



NDSU



COLLEGE OF
ENGINEERING



FALL NEWSLETTER
NORTH DAKOTA STATE UNIVERSITY


20
21




More than 40 area high school students experienced NDSU during our two-day BisonCyber Day Camp. The camp included hands-on activities in programming, networking, cybersecurity and robotics.

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ON THE COVER

Students and faculty work with a new robotic robot donated by Doosan Bobcat to support the College of Engineering's robotics minor.



DEAR ALUMNI AND FRIENDS OF THE COLLEGE OF ENGINEERING,

Every autumn for the past 29 years, I have experienced the excitement of a new academic year on a college campus. However, this year I'm sharing it from a new perspective. This August, my wife and I moved our oldest son into his dorm to begin his college career – saying goodbye was filled with many emotions.

Here at NDSU, I think all of us are viewing the start of a new year with a different perspective after the challenges created by the COVID-19 pandemic. There is certainly excitement on campus about the more “normal” fall. Students and faculty are back in the classroom, events like Welcome Week, our Scholarship and Awards Reception and Homecoming are back on the schedule, and, of course, football is back at the Fargodome.

There also is some apprehension about what the next few months have in store, and the university has taken several steps to keep our campus community safe and healthy, including encouraging everyone to get vaccinated, requiring masks in classrooms and reminding people to stay home if they feel sick.

COVID has not been the only challenge facing us during the past year, I am sure many of you have seen the news stories about declining enrollment at NDSU and I want you to know that increasing the number of students in the College of Engineering is a priority.

While overall enrollment in the College of Engineering and at NDSU is down compared to last year, we are seeing signs the trend is turning around. Our incoming class is the largest since 2018 and we are making significant gains in our efforts to increase diversity in the college. The number of women in our incoming class is up 44% and the number of persons of color is up 73% compared to fall 2019.

We're also proud to report a record number of graduates from the College of Engineering in the past academic year with more than 600 degrees awarded. We know that engineers, computer scientists and construction managers are in demand around our state and region, and we have made it our mission to prepare the next generation of leaders in those key areas.

As North Dakota's land-grant university, it's also our mission to create new knowledge that makes lives better here and around the world. In fiscal year 2021, researchers in the College of Engineering were awarded more than \$11.1 million in grant funding, a new record. The money is being used to find solutions to some of the greatest challenges facing our society.

Thank you for your support for the College of Engineering. Go Bison.

Michael R. Kessler

Dean, NDSU College of Engineering



LEARNING TO MAKE LIVES BETTER

At the NDSU College of Engineering you can learn as you help others.

That was the goal of an extraordinary senior design by Krystal Jamison, Ashley Jacobson, Amber Younggren and Sonny Bawi.

A friend of theirs had complaints about her wheelchair – it didn't match her body shape, the design wasn't right for her active lifestyle and it cost about \$20,000.

So the mechanical engineering majors went to work to design a new and very improved model.

"With this chair that we built for her, it's customized to her physical dimensions, her daily use and needs and cost around \$2,000," Jamison said. "The best part is that our friend got a say in the design of her wheelchair; it's much stronger and resistant to wear than her old wheelchair, and she did not have to pay anything for this chair."

The students improved the stiffness of the chair's back support, moved the chair's wheels for better stability and put the footplate in a more comfortable position.

The project was a great hands-on learning effort for everyone involved.

"I like it because it was a realistic experience," said Bawi, who plans to design another wheelchair for his brother-in-law. "The process we went through was really close to the actual process in industry."

"Engineers are problem solvers," said Younggren. "This is great practice to what we will be doing in the future."

Jamison said, "It has been terrific working with teammates and a mentor who are all excited and dedicated to this project. I would definitely recommend NDSU for any prospective engineering student."



ARMING

STUDENTS WITH THE LATEST TECHNOLOGY

Doosan Bobcat North America (Doosan Bobcat) is helping outfit the College of Engineering's state-of-the-art robotics lab with the donation of a new robotic cobot and two previously-used robotic arms.

