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.

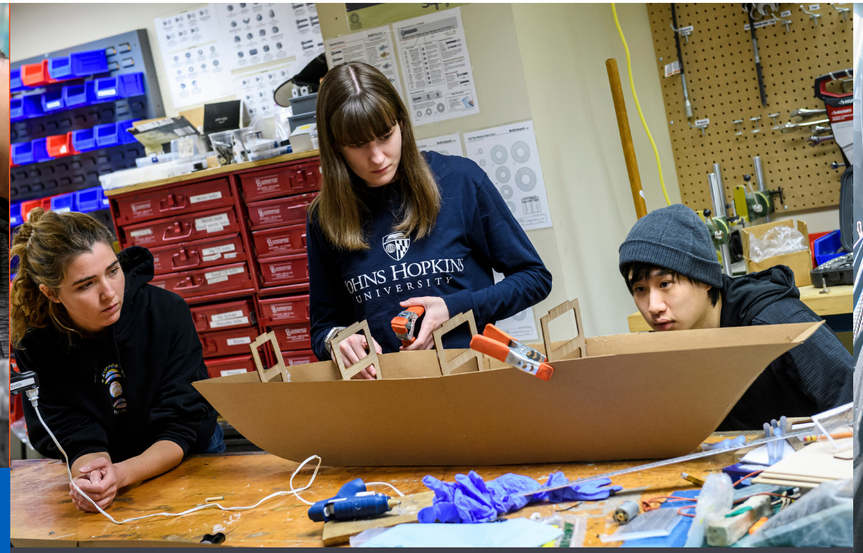
Why Sponsor?

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. It is a win-win for all involved.

"For a small cost, ARL gets the chance have engineering students work on a design challenge that is important to our mission and could provide great payback. As a sponsor, ARL helps young engineers coming out of college be much more productive when starting their careers. One major benefit for ARL is that we have hired some graduates and they were ready to jump right in."

BRADFORD DAVIS
U.S. ARMY RESEARCH LABORATORY,
ADELPHI, MARYLAND



"While working with my Senior Design team, I was able to truly dive into the engineering process and gain experience I was not able to in any other class. From designing, rapid prototyping, manufacturing, testing to presenting, and communicating with sponsors—the amount of work that is directly applicable to industry is significant. I feel fully prepared to apply everything I have learned and continue to build upon this experience for the remainder of my career."

ELAYNA WILLIAMS, SENIOR DESIGN ALUM '22

"For my Senior Design team, I was chiefly responsible for FEAs, which I now do for my job. The technical presentation skills I gained in Senior Design, both in reports and in meetings, were invaluable and have definitely helped me excel in my current job where I am expected to communicate results to design teams and document my technical findings in a clear and thorough manner."

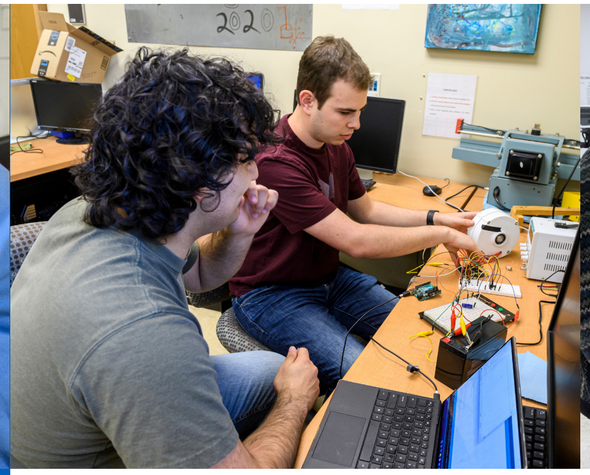
CAITLIN CLANCY, SENIOR DESIGN ALUM '17
MECHANICAL STRUCTURAL ANALYST, RAYTHEON

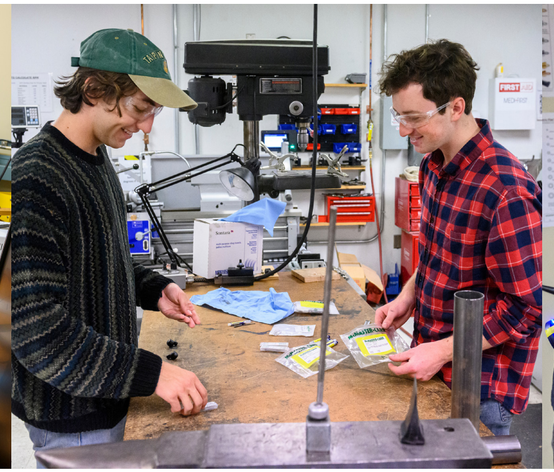
To sponsor a project or for more information, contact Nathan Scott (nscott@jhu.edu) or visit the Department of Mechanical Engineering at **me.jhu.edu**.

