

# DESIGNING THE FUTURE

## What is Mechanical Engineering Senior Design at Hopkins?

MORE THAN 1,200 STUDENTS have graduated from the Department of Mechanical Engineering's capstone program since its founding in 1984. Each year, industry sponsors' cutting-edge projects motivate and excite our students to explore the challenges of design engineering in the real world.

Our sponsors provide student teams with funds for materials, access to world-class resources, and technical contacts; and the students provide sponsors with functioning prototypes that have gone through the design loop several times and have been tested at the clients' facilities.

The Senior Design experience is much like an apprenticeship: students learn to work in teams, meet deadlines, manage project resources, and apply critical thinking to real problems that matter.

## Why Sponsor?

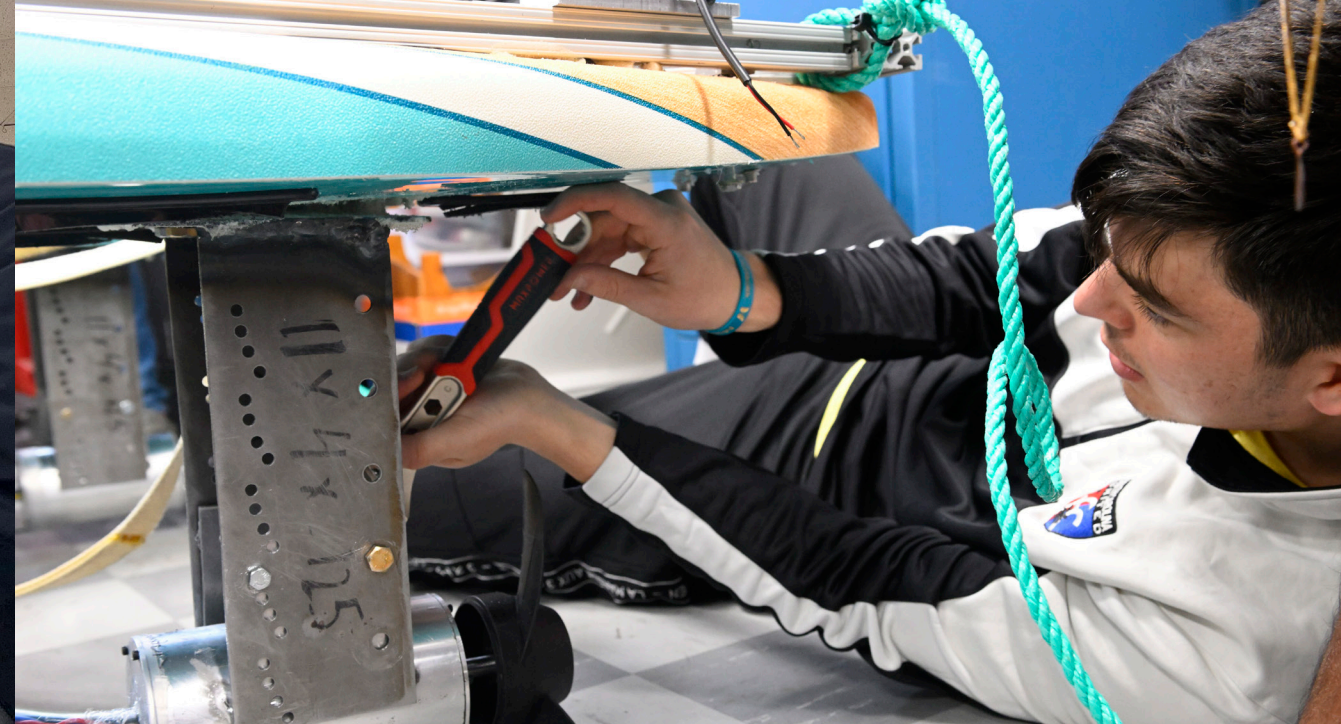
OUR SENIOR DESIGN PROGRAM has a strong history of collaboration with sponsors from a range of disciplines across industry, government, academia, and nonprofit. Sponsors provide an open-ended problem and our students take the project through the design process to deliver their client an inventive, tangible solution. Projects that sponsors may not have the time or resources to pursue become the top priority of a team of Hopkins engineers.

Sponsors are exposed to the fresh perspectives and creative thinking of the very best undergraduate engineers and Hopkins faculty members. They also get access to a pool of talented potential employees. The capstone Senior Design experience allows students to develop skills and apply concepts that are valued by employers. In return, sponsors get the opportunity to connect with the next generation of leaders in innovation and engineering design—a win-win for all involved.



