

BIONIC / ROBOTIC HAND KIT®

2023 COMPETITION

19th Annual Event at the Miami-Dade District SECME Olympiad

**February 4, 2023 at Miami Dade College North Campus
11380 N. W. 27th Avenue**

Imagine the excitement of:



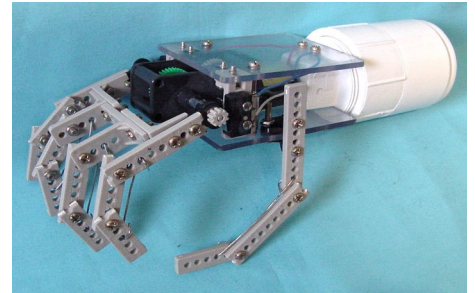
Forming a bioengineering team with your classmates



Creating a functioning bionic hand prototype



Competing against other student teams for awards!



THE CHALLENGE – Your team will act as founders of a biotech startup that is pursuing a large U. S. Government prosthetics contract. To win the contract your company must redesign the Mark I, an existing bionic hand. You will be provided with the parts, tools and 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 – One team of 2 to 4 students per school 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 \$125 registration fee per team (credit card or check only). For forms and additional information please contact *The Yaeger Foundation, Inc.* at: (305) 751-4208; fax (305) 691-3784; info@yaegerco.com; 1177 M.L. King Boulevard, Miami, FL 33150.



© 2023 T.Y. F., Inc. 9/20 rev



2023 BIONIC/ROBOTIC HAND KIT COMPETITION

Please read carefully!

The Competition provides a hands-on career exploration experience by allowing students to form a simulated biotech company that develops and presents a prosthetic hand prototype. Students are not required to possess a high level of technical expertise. Each team begins by assembling the same initial product, then creates a customized design that is only limited by their ingenuity. 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 can select one (1) team that will complete 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 \$125.00 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 creative 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 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.

2023 BIONIC/ROBOTIC HAND KIT COMPETITION™

Sample Score Sheet Rubric

Evaluate the following on 1 to 5 point scale (1 = weakest / 5 = strongest).

Innovative Engineering	Points	Comments
1) Creative application of engineering		
2) Modified design, supplemental functions, additional features added to Mark I hand		
3) Compliance with contest rules/parameters		
4) Innovative use of materials		
Product Demonstration	Points	Comments
1) Completion of series of timed tests		
2) Operation of prosthesis with one hand		
3) Prosthesis can grasp and release objects		
4) Prosthesis can hold objects of varying weight		
Most Realistic Prosthesis	Points	Comments
1) Aesthetically refined prosthetic hand prototype		
2) Attention to life-like appearance, size and weight		
3) Easily worn and operated by a physically-challenged user		
4) Prosthesis replicates natural motion of human hand		
Effective Presentation	Points	Comments
1) Delivery of a "professional" presentation within the time limit		
2) Explanation of design modifications and unique features		
3) Detailed description of function and materials used		
4) Documentation of detailed budget		

Total Points: _____

BIONIC/ROBOTIC HAND KIT® COMPETITION

2023 MIAMI-DADE ENTRY FORM

- You may purchase any quantity Bionic/Robotic Hand Kits for a class activity or spare parts.
- You may order kits for several teams, but must select ONE team to compete at the Olympiad.

School: _____

Address: _____ City _____ Zip _____

Phone: _____ Fax: _____

E-Mail: _____

Teacher/Sponsor: _____

Number of Kits Needed _____

Team Members (if students are not yet selected write TBA):	
1)	3)
2)	4)

Item	Price Per Team	Quantity	Total
HK-2 Bionic/Robotic Hand Kit w/Tool Set	\$ 125		\$
TOTAL			\$
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 \$125 per team to:

The Yaeger Foundation, Inc.

Attn: 2023 Competition

1177 N.W. 62nd Street

Miami, FL 33150

Fax to: (305) 691-3784

Email to: info@yaegerco.com

Kits can be shipped to your school or picked up at the SECME Bionic/Robotic Hand Competition Seminar (tentative date 12/3). Please contact us at (305) 751-4208 or (305) 342-3005 for additional information.