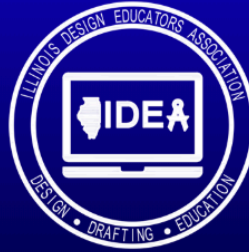


# IDEA

Illinois Design Educators Association



## IDEA Engineering Design Competition



### **Problem Statement:**

Recently IATP presented at the ITEC-IDEA conference and they wanted to challenge students to create an assistive technology product for a real client. **The Illinois Assistive Technology Program (IATP)** is a non-profit organization that provides Illinoisans with disabilities and health conditions a greater access to assistive technology. Assistive technology is any item, piece of equipment, or product system that is used to increase, maintain, or improve functional capabilities of individuals with disabilities. Here at IATP we have many different departments that cover all types of assistive technology. Some of these products cover areas such as products that assist with home living, kitchen activities, recreation, work-related activities, etc.

One of our departments is the Makers department where they make custom assistive technology with the use of 3D printers and other fabrication methods. They are a well-rounded team of engineers, occupational therapists, product specialists and more that work together on projects.

They offer already-existing open-source products online that assist people with their daily activities. People can either download and 3D print the products themselves or IATP Makers will ship them. They also create custom assistive technology for people that does not already exist. They use the design process and work directly with the customer to create something that not only works but is to their liking. IATP Makers services are free to customers if they are an Illinois resident.

Learn more **The Illinois Assistive Technology Program (IATP)** by using the links below.

IATP Makers Tour Video: [https://youtu.be/F\\_tCfUKOYUM](https://youtu.be/F_tCfUKOYUM)

IATP Makers Website: <https://iatpmakers.org>

Contact Email: makers@iltech.org

Michael is an individual who suffered a spinal cord injury that has caused him to be a quadriplegic in his late 40s. He would like an assistive grabber to help him grab objects near him. Michael knows that you are taking a high school engineering design class and would like to challenge your team to create this product.

This product needs to be able to mechanically extend to reach objects, then be able to collapse down for easy storage. The top of the grabber should be able to grasp objects to be brought to Micheal. You may use electronics to cause the “grasping” function of the reacher if you wish.

Michael uses a motorized wheelchair; it would be nice to be able to store the grabber with him attached to the wheelchair so he can access it when needed. He also likes the color teal and Batman.

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The design must be:

- Affordable – under \$50
- Open source – Others can take drawings, files, etc. to recreate the product easily
- It will be able to at least reach to up to 30 inches
- The hand of the grabber (top) can “grasp” with some type of activation
- Be able to be stored with any type of wheelchair
- You are encouraged to use some of your school’s latest technology to produce parts – laser cutters, 3D printers, CNC machines, etc.

### **Procedure:**

Your team, made up of 3 members, will focus on completing a presentation and project solution to present and sell your firm's design to the client. Upon arrival to the IDEA competition, all members of the firm should come prepared to give a presentation of their project solution to a panel of judges. Your firm should arrive to the competition with the presentation and project solution made ahead of time. The presentation should include:

### **Deliverables:**

Design solution:

- Engineering Notebook documenting the design process and your design solution.
- A Gantt Chart documenting the solution process and activities involved.
- A full set of engineering drawings for the solution using AutoCAD, Inventor, SolidWorks, etc.
- Bill of Materials-BOM
- Cost estimate for the prototype and the production
- Product plan of procedure or assembly instructions and visuals that your clients can follow.
- Storage for the product.
- A prototype of your solution
- Any additional information or documentation needed to communicate the design solution.

Display:

- Display Board
- Present your product with a medium of your choice.
- Title and description of the Engineering Design competition and your design solution.
- Documentation of the design process and your design solution

**Presentation:**

Your team will have up to 10 minutes for the presentation of your product including your design, unique features of your design, estimated cost to produce, and lessons learned through the design process. A 5-minute question and answer period may/will follow your presentation.

Other documentation:

To be considered for an interview a resume and business card must be presented to the judges.

**Judging Criteria**

Judges will rate the following criteria based on information learned through the presentations and the design solution.

Quality and Clarity of Presentation	20%	20 pts
Quality of the Engineering Notebook	20%	20 pts
Functionality and Practicality of the Design Solution	20%	20 pts
Technical Quality of Documentation and Drawings	20%	20 pts
Technical Quality of Prototype	10%	10 pts
Meeting of Presentation Time Requirements	5%	5pts
<u>Resume &amp; Business Card</u>	<u>5%</u>	<u>5pts</u>
	100%	100 pts

Judging Criteria

Judges will rate the following criteria based on information learned through the presentations and the design solution.

Each category above will be rated on a scale of one (poor) to max points (excellent).

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