



NDSU

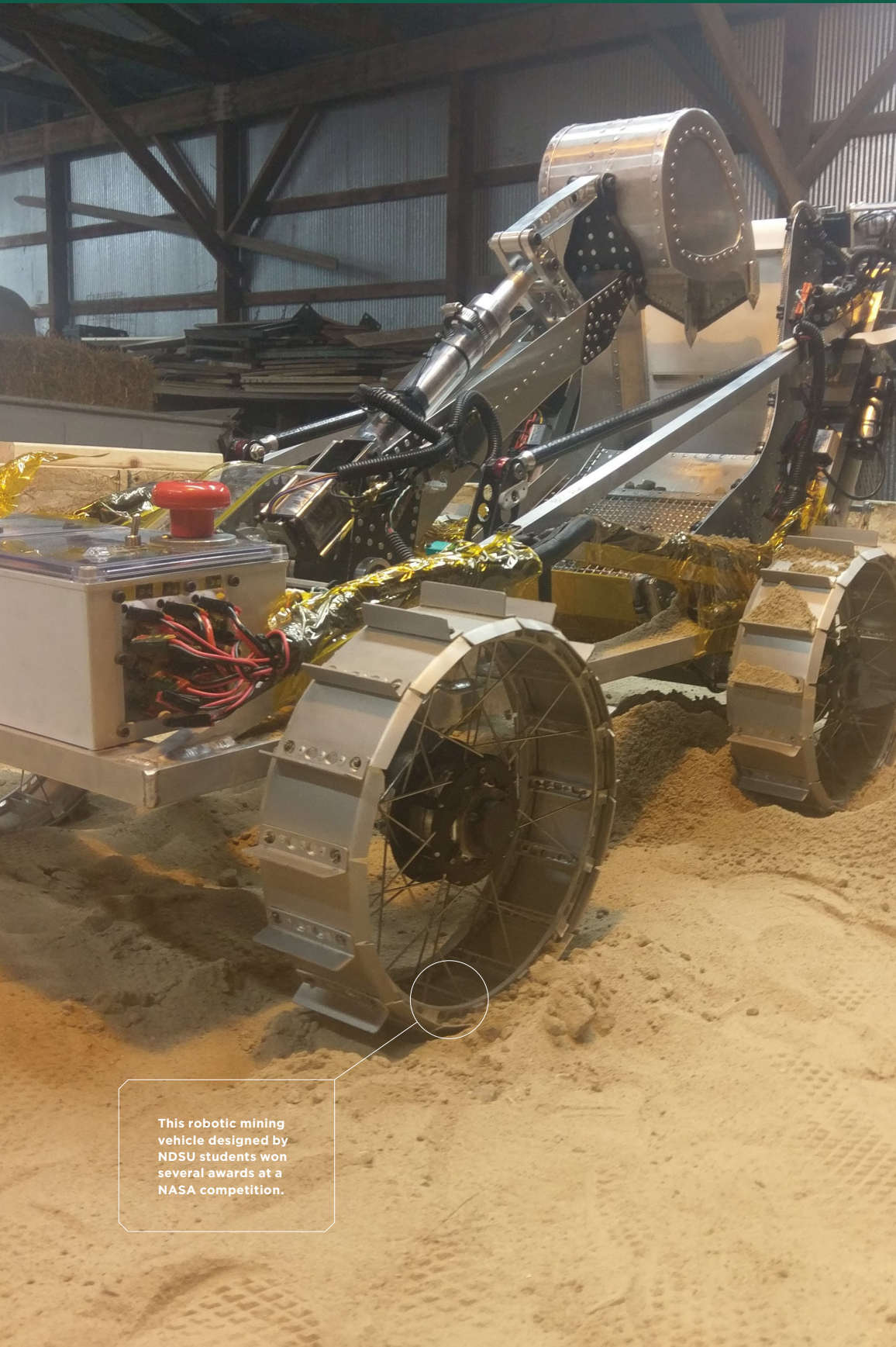
COLLEGE OF
ENGINEERING

FALL NEWSLETTER
NORTH DAKOTA STATE UNIVERSITY

20
18

ON THE COVER

Adam Stolt, MS '18, mechanical engineering, monitors a wind tunnel laser experiment in the Tomographic Particle Image Velocimetry lab. As part of his research on smart materials for aircraft Stolt designed a wing to change its shape during flight to optimize to changing wind conditions.



