

The Yaeger Foundation, Inc. presents the

# **BIONIC / ROBOTIC HAND KIT™**

## **2017 C O M P E T I T I O N**

**13<sup>th</sup> Annual Event at the Miami Dade District SECME Olympiad**

**Saturday, February 4, 2017 • Miami Dade College North Campus**

Imagine the excitement of:



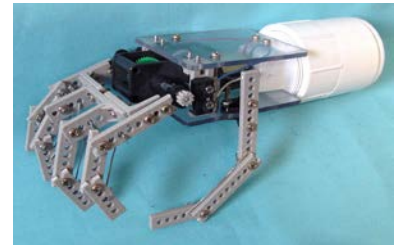
Forming a bioengineering team with your classmates --



Creating a functioning bionic hand prototype --



Competing against other student teams for awards!



**THE CHALLENGE** - Your team will act as founders of a new biomedical company that is pursuing a large U. S. Government prosthetics contract. To win the contract your company must redesign the Mark I, an existing electric bionic hand. You will be provided with the parts, tools & instructions to build the Mark I. Your team must find ways of improving the function and appearance of this Hand without exceeding a fixed budget. The team must complete a functioning prototype and presentation.



**THE COMPETITION** - Your team will compete against other teams by demonstrating re-engineered hands to a panel of judges for final evaluation. Prizes will be awarded to teams scoring the highest points overall in four judging categories.



**ELIGIBILITY** - Teams of 2 to 4 students can enter in the Middle School Division (grades 6-8) or Senior High Division (grades 9-12)

**HOW TO ENTER** - To receive the official Mark I Bionic/Robotic Hand Kit, complete the Entry Form and return with registration fee (\$150/team via credit card or check only). For forms and additional information please contact *The Yaeger Foundation, Inc.* at: (305) 751-4208; fax (305) 691-3784; IG500@aol.com; 1177 M.L. King Boulevard, Miami, FL 33150.



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## **2017 Bionic/Robotic Hand Kit Competition™**

*Please read carefully!*

The Competition provides a hands-on career exploration experience by allowing students to form simulated biotech companies that develop and present a prosthetic hand prototype. Students are not required to possess a high level of technical expertise because all teams begin with a basic set of components and instructions. Each team then creates a customized design that is only limited by the students' ingenuity. Each team must also prepare an oral presentation that introduces their prosthetic hand product. This activity allows students to simulate the presentations delivered to venture capitalists by biotechnology entrepreneurs. Each school should select 1 to 2 teams that will compete at the Bionic/Robotic Hand Kit Competition. At least two team members must be present at the Competition. Judges representing industry and education will select overall winners based upon total points earned in the judging categories listed below. The Bionic/Robotic Hand Kit Competition was created by Ivan Yaeger, Chief Executive Officer of The Yaeger Companies and inventor of the patented Yaeger Arm prosthesis.

### **DESIGN PARAMETERS**

Each team of 2 to 4 students begins by building the Bionic/Robotic Hand Kit, which is included in the \$150.00 registration fee. Using this as a common start point, teams will reengineer the Hand to produce their own custom-designed prototype. Teams must produce a prototype designed to be primarily a wearable prosthesis that can be used by a hand amputee. It must therefore be (1) lightweight; (2) powered by a portable, self-contained power source; (3) provide the ability to grip, manipulate and hold objects; and (4) be easily and safely operated by a physically challenged user. However, the hand can also have other industrial uses in robotics and other applications. Teams can incorporate virtually any material, mechanical system, power system and control system. Points will be awarded on technical innovation and creating use of improvised materials. Creativity and recycling of salvaged materials will generate greater points. Each team must spend no more than \$200 for additional materials and components. Teams must document expenses by submitting a detailed budget and copies of receipts.

### **JUDGING CATAGORIES**

**Points will be awarded for performance in these areas. Total points will be tallied to determine First, Second and Third Place overall winners.**

**Innovative Engineering** – Points are awarded for creative application of engineering and design. Modifications to the basic Hand Kit include added features and functions.

**Product Demonstration** – The functionality of each design is assessed through a series of timed tests. The student using the prosthesis must be able to hold it with their hand and grasp, manipulate and release a variety of objects.

**Most Realistic Prosthesis** – Points are awarded for special attention applied to cosmetics and motion to produce the most aesthetically refined prosthetic hand prototype.

**Effective Presentation** -- Teams will explain their design modifications, unique features, materials used and budget of their prosthetic prototypes. This should include the benefits provided to a patient. **It must not exceed three minutes. No PowerPoint can be used.**

**2017 Bionic/Robotic Hand Kit Competition™**  
**Sample Rubric Score Sheet**

**SCHOOL:** \_\_\_\_\_ **TEAM:** \_\_\_\_\_

Please evaluate the following with 5 to 1 as Strength (5) to Weakness (1).

<b>Innovative Engineering</b>	<b>Points</b>	<b>Comments</b>
1. Creative application of engineering		
2. Modified design, supplemental functions additional features to basic hand		
3. Compliance with contest rules/parameters		
4. Innovative use of materials		
<b>Product Demonstration</b>	<b>Points</b>	<b>Comments</b>
1. Completion of series of timed tests		
2. Manipulate prosthesis with one hand		
3. Prosthesis able to grasp and release objects		
4. Present the product within the time limit		
<b>Most Realistic Prosthesis</b>	<b>Points</b>	<b>Comments</b>
1. Aesthetically refined prosthetic hand prototype		
2. Attention to applied cosmetics		
3. Light weight and easily operated by a challenged user		
4. Particular attention to motion		
<b>Effective Presentation</b>	<b>Points</b>	<b>Comments</b>
1. Deliver a professional style presentation within the time limit		
2. Explain design modifications and unique features		
3. Describe materials used and function		
4. Documentation of detailed budget		

**Total Points:** \_\_\_\_\_

**OVERALL COMMENTS:**    **Comments will be evaluated in case of a tie.**

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# Bionic/Robotic Hand Kit Competition™

## 2017 MIAMI DADE ENTRY FORM

School: \_\_\_\_\_

Address: \_\_\_\_\_ Zip \_\_\_\_\_

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_

E-Mail: \_\_\_\_\_

Teacher/Sponsor: \_\_\_\_\_

Number of Teams \_\_\_\_\_

Team Members (if students are not yet selected write TBA):

Team 1	Team 2

Item	Price Per Team	Quantity	Total
HK-2 Bionic/Robotic Hand Kit w/Tool Set	\$ 150		\$
<b>TOTAL</b>			\$
Credit card type		Exp. Date	
Credit card #		Security code	
Billing Name			
Billing Address			

Fax or mail this form with credit card information or check for \$150 per team to:

***The Yaeger Foundation, Inc.***

***Attn: 2017 Competition***

***1177 M.L. King Boulevard***

***Miami, FL 33150***

**Fax to: (305) 691-3784**

**Email to: IG500@aol.com**

Your team(s) will receive their Kits at the October 29<sup>th</sup> SECME Bionic/Robotic Hand Competition Seminar. If unable to attend, Kits will be sent to your school for each registered team. You can contact us at (305) 751-4208 or cell (305) 342-3005.