"We are proud to partner with NDSU to provide its students with innovative resources and equipment for hands-on learning opportunities and foster the next generation of robotics and engineering professionals," said Nicol Winkelman, vice president of human resources at Doosan Bobcat North America. "As a company built on decades of engineering advancements, Doosan Bobcat is committed to investing in and developing the talent pool that will shape the next century of innovation."

The College of Engineering launched a robotics minor in fall 2020. Students say they're excited about this opportunity to better prepare them for future careers.

"Robotics has a special place in my heart because it incorporates everything — mechanical engineering, electrical systems and computer programming," NDSU senior Courtney Hassler said. "I like the whole process of what goes into a machine."

As robotic systems continue to develop across industries, this minor, along with a dedicated learning space, allows NDSU to meet the needs of students, employers and the community.

"There's been rapid growth in the need for engineers and computer scientists with the technical skills to work in the field of robotics," Michael Kessler, dean of NDSU College of Engineering, said. "Our minor offers extensive hands-on learning activities that directly relate to real-life applications."

Philanthropic support for campus facility upgrades is part of In Our Hands: The Campaign for North Dakota State University, which has raised more than \$430 million for student scholarships, faculty research support, facilities, and student programs.

"Building state-of-the-art learning spaces is a necessity in today's world," John Glover, NDSU Foundation president and CEO, said. "With this gift, Doosan Bobcat will empower NDSU Engineering to transform its teaching and better equip NDSU graduates with the skills they need to lead future industry innovations."



STUDY ABROAD OFFERS DIFFERENT WORLDVIEW

THE COLLEGE OF ENGINEERING ENCOURAGES STUDENTS TO PURSUE RICH EXPERIENCES THAT WILL HELP THEM GROW THEIR SKILLS BEYOND THE CLASSROOM.

Will Odland, an industrial engineering and management student, participated in two study abroad trips to Europe.

Odland chose NDSU's Global Seminar Program, which combines on-campus coursework with two-week learning experiences abroad during the university's winter, spring or summer break.

"One of the benefits I experienced was developing a global mindset," Odland said. "Thanks to my study abroad experiences, I am more aware of cultural nuances, more flexible and better at communicating with a diverse set of co-workers."

During her time at NDSU, civil engineering graduate Gina Blazanin completed a semester-long structural engineering internship in Pisa, Italy.

The internship allowed her to develop a unique skillset beyond technical skills and an appreciation for and interest in other cultures.

"Being abroad opened my eyes to how connected the world really is," Blazanin said. "And having international work experience so early in my career is definitely something employers notice."

For students who love to travel, experience new places and learn a global perspective, NDSU has several impactful study abroad opportunities. Peer mentors also are available to help students plan and navigate through the process.

"Studying abroad was an experience I wanted to have before graduating college because I wanted to see the world," said Yasser Ayeva, an electrical engineering student who studied at Université Savoie Mont Blanc in France. "My experience was unique and challenging because of the global pandemic, but it did not stop me from meeting and working with new people from different cultures, trying new food, getting out of my comfort zone and, most importantly, expanding my network for future job opportunities."

Study abroad experiences are available for any major and for a variety of lengths of time.

Will Odland



Gina Blazanin



Yasser Ayeva

ALUMNI NEWS

INTERNSHIP LEADS TO SUCCESSFUL CAREER



Hannah Holte's degree in industrial engineering and management from NDSU has led to a Sanford Health career where she can pursue her many analytical talents.

Holte wanted to apply the principles learned in class to the world of health care, and she quickly learned that idea would be her path to success. An internship at Sanford Health as a student paved the way for full-time employment.

Her journey started when her older brother recommended she pursue a degree in engineering. They shared a similar passion of digging into a problem to find the optimal solution, and Holte's brother explained the endless employment options available with this type of degree.

"Engineering is so free and creative. It's not pure memorization and multiple-choice answers. There are many possibilities of getting to and finding the best possible solution," Holte said.

