

A Whole-Brain Education

The classroom alone isn't enough to create whole-brain thinkers. It's why Dean Julio M. Ottino sought to transform the student experience by expanding the curriculum in design and entrepreneurship, supporting interactive courses that promote well-being and mental health, and championing new student groups borne out of the school's growing leadership in areas like design and computer science.

"We appreciate the importance of encouraging students to follow their interests," Ottino says. "By participating in numerous activities, they are exposed to different viewpoints and ideas, and ways to use their engineering skills."

The effect of these changes has been notable. Northwestern Engineering's undergraduate admittance rate dropped from nearly 45 percent in 2006 to just 7 percent in 2022, while yield—the number of students accepting an offer of admission—increased from less than 30 percent to more than 55 percent during that same period of time.

Demographics have also shifted: 36 percent of the school's Class of 2026 are women, while nearly 27 percent are underrepresented minorities.

We spoke with students and alumni to learn how their experiences at Northwestern Engineering supported and guided their journey to become whole-brain engineers.

AS TOLD TO BRIAN SANDALOW

Segal Design Institute

Endowed by Gordon and Carole Segal in 2007, the Segal Design Institute significantly expanded Northwestern Engineering's undergraduate design curriculum and supported design research.



SHANE DOLAN

Mechanical Engineering ('22)

Program Manager

Tesla



Like all first-year engineering students, I enrolled in the Design Thinking and Communication course sequence offered by the Segal Design Institute. DTC provided me with invaluable exposure to some of the most fundamental concepts in engineering. The distinguished faculty instructed us on the essential phases of the engineering design process, emphasizing the significance of communicating our ideas proficiently to stakeholders, teammates, classmates, and other invested parties. DTC fortified my understanding of the primary stages of observation, ideation, and validation, laying the groundwork for acquiring critical skills, such as conceptual sketching, efficient user testing, and iterative design.

These skills proved foundational in my subsequent coursework at Northwestern. Through Segal courses, I communicated effectively with clients and users, which facilitated the development of user-centric solutions. My early exposure to the advanced manufacturing tools and equipment in the Segal prototyping shop was crucial in designing a prototype intelligent sprinkler device to help farmers more efficiently use water. These experiences taught me lessons I use today to address design problems and coordinate with team members at Tesla.

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SHANE DOLAN Mechanical Engineering ('22)

“FOUNDERS WEAR MANY HATS, SO THESE BROAD EXPERIENCES HAVE ESTABLISHED A ROBUST FOUNDATION TO TACKLE CHALLENGES I MIGHT FACE INSIDE OR OUTSIDE THE CLASSROOM IN THE FUTURE.”

• **KEVIN KASPAR** Manufacturing and Design Engineering ('24)

Farley Center for Entrepreneurship and Innovation

Supported by a gift from the late James Farley ('50) and his late wife Nancy, the Farley Center was established in 2008 to foster entrepreneurship across the university. Today, Farley serves more than 1,000 students annually and offers more than 30 courses.

Computer Science

To meet the growing demand for computer science at Northwestern, the McCormick School of Engineering launched the CS+X initiative in 2016. With plans to hire 20 faculty—including 10 appointments structured as collaborative joint appointments with other disciplines such as education, journalism, and robotics—the initiative also led to significant reimagining and expansion of teaching efforts and the development of dedicated teams of teaching faculty and peer mentors.



PETER ZHONG

Computer Science ('22)

Incoming PhD Student, Computer Science

Carnegie Mellon University



A Northwestern computer science education is not just about teaching students how to code, write a database, or write a compiler. There is an institutional focus on treating CS as a discipline of engineering and applying an engineering mindset to it. Professors emphasize the importance of writing clean code and that development should be test-driven. I have carried this mindset with me to both my research and industry jobs.

The community fostered by the faculty is welcoming and impactful. As a first-year student, I was amazed by the wealth of research opportunities. Faculty were genuinely interested in mentoring students like me who had limited experience in CS research.

Similarly, there is a wealth of teaching opportunities—even for its undergraduates. The professors I peer-mentored for didn't just ask me to manage office hours, they helped develop my teaching skills. I ran discussion sections, and professors gave me constructive feedback on how to best communicate course materials. As someone who aspires to potentially become a college professor, I found it invaluable to get such experience so early in my academic career.



KEVIN KASPAR

Manufacturing and Design Engineering ('24)



Studying entrepreneurship through the Farley Center has taught me how to think critically about how the product development cycles of hardware and software technologies occur alongside the business model and scalability of a startup. The center has been especially supportive in helping me launch InfernoGuard, a startup wildfire detection and notification platform. I created the pitch deck for my company in Farley's Principles of Entrepreneurship course, which gave me unique insight into building the foundations of pitch decks. InfernoGuard has since won multiple collegiate startup competitions, including Northwestern's 2022 VentureCat pitch competition.

Through the Farley Center, I have also gained experience in areas such as team building, managing coworkers, sales, marketing/branding, and many more. Founders wear many hats, so these broad experiences have established a robust foundation to tackle challenges I might face inside or outside the classroom in the future.