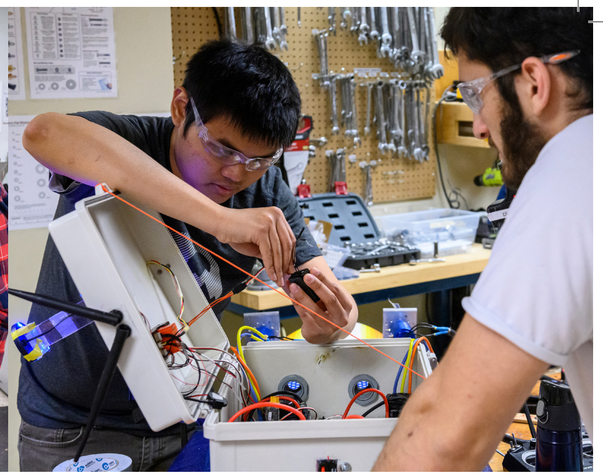
JOHNS HOPKINS
WHITING SCHOOL
of ENGINEERING

MECHANICAL ENGINEERING SENIOR DESIGN 2022

A MESSAGE FROM THE HEAD







> "Working with our sponsors and clients at Blind Industries and 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 // 2022 current projects

TEAM ASNE
Sponsor: American Society of Naval Engineers
Alexander Alessi, Dexter Amata, Victor Galindo, Michael Garcia, Daniel Nguyen
Build & race an electric boat

TEAM BWORM
Sponsor: JHU Bat lab
Megan Abate, Zach Galvarro, Katherine Ogg, Alyse Tran
Build and test 3D version of 2D room scale robot

CIRP
Sponsor: JHU Center for Injury Research & Policy
Max Garcia, Dante Hatcher, Kevin Hu, Rodrigo Murillo, Max Muss
Smoke detector & sprinkler system improvements

CRANIUS
Sponsor: CraniUS Inc.
Diego Gomez, Mark Gonzales, Elayna Williams, Jack Zheng
Functional prosthesis for skull with drug delivery

FORCEPS
Sponsor: JHMI Khasab product innovation lab
Yaw Aduse-Poku. Marcus Breed, Jaeho Lee, Herson Hernandez
Tiny forceps to take a biopsy from the bile duct

OCEAN
Sponsor: Oceaneering Inc.
Danielle Bejar, Noah Corbitt, Alan Huang, Sharon Reitsma
Robotic boat to follow an underwater ROV

PRIME
Sponsor: Prime Manufacturing Inc.
Diana Bershadsky, Hojun Lee, Manual Marin, Aaditya Rau
Oxygen concentrator for low-resource settings

SBD-DL
Sponsor: Stanley Black & Decker
Joshua Forni, Yensabro Kanashiro, Maya Sitaram, Kensei Suzuki
Data logger for battery powered lawn tools

SBD-ID
Sponsor: Stanley Black & Decker
Riley Groeschel, Jake Hill, Joe Somerville
Specialized angle grinder wheel identified by tool

SBD-MS
Sponsor: Stanley Black & Decker
Sophie Dunn, Preethi Kaliappan, Eleanor O'Callaghan, Neha Sangana
Life testing of commercial product

SPEED
Sponsor: Office of the Undersecretary of Defense
Jaykob Cave-Stevens, Alex Dixon, Nick Hirayama
Suppressing swinging of a load hanging below helicopter

STRENGTH
Sponsor: Office of the Undersecretary of Defense
Jack Albin, Kyle Battles, Max Daud, Emmett Turner
Strong but light floor panel for helicopter

STSCI-M
Sponsor: Space Telescope Science Institute
Mariam Abugri, Alexander Klein, Daniel Leongomez, Gwendolyn Tsai
Actuated segmented mirror development

WAVE
Sponsor: JH Applied Physics Laboratory
Matthew Jacobs, Melissa Leon-Munoz, Jeremy Schwartz, Zachary Souders
Wave power for Arctic data buoy