Holte tested her logic-based mindset and problem-solving abilities at NDSU. The industrial engineering program helped her learn the tools and principles to optimize a complex process.

"I really enjoy digging into a process and working with a variety of teams to understand and map out who is involved, what steps are needed, how the work is being done and determining the pain points deterring teams from meeting their goals," Holte said.

She credits NDSU's College of Engineering for preparing her for the real world, offering opportunities to work with local businesses and internships that could ultimately lead to a permanent career.

"NDSU has ample opportunities for students interested in the field of engineering," Holte said. "There are many different engineering student groups that allow you to tour and network with area businesses and apply what you're learning in class to real-world examples. But none of this is required, so it's important to be proactive and push yourself to maximize the opportunities available for you."

FIND OUT HOW YOU CAN GIVE BACK TO THE
COLLEGE OF ENGINEERING: [NDSU.EDU/COE/ALUMNI](https://www.ndsu.edu/coe/alumni)

COLLEGE OF ENGINEERING HONORS DISTINGUISHED ALUMNI



Borman

NDSU alumni Nick Borman and Hugh McDonald were named recipients of the College of Engineering's Distinguished Alumni Award in 2021.

Borman, who graduated with a bachelor's degree in mechanical engineering in 1984, is the senior vice president of engineering and construction at Tenaska, one of the leading independent energy companies in the United States.

In his role at Tenaska, Borman is responsible for overseeing project planning and execution for environmental permitting, engineering and construction of new energy facilities, including advanced technology power generation, electric transmission, natural gas midstream, energy storage and renewable energy projects.

He is a registered professional engineer and a member of the American Society of Mechanical Engineers.



McDonald

McDonald, a 1980 graduate of the construction management program, served as president and chief executive officer of Entergy Arkansas Inc. from 2000 until his retirement in 2016.

He joined Entergy in 1982 and held various management positions in the distribution, transmission, customer service, retail marketing and regulatory business functions in Louisiana, Mississippi, Texas and Arkansas.

McDonald currently serves as chair of The Nature Conservancy of Arkansas and trustee for the NDSU Foundation.



FAST TRACK TO SUCCESS

The NDSU Formula Electric Team, a group of 15 active student members, are building what is described as a “shrunk down, open-wheeled Indy-style race car.”

The electric-powered car is being designed and constructed specifically for an international competition put on by the Society of Automotive Engineers. The team’s goal is to have the car ready for the event in late spring 2022.

“This club has helped me connect my passion for motor sports with my degree, and to realize that they can co-exist,” said Jordan Baker. “I’m personally getting a lot of experience, and I think it really helps team members prepare for their first internship or first job.”

NDSU has historically competed in the SAE combustion engine competition, and this is the club’s first electric car. The worldwide event really puts the competitors to the test, with a technical inspection; student presentations; and acceleration, skid pad, autocross and endurance events.

“Taking part in SAE and this club helps bridge the gap between what you learn in the classroom and how to apply it in the real world,” said Baker, who is interning for Polaris Inc. and hopes to be a design engineer for the company after graduation. “That’s a huge thing for me; it gives you a head start so you can hit the ground running.”

COLLEGE HAPPENINGS PREPARING LEADERS

The NDSU College of Engineering develops innovative problem solvers and leaders ready to take on some of the world’s greatest challenges.

In construction management and engineering, a sustainable design and construction course prepares students to be green-building leaders and sustainability-focused citizens. Students learn how to reduce the carbon footprint and implement cost-saving efforts on building projects.

“Opportunities like this allow students to get the most out of their education and be prepared for what the industry is like,” said construction management major Nicholas Jensen.

“Pursuing a LEED certification for a building is usually the job for building professionals,” said Yao Yu, assistant professor of engineering. “In this course, all the work is done by students.”

Successful completion of the course prepares students for specialty LEED exams that many other recent college graduates aren’t ready for because of inexperience.