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• **PETER ZHONG** Computer Science ('22)

Student Groups

Northwestern Engineering student groups foster community and allow students to apply skills learned in the classroom to innovate, advocate for causes, and hone leadership and teamwork skills used in their careers.

Women in Computing



HELEN ZHU

Computer Science ('25)

Historian

Women in Computing

Women in Computing has been an invaluable resource throughout my career at Northwestern. I have fostered a network of peers, mentors, and friends who provided advice and encouragement when I needed it. I also developed leadership skills by serving on WiC's executive board, organizing events, maintaining its website and external communications, and mentoring students. I gained so much from mentors and friends older than me, and I strive to pass on that experience and knowledge to the next generation of women in computing.

Through WiC, I have also attended conferences, hackathons, speaker events, and workshops. These opportunities connected me with industry professionals and peers who have helped guide my academic and professional journey. These experiences have paid off—I've gained the technical and soft skills that have been essential to my growth as an engineer and professional in any field. I am grateful to Dean Ottino and the computer science department for supporting WiC at Northwestern.

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• **HELEN ZHU** Computer Science ('25)

"DEAN OTTINO WAS THE FIRST PERSON WHO BELIEVED IN ME AS AN ENGINEER AND ENCOURAGED ME TO FLOURISH INTO A LEADER IN THE UNITED STATES."

• **MERT ISERI** Entrepreneurial Design ('11)

Design for America

Founded at Northwestern in 2009, Design for America teaches human-centered design to young adults and community partners through student-led design studios. During the next decade, DFA became a national network comprising 38 programs. The organization was transitioned to the Watson Foundation in 2020.



MERT ISERI

Entrepreneurial Design ('11)

Cofounder, Fellow

Design for America

"Do the things that cannot be done." I remember staring at that sentence after Dean Ottino spoke to me and a room full of young engineers during my first year at Northwestern Engineering.

Fast-forward two years later, I had just cofounded a new student group on campus with my friends called Design for America. I had no idea what we were going to do, but I knew how it made me feel in my gut. This is what I left Turkey for. This feeling was the gift that I was chasing. The exhilarating feeling of discovery. Above any technical skills I picked up during my time at Northwestern, I learned the ability to fan the flame of starting something new.

In the decade that followed, DFA thrived, expanding to dozens of chapters across the country supported by more than 1,000 student members, all focused on tackling social challenges using design thinking.

DFA also spurred my own startup adventures. I failed, failed again, and succeeded with SwipeSense, a company whose hand hygiene improvement tool for hospital settings was borne out of a DFA project. The experience made me appreciate my journey as an entrepreneur as much as the destination many times over.

Dean Ottino was the first person who believed in me as an engineer and encouraged me to flourish into a leader in the United States. Without his support, there is no DFA. Without DFA, there is no SwipeSense. Without SwipeSense, there is no Mert Hilmi Iseri.



1 Northwestern's Women in Computing chapter at the Grace Hopper Celebration in 2019.

2 Three Northwestern Baja cars at the Winter Baja race in Houghton, Michigan, in 2023.

3 Students from Design for America chapters from across the country attend the DFA Leadership Studio at Northwestern in 2016.

Northwestern Baja Racing



LAURA FERRUCCI

Mechanical Engineering ('23)

Project Manager

Baja Racing 2022-23



"BAJA TAUGHT ME COUNTLESS LESSONS AND SKILLS, INCLUDING HOW TO BE A RELENTLESS, ASSERTIVE, BUT EFFECTIVE LEADER. I ALSO LEARNED ABOUT THE IMPORTANCE OF TEAMWORK."

Building a car is a huge undertaking and requires knowledge of unexpectedly vast breadth and depth. Engineers on Baja are both designers and manufacturers, enjoying the full scope of the engineering experience. Each member in charge of a project must understand not only the theory of how a component should function, but also how it should be modeled such that other team members can interpret and integrate it into their designs. We also must understand manufacturing and assembly processes so we can make components with the level of precision necessary for a safe, drivable, competitive car.

Baja taught me countless lessons and skills, including how to be a relentless, assertive, but effective leader. I also learned about the importance of teamwork. At minimum, we must communicate with one another well enough to assemble our car, but strong teamwork is essential to organize a project across time. These are skills that I will use long after graduation.



Student Development

To foster student success inside and outside the classroom, Northwestern Engineering has launched flexible study programs and academic programming designed to promote well-being and mindfulness.

Personal Development StudioLab

Launched in 2007 as the Office of Personal Development, the Personal Development StudioLab offers students unique courses and programming in areas such as emotional intelligence, improv, and swing dancing as a way to support student well-being, mental health, and curiosity.



VICTOR AGABA

Industrial Engineering ('25)

"I'M A MORE MINDFUL ENGINEER BECAUSE OF THE COURSES I'VE TAKEN IN STUDIOLAB. I HAVE LEARNED TO USE MY CONNECTION WITH THE ENVIRONMENT AROUND ME TO ADD VALUE TO WHAT I ALREADY KNOW."

