Design is at both the foundation and the apex of our mechanical engineers’ experience here at Hopkins. Engineers are, at heart, problem solvers. So, beginning freshmen year, we challenge our students to put into practical use all of the skills and knowledge they are learning in classrooms and laboratories.

The students’ capstone experience is, of course, the Senior Design Project. Senior Design is an opportunity for our students not only to demonstrate a knowledge of theories and scientific principles, but also to apply their deep understanding of engineering principles to tackle design projects offered by sponsors from industry, non-profit, and government organizations.

The results are nothing short of remarkable—for both sponsors and students. Sponsors come away with working prototypes, complete with user manuals, specifications and design histories. In addition, they get an up-close-and-personal look at promising potential employees. The students get access to the sponsors’ resources, and technical contacts, and learn to work within a budget to create real solutions to problems.

LOUIS L. WHITCOMB
Chair, Department of Mechanical Engineering

“Senior Design taught me the design process, which I use every day at my job. More importantly, I gained valuable insight into teamwork on engineering projects. For students looking to become engineers, practical and hands-on experience is so valuable. In fact, through my Senior Design teacher, I contacted an engineer at SBD, and after sending him pictures of my senior design project, I was asked for an interview. Now I work there.”

— JENNI HERCHEK ’14
DESIGN ENGINEER AT STANLEY BLACK & DECKER (TOWSON, MD)
“Working with these teams brings fresh perspectives and new insights to bear on some of the technical challenges we face. There have definitely been successful developments of product components as a result of this program, and it also helps us identify and hire talented young engineers.”

—DOUGLAS TROTTA, BALTIMORE AIRCOIL CO.

**Why sponsor a Student Design Team?** Every organization has a nagging problem that it just can’t seem to solve. Johns Hopkins engineering students excel at solving such problems. With their strong technical backgrounds, JHU students offer sponsors innovative approaches, solutions, and knowledge of the latest tools.

We can provide you with access to prospective employees who have the skills and qualities you need.

By sponsoring a senior design project, you can observe students’ teamwork and problem-solving skills firsthand and determine if a student is a good fit for your company’s culture. The senior design program provides an effective and efficient means to build relationships and identify top talent.

**What is Mechanical Engineering Senior Design at Hopkins?** The capstone experience in mechanical engineering at Hopkins, the Senior Design Project, challenges small teams of students to tackle design challenges posed by industry, government, and non-profit organizations. Sponsors provide teams with funds for materials, access to world-class resources and technical contacts, and students provide sponsors with a real-world prototypes that have been tested.
“My senior design project was the thing on my résumé that potential employers most wanted to talk about during interviews. It showed that . . . I had been able to successfully apply my knowledge on a project with a real budget and a real client. It allows employers to put more trust in you from day one.”

— Matthew Parmann, ’13
Mechanical Engineer, Space Systems/Orbital
(Palo Alto, CA)
7. SPONSOR: JHU BLOOMBERG SCHOOL OF PUBLIC HEALTH CENTER FOR INJURY RESEARCH AND POLICY
Team CIRP: Megan Carney, Joseph Hajj, Joseph Heaney, Welles Sakmar
Designed an anti-theft and tamper-resistant portable opioid pill dispenser.
Technical contacts: Andrea Gielen and Kavi Bhalla

8. SPONSOR: JHU DEPARTMENT OF CHEMICAL AND BIOMOLECULAR ENGINEERING
Team HFE: Lucas Broganer, Patrick Carney, Kanav Kathuria, Omar Randall
Developed a research-grade etching rig for a powerful acid, enabling quality etching with much less liquid volume.
Technical contacts: Zachary Gagnon and Dan Kuespert

9. SPONSOR: HONDA R&D AMERICAS INC.
Team HRA: Abdulmohsen Al Belushi, John Bacon, Wesley Cohen, Kyle Wall
Designed a system to determine the heat transfer coefficients of automotive radiators.
Technical contact: Adam Baumgartner ’10

10. SPONSOR: JHU INTERNATIONAL INJURY RESEARCH UNIT
Team IIRU: Yun Ahn, Young Jae Hue, Karen Kim, Sean Lee
Designed a low-cost helmet impact testing system for use with helmets manufactured in developing countries.
Technical contact: Kavi Bhalla

11. SPONSOR: SPACE TELESCOPE SCIENCE INSTITUTE
Team JWST: Nicole Cade-Ferreira, Wesley Erickson, Bailey Hannon, Michael Leviy, Rami Bedewi*, Colin Egan*, David Levi*, Bailey Surtees*
Designed a one-fifth scale deployable model of the James Webb Space Telescope, the successor to the Hubble Space Telescope. The model captures the complicated folding and deployment of the real telescope and will be featured by STScI in exhibits worldwide.
Technical contacts: Jason Kalirai and Hussein Jirdeh

12. SPONSOR: ALLEGION
Team KRPT: Jonah Eidman, Gideon Hou, Thomas Liu, Ryan Stolz
Explore different materials to produce a theft-resistant bike lock.
Technical contacts: Daniel Kindstrand, Alison Donlan, and Samir Tamer

13. SPONSOR: WALTER REED NATIONAL MILITARY MEDICAL CENTER
Team LIFT: Jorge Alvarado, Matthew Daum, Ryan Johnston, Walter Mayfield, Samantha Lott*
Designed a prosthetic foot for use with “shortie” prostheses, to improve gait and reduce rehabilitation time.
Technical contacts: LeRoy Oddie, with additional support from Dr. James Gilman

14. SPONSOR: LOCKHEED MARTIN
Team LMC: Alexander Demas, Joshua Friedman, Dev Patel, Thomas Schwartz, Luke Moloznik*
Developed a system to move a heavy shipping container within confined spaces aboard a ship.
Technical contacts: Jordan Ledford and Erik Phillips ’08

15. SPONSOR: JHU MILITARY AND VETERANS HEALTH INSTITUTE & JHU CLINICAL PHARMACOLOGY
Team MAL: Rachael Guess, Juan Carlos Villalonga
Developed a biochamber with drug concentration control for malaria research.
Technical contacts: Theresa Shapiro, Rahul Bakshi, and Elizabeth Nenortas; with additional support from Dr. James Gilman

16. SPONSOR: SPACE TELESCOPE SCIENCE INSTITUTE
Team STAR: Bobak Kiani, David Morra, Evan Rodbell, Sri Krishna Uppaluri, Joohyun Ahn*
Developed an atmosphere light attenuation measurement system which is carried aloft by a balloon, and returns autonomously to “home base.”
Technical contact: Susana Deustua

* indicates team member is a Junior classman and a student in the Junior level Engineering Design Process course
“Sponsoring a JHU senior design team is a meaningful way for AAI Textron to support and advance education in the field of engineering and have an opportunity to evaluate prospective talent. It’s always a pleasure interacting with the students and seeing the creative solutions they develop.”

— JEREMY BLEY, MECHANICAL ENGINEER, AAI TEXTRON AIR VEHICLE DESIGN & DEVELOPMENT

“Senior Design was enormously helpful. I learned how to properly attack a design problem, how to communicate with suppliers, how to effectively prototype and iterate and many more skills.”

— KIELAN CROW, ‘13, ASSOCIATE MECHANICAL ENGINEER, GOPRO (SAN MATEO, CA)

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.