ENGINEERING TEAM WINS INTERNATIONAL VIDEO CONTEST

A team of NDSU graduate students won the American Society of Agriculture and Biological Engineers’ One-Minute Video Competition. The video introduces “The New Faces of ASABE,” giving an international perspective on how agriculture and biological engineers help feed the world as they use cutting-edge technology to solve problems in agriculture.

The competition was open to all society members age 35 and under. Entries were judged on content, strength and clarity of message, creativity, production quality and effectiveness of time used.

Team members include:

- Billy Graham Ram, doctoral student from Gwalior, India
- Nitin Rai, doctoral student from Varanasi, India
- Diego J. Gris, master’s degree student from Palotina, Brazil
- Harsh Pathak, master’s degree student from Prayagraj, India
- Bleck Tita, master’s degree student from Limbe, Cameroon



SCHOLARSHIP AND AWARDS CELEBRATION

The College of Engineering held its 4th annual Scholarship and Awards Celebration Sept. 10 to recognize student scholarship recipients, thank scholarship donors and honor faculty and staff award winners. This year, the college awarded more than \$1 million in scholarships to current and incoming students.

2021 college award winners:

- Excellence in Research Award – Ying Huang
- Early Career Research Excellence Award – Ravi Yellavajjala
- Graduate Research Assistant of the Year – Dayakar Lavadiya
- Excellence in Teaching Award – Joseph Latimer
- Early Career Teaching Excellence Award – Danling Wang
- Graduate Teaching Assistant of the Year – Lauren Singelmann
- Outstanding Staff Award – Alissa Kuntz
- Outstanding Staff Award – Tanya Erickson

NEW DEPARTMENT, SAME GREAT PROGRAMS

The NDSU College of Engineering announced the creation of the Department of Civil, Construction and Environmental Engineering on July 1. The new department was formed with the merging of the Department of Civil and Environmental Engineering and the Department of Construction Management and Engineering.

Xuefeng Chu has been named the interim chair of the new department. Chu previously was the interim chair of the Department of Civil and Environmental Engineering and has served as director of the North Dakota Water Resources Research Institute since 2018.

The goal of the new department is to organize faculty from closely aligned programs into a common department to better prepare students for the types of interdisciplinary interactions they will face on the job, while maintaining their important disciplinary understanding and methods.

FACULTY AWARDS

VOLD AWARDED NATIONAL FELLOWSHIP



Jessica Vold, assistant professor of engineering entrepreneurship and innovation, has been named an Engineering Unleashed Fellow for her leadership in undergraduate engineering education.

Vold is one of 27 individuals from higher education institutions across the country named fellows in 2021.

YELLAVAJJALA RECEIVES CAREER AWARD



Ravi Kiran Yellavajjala, assistant professor of civil, construction and environmental engineering, has received a National Science Foundation CAREER Award, considered the agency's most prestigious award in support of early-career faculty.

The grant will fund research, hands-on learning experiences and outreach activities to increase the participation of Native Americans in science, technology, engineering and math.

RUSCH NAMED TO SELECT NSF COMMITTEE



Kelly A. Rusch, North Dakota Established Program to Stimulate Competitive Research executive director and professor of civil, construction and environmental engineering, has been selected by the National Science Foundation as one of 19 national experts to serve on the "Visioning the Future of NSF EPSCoR" committee.

AMIRI SELECTED FOR PRESTIGIOUS TEACHING AWARD



Ali Amiri, assistant professor of practice in the mechanical engineering department, has been selected for NDSU's prestigious Odney Excellence in Teaching Award.

Amiri was nominated by his students and chosen by a committee of his peers.

PROMOTIONS

PROMOTED TO FULL PROFESSOR:

- ▶ **Achintya Bezbaruah**, civil, construction and environmental engineering
- ▶ **Saeed Salem**, computer science
- ▶ **Sudarshan Srinivasan**, electrical and computer engineering

PROMOTED TO SENIOR LECTURER

- ▶ **Joe Latimer**, computer science

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