This robotic mining vehicle designed by NDSU students won several awards at a NASA competition.

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FROM THE DEAN

DEAR ALUMNI AND FRIENDS OF THE COLLEGE OF ENGINEERING,

It's a wonderful time to be on campus at NDSU. The planters and sidewalks are both full of life, with summer's flowers still in full bloom and students hurrying to and from class. The start of the fall semester is also full of exciting new beginnings for our incoming class of nearly 500 College of Engineering students.

We're also excited about some new faces on our leadership team this year. David R. Steward is the new chair of the Department of Civil and Environmental Engineering, David Grewell is the new chair of the Department of Industrial and Manufacturing Engineering, and Benjamin Braaten is the new chair of the Department of Electrical and Computer Engineering. You can read more about them on the next page.

One of my first initiatives after joining the college last year was to hire permanent chairs to lead our departments and with the leadership team in place we have begun a strategic planning process to layout the vision and mission for the College of Engineering. Our goal is to build upon the strong foundation of success and take the college to the next level.

Speaking of taking things to the next level, you may have noticed our college website underwent a significant upgrade over the summer and we're in the process of rolling out the changes to our department sites as well. Establishing a distinctive and compelling public image for the college is something I have made a priority.

That public image is certainly helped by our amazing students. Once again student teams represented NDSU engineering at events around the country and once again they turned in some impressive performances, bringing home several major awards. We all can't wait to see what innovations they come up with next.

Finally, I'd like to personally invite you to visit us here on campus anytime. It's always a pleasure to meet with alumni and friends of the college and give them an update on what we're up to.

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

NEW FACES: MEET THE NEW MEMBERS OF THE COLLEGE LEADERSHIP TEAM



Benjamin Braaten, associate professor, has been appointed chair of the Department of Electrical and Computer Engineering. Braaten has served as the interim chair of the department since August 2017.

Braaten joined the NDSU faculty full-time in 2010 and is director of the Applied Electromagnetics Laboratory. In that time, he has secured nearly \$2 million in research funding, established collaborations with industry partners and has been an adviser and mentor to hundreds of students.

Braaten, who is from Rhame, North Dakota, earned his bachelor's, master's and doctoral degrees in electrical engineering from NDSU.



David R. Steward is the new chair of the NDSU Department of Civil and Environmental Engineering and was awarded a Walter B. Booth Distinguished Professorship.

Steward, who was a professor of civil engineering at Kansas State University, led interdisciplinary teams studying the grand challenge of water resources, secured more than \$15 million in research grants as lead or co-principal investigator and taught courses in groundwater flow and analysis, hydraulics, engineering, mathematics and water-and-society.

Steward is a fellow in the American Society of Civil Engineers, a registered professional engineer in Minnesota and is widely published in his field.



David Grewell was named chair of the NDSU Department of Industrial and Manufacturing Engineering and awarded a Walter B. Booth Distinguished Professorship.

Grewell comes to NDSU from Iowa State University where he founded, directed and developed a highly successful National Science Foundation Industry/University Cooperative Research Center focused on bioplastics and biocomposites. The center has secured millions of dollars in grants and created new, long-term partnerships between academics and industry.

He is a fellow of the Society of Plastics Engineers, serves as the United States' representative for the International Institute of Welding and edited the Plastics and Composite Welding Handbook.



The NDSU student group Engineers Without Borders is working to change lives for people in a small town in Guatemala.

GLOBAL OUTREACH: ENGINEERING STUDENTS CHANGE PEOPLE'S LIVES IN GUATEMALA

NDSU's chapter of Engineers Without Borders has been working in the village of Las Tablitas since 2011, sending teams to work with the community on a water distribution system and a new schoolhouse. Now, they've turned their attention to designing and building a new community center.