**“The Pollen Eyes project exemplifies the pinnacle of interdisciplinary collaboration, merging cutting-edge engineering with environmental science. Its seamless integration of hardware and software showcases the depth of expertise and dedication of the senior design team.”**

LEONARD BIELORY, M.D., PROFESSOR OF MEDICINE, ALLERGY, IMMUNOLOGY AND OPHTHALMOLOGY | HACKENSACK MERIDIAN SCHOOL OF MEDICINE DIRECTOR | KEAN UNIVERSITY CENTER FOR AEROBIOLOGICAL RESEARCH (KEAN-CARES)



**“The JHU TBI24 Senior Design Team has been a pleasure to work with. They have been competent, professional, and responsive to requests for modifying their testing procedures to ensure the client is satisfied with their work. In addition, the team has provided feedback on the device they are testing that was above and beyond what was asked of them. I hope the team has enjoyed this experience nearly as much as I have.”**

DENNIS MCGURK | RTI

**“It was a tremendous experience working with the highly motivated students at a high caliber program such as John Hopkins. I would recommend the program for anyone looking to establish or further a prototype. The resources John Hopkins has to offer the students and sponsors alike far exceeded the time and money investment.”**

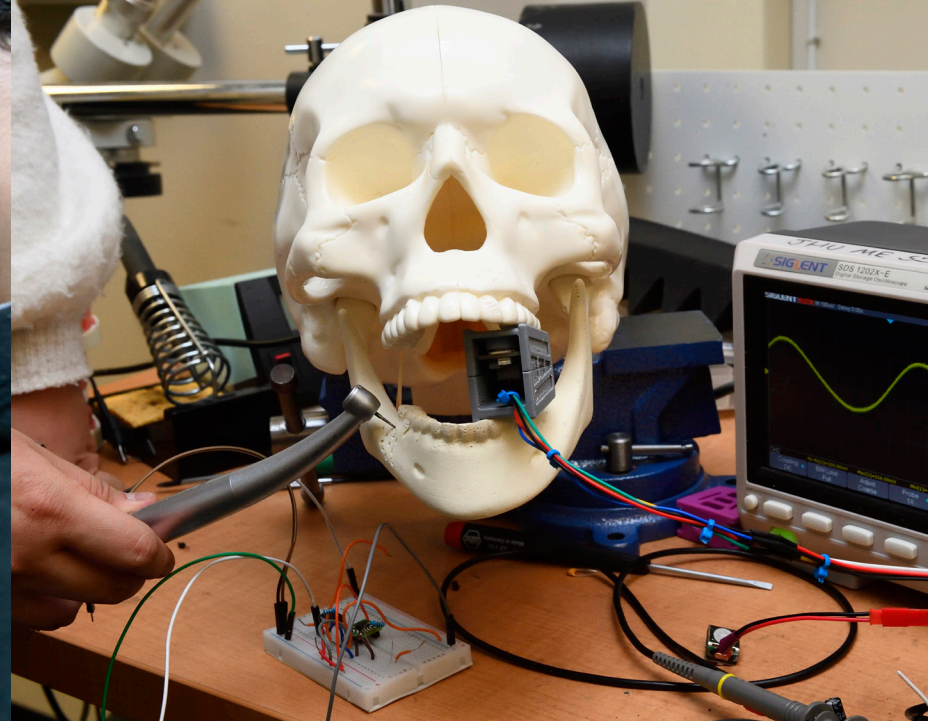
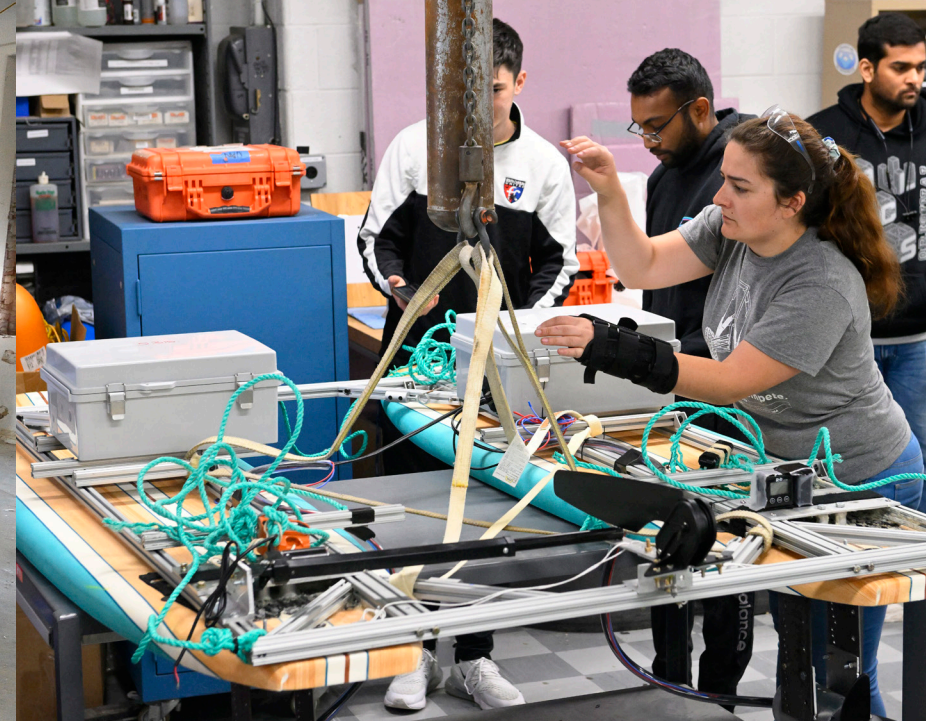
DR. JORDAN RIGSBY | ROARK DENTAL CORP.

