, safety & suitability
- **Obtain government approval, certification & recommendation**
- Adopt approved designs for mass production & marketing

# ENGINEERING REQUIREMENTS

- **Total cost \$150 ± \$50**
- **Device weight cannot exceed 5kg**
- **Appropriate price for spare parts (\$30-\$50).**
- **Materials used durable and comfortable [(outer iron) (inner sponge)]**
- **Maintenance cost between (\$40-\$60).**

# Customer Requirement

To develop state-of-the-art user friendly *Assistive Technology*

## Key Success Factors (KSFs)

To develop *Assistive Technology*, with following value-chain benefits:

- User-Friendly
- Affordability
- Light-Weight
- Low physical strain
- Increased comfort and convenience
- Low repairs & maintenance costs
- Manuverability



# QFD

House of Quality (HoQ)							
Customer Requirement	Weight	Engineering Requirement	Total cost \$151	Device weight cannot exceed 5kg	User must be able to left 5 l	Appropriate price for spare parts (\$)	Maintenance cost between (\$5)
1. User-Friendly	3		9	9	9	6	6
2. Affordability	4			9	9	3	6
3. Light-Weight	5		6	9	9		
4. Low physical strain	4			9	6		
5. Increased comfort and convenience	5		3	6	9		
6. Low repairs & maintenance costs	5		6			9	9
7. Manuverability	4			9	9		
<b>Absolute Technical Importance (ATI)</b>			102	201	222	85	87
<b>Relative Technical Importance (RTI)</b>			3	4	5	1	2
<b>Target ER values</b>			\$150	5	5	40	50
<b>Unit</b>			USD	kg	kg	USD	USD
<b>Tolerances of Ers</b>			±50	<5	<5	±10	±10
<b>Testing Procedure (TP#)</b>							

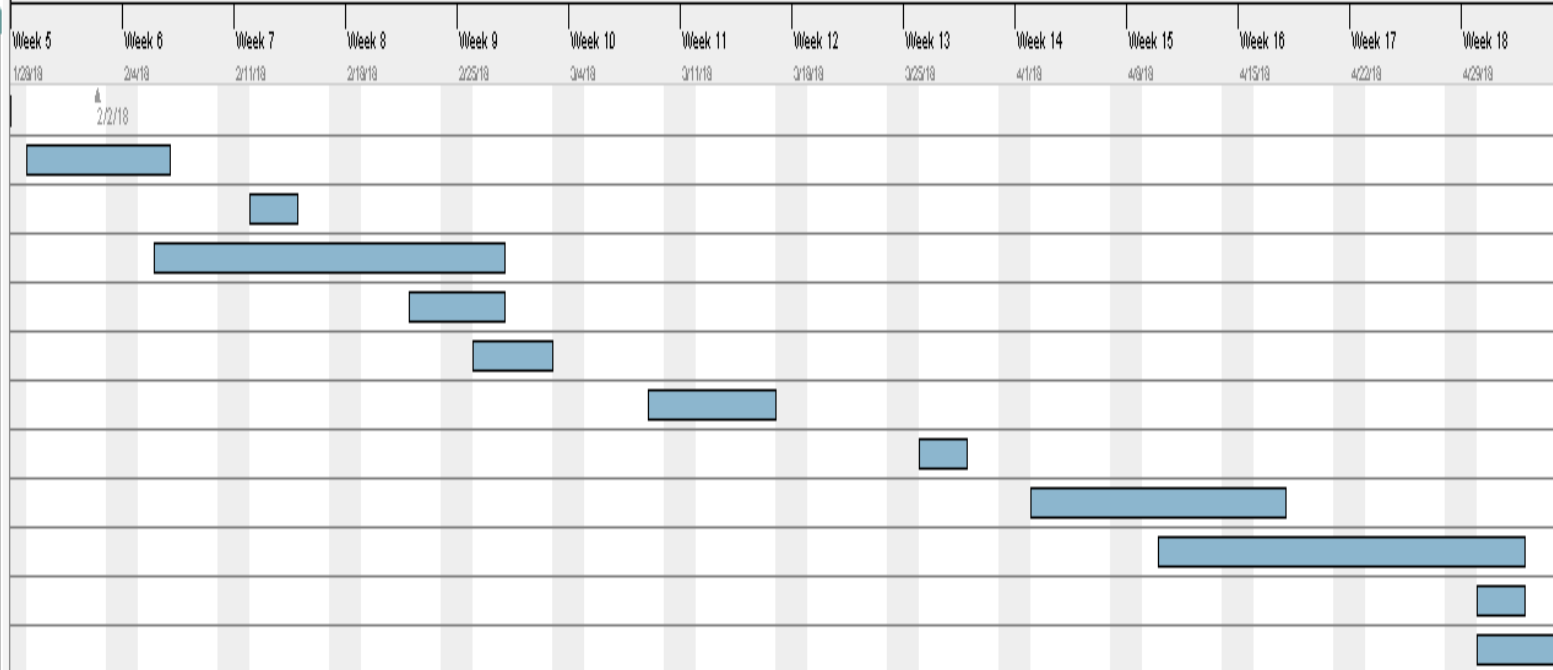
# SCHEDULE & BUDGET

The 3D printing that all what we have to pay for.



2018

Name	Begin date	End date
Team Charter	1/22/18	1/25/18
Presentation1	1/29/18	2/6/18
Website Check1	2/12/18	2/14/18
TA Meeting	2/6/18	2/27/18
Presentation2	2/22/18	2/27/18
Preliminary Report	2/26/18	3/2/18
Team memo	3/9/18	3/16/18
Website Check2	3/26/18	3/28/18
Final presentation	4/2/18	4/17/18
Final CAD	4/10/18	5/2/18
Website Check3	4/30/18	5/2/18
inal prototype	4/30/18	5/4/18



# CONCLUSION

- Information presented under the, Assistive Device Project For Physically Challenged, Senior Design – I Project requires further reviews & analysis.
- Sponsors will gather knowledge on emerging AD technology innovations
- AD product lines would be constantly modified & upgraded
- Research and Development (R&D) investments will be continued
- AD Products marketed in future will incorporate state-of-the-art innovations & mechanical engineering applications

# References

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