The building will be used for meetings, as a place for medical teams to provide volunteer medical assistance and as a general space for the community to use as needed. For the past several months, teams of NDSU students have been working on the structural, water, sanitation and solar energy designs.

Engineers Without Borders is a nonprofit organization that partners with developing communities across the world, working towards improving the quality of life through the design and implementation of sustainable engineering projects.

A CURE FOR CANCER HAS BEEN ELUSIVE, BUT A TEAM OF NDSU SCIENTISTS BELIEVE IT IS WELL WITHIN REACH.

Civil engineering professor Kalpana Katti helped pioneer a way to use clay to generate material that closely resembles human bone. That innovation will be used as the foundation of the NDSU Center for Engineered Cancer Test Beds. The center is part of the university's Grand Challenge Initiative, which focuses NDSU's research expertise and resources on solving some of the world's most complex problems.

"I think cancer touches everyone's life," Katti says. "My mother was diagnosed with cancer when I was in graduate school. I think every member of this project has been affected by cancer on some level. We all know someone who has battled the disease."

There are more than 1.6 million new cancer cases each year. One in eight women will develop breast cancer. One in seven men will be diagnosed with prostate cancer. And breast and prostate cancers are the most likely to spread to a patient's bones, making treatment difficult.

The goals of the Center for Engineered Cancer Test Beds are enormous. Provide relief to patients. Speed up the time it takes for cancer drugs to get to market. Stop the disease even if it has spread to bone. Cure cancer.

The effort includes renowned NDSU scientists, as well as graduate and undergraduate students. The students, Katti says, will be a vital part of the project's success.

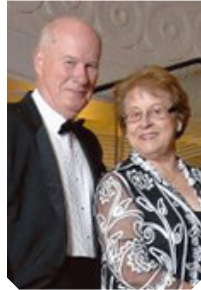


NDSU researchers take new approach in cancer fight



ALUMNI NEWS

DONALD NELSEN MEMORIAL SCHOLARSHIP ENDOWMENT



Donald and Jeanne Nelsen

NDSU opened up a world full of opportunity for Donald and Jeanne Nelsen. After earning their degrees and getting married, the Nelsens embarked on a life that took them around the world.

Donald graduated from NDSU with a degree in civil engineering in 1967. Not long after, he began a 32-year career with the global oil and chemical company, Amoco Corp.

“Donald really appreciated the degree he got at NDSU,” said Jeanne, who earned a bachelor’s degree in home economics education. *“He always thought that his NDSU education prepared him to do his job very well.”*

After Donald died in 2015, Jeanne decided to establish the Donald Nelsen Memorial Scholarship Endowment, an annual scholarship to be awarded to an NDSU engineering student.

“I thought the scholarship would be a great way to give back and to honor Donald,” Jeanne said. *“We would not have the life we had if Donald didn’t graduate from NDSU.”*

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



Barry Batcheller

ALUMNI HONORED BY NDSU FOUNDATION AND ALUMNI ASSOCIATION

Barry Batcheller, BS '77, electrical and electronics engineering, honorary doctorate '10, received the Heritage Award, which recognizes an individual who has demonstrated outstanding support of time and talent to NDSU projects or activities.

Batcheller is chairman of the board of Appareo Systems, an electronics design and manufacturing company. He also founded three other successful companies, including Phoenix International Corp., which was purchased by John Deere in 1999. He was instrumental in the establishment of the NDSU Research and Technology Park and serves on its board of directors.



Bob Heller

Bob Heller, BS '68, industrial engineering, was honored with the Service Award, which recognizes dedicated service in fundraising and outstanding contributions to NDSU and the Foundation and Alumni Association.

Heller is president of Heller Capital Inc., a finance and consulting service to growing businesses. Heller spent nearly 20 years at Advance Circuits Inc., where he led the company's growth from \$3 million in annual sales to \$150 million. Heller is a member of NDSU's Old Main Society and he supports the Gordon Heller Scholarship Fund for NDSU students.



Warren Walhaug

ALUMNUS' ENGINEERING CAREER SPANS THE GLOBE