To sponsor a project or for more information, contact Rich Bauernschub (rbauern1@jhu.edu) or visit the Department of Mechanical Engineering at [me.jhu.edu](https://me.jhu.edu).



**MECHANICAL  
ENGINEERING  
SENIOR  
DESIGN  
2024**





“Working with our sponsors and clients at Blind Industries & Services of Maryland on assistive technology was so rewarding. Just knowing that someday our project would make a blind person feel empowered instead of limited in their disability is everything I hoped my mechanical engineering career would be.”

REGINALD ORIBH  
SENIOR DESIGN ALUM '21  
TECHNICAL ANALYST  
ACCENTURE FEDERAL SERVICES



One thing I hear repeatedly from our mechanical engineering students is how much they value the Senior Design experience, from the opportunity to work with sponsors to the guidance and mentoring they receive from the course's dedicated teaching staff.

Most characterize it as “the most challenging and rewarding experience I have had during my time at Hopkins.” The capstone of their years of study of mechanical engineering, Senior Design is an opportunity for our students not only to demonstrate a knowledge of scientific concepts, but also to apply their deep understanding of engineering principles to real-world design projects presented by sponsors from industry, non-profits, and governmental organizations.

The results of these student projects are nothing short of remarkable—for both students and sponsors. Students get access to sponsors' technical contacts and resources, and learn to work within budgets to create solutions to real problems. Sponsors come away with working prototypes complete with user manuals, specifications, and design histories, not to mention the opportunity to take an up-close-and-personal look at some extraordinarily talented potential employees. Both parties benefit immeasurably.

GRETAR TRYGGVASON  
DEPARTMENT HEAD AND CHARLES A. MILLER, JR.  
DISTINGUISHED PROFESSOR  
DEPARTMENT OF MECHANICAL ENGINEERING

## SENIOR DESIGN DAY // 2024 current projects

### SBD24

**Stanley, Black & Decker**  
Noise-canceling leaf blower  
*Leen Alfaoury, Michael Chacón, Madison Morrison, Andrew Palacio*

### DENTAL24

**Roark Dental Corporation**  
Noise-canceling, vibration-reducing bite plate  
*Conor Allan, Elizabeth Dolan, David Paik, Daniel Shenkelman*

### BISM24

**Blind Industries & Services of Maryland**  
Fabric defect identification  
*Ray Chen, Jay Lawrence, Harrison Le, Amy Zhang*

### ASNE24

**American Society of Naval Engineers**  
Building and racing an electric boat  
*Xander Song, Nina Tedeschi, Nand Vommi, Tyler White*

### IQT24

**IQT Laboratories**  
Low-cost autonomous maritime loitering platform  
*Theo DeGuzman, Gen Mehra, Owen Mitchell, Iris Renteria*

### CHINOOK24

**Naval Air Station, Patuxent River**  
Airframe modifications to aid CH-47 cargo testing  
*Ben Lehrer, Elliot Lee, Peter Klopp, Fritz Maurath*

### POLLEN24

**Dr. Leonard Bielory, M.D.**  
Automated pollen detection device  
*Zach Alligodd, Sean Enright, Olivia Perry*

### EVT24

**Dr. Venkata Akshintala, JHU School of Medicine**  
Endoscopic vacuum therapy  
*Damian Cano, Jay Heymann, Thomas Miller, Alex Ren*

### APL24

**JHU Applied Physics Laboratory**  
Persistent in-line load sensor for osseointegrated implants  
*David Corrente, Ariana Diaz, Mikala Furman, James Kaluna*

### TBI24

**Research Triangle Institute International**  
Q-Collar test system for traumatic brain injury  
*Josh Anderson, Patrick Deans, Yanni Nikas, Luke Schuerrman*