Through courses like Engineering Improv and PATH (Personal Academic Tactical Help), the Personal Development StudioLab has taught me to appreciate what is in my control and the joy of not taking myself too seriously.

StudioLab has also helped me communicate more effectively. I don't hold myself to unnecessarily high standards of articulation—I can get the point across. Sometimes that means using hands more than words. Sometimes that means speaking a different language. What matters is that I focus more on communication than speech.

I'm a more mindful engineer because of the courses I've taken in StudioLab. I have learned to use my connection with the environment around me to add value to what I already know. However, how much I know as an engineer doesn't matter if I can't meaningfully communicate it to others. That's how impact is made. And that's what mindfulness is helping me achieve every day.

McCormick Integrated Engineering Studies Major

While the interests and aspirations of most undergraduate students in McCormick are well-supported by its departmental degree programs, Northwestern Engineering launched the McCormick Integrated Engineering Studies program so undergraduates could develop an individualized engineering degree program to explore new, emerging connections between existing academic fields.



SOPHIE FURLOW

Biomedical Computation ('23)

My MIES degree has prepared me to pursue a career in computational bioengineering. I've always been drawn to interdisciplinary work, where I can use my love for math and computing to advance biotechnology. My background covering the integration of several fields has helped make me a competitive candidate for positions at the front lines of computational innovation in biology.

The MIES program has also let me take advanced courses in a variety of different departments. I've found that each department has a unique style of teaching, and pursuing a MIES degree has taught me how to think like different types of engineers. When I'm solving a problem, I have the tools to attack it as a computer scientist, industrial engineer, applied mathematician, or biological engineer.

Every classroom is a setting to work my brain in a new way and put on a different engineering hat. I've become a better engineer by weaving these modes of thinking together and forming unlikely bridges between fields.

"I've become a better engineer by weaving these modes of thinking together and forming unlikely bridges between fields."

SOPHIE FURLOW Biomedical Computation ('23)

■ Expanding the Footprint of Master's Programs

During Dean Julio M. Ottino's tenure, professional master's degree programs at Northwestern Engineering have surged. The school has launched or reimagined eight master's programs—some in collaboration with other schools or institutes at Northwestern—that respond to burgeoning industry opportunities and challenges in analytics, artificial intelligence (AI), energy, robotics, and more.

● MASTER OF SCIENCE IN ENGINEERING DESIGN INNOVATION LAUNCHED: 2007

Students learn a human-centered approach to address design challenges. This deeply immersive program in design thinking—an innovative process of user observation, visualization, rapid prototyping, and iteration—prepares graduates to lead cross-functional teams and design groundbreaking new products and services.

■ MASTER OF SCIENCE IN ANALYTICS LAUNCHED: 2011

Students learn the skills that drive business success in a data-driven world through a unique curriculum that explores three areas of analytics: predictive (forecasting), descriptive (business intelligence and data mining), and prescriptive (optimization and simulation).

● MASTER OF SCIENCE IN EXECUTIVE MANAGEMENT FOR DESIGN AND CONSTRUCTION LAUNCHED: 2012

Designed for emerging leaders with eight or more years of experience in architecture, engineering, and construction, this program emphasizes the enhanced skills, strategies, and insights needed to become successful senior leaders in the design and construction industries.

● MMM PROGRAM REDEFINED: 2014

The first dual-degree program for innovation, the program's 2014 overhaul added a new MS in Design Innovation degree conferred by Northwestern Engineering that focuses on design research, problem framing, and concept development. Graduates also earn an MBA from the Kellogg School of Management.

● MASTER OF SCIENCE IN ROBOTICS

LAUNCHED: 2014

This program prepares the next generation of roboticists by bridging the knowledge and experience gap between undergraduate robotics curriculum and industry needs through hands-on learning that develops expertise in computer science, mechanical engineering, electrical engineering, biomedical engineering, and mathematics.

■ MASTER OF SCIENCE IN ARTIFICIAL INTELLIGENCE

LAUNCHED: 2018

Created to meet the demand from industry for computer scientists who understand AI systems and the problems they can solve, the program equips students with the skills to create powerful AI systems that integrate with workflows, business applications, and human interactions.

● MASTER OF SCIENCE IN ENERGY AND SUSTAINABILITY LAUNCHED: 2020

Developed with the Institute for Energy and Sustainability at Northwestern, this program expands the University's internationally recognized strengths in energy sciences research. Students navigate the complex intersection of technology, economics, and regulation in the growing industries associated with sustainability and energy innovation and leadership.

■ MBAi PROGRAM LAUNCHED: 2021

This joint-degree program with the Kellogg School of Management responds to the growing and global need for leaders who can spearhead strategic, business-driving innovation while understanding the complexities and nuances of the technologies—such as artificial intelligence and machine learning, robotics, and computational thinking—that enable it.



Alumni: Where Are They Now?

Read about Northwestern Engineering alumni who are applying their whole-brain education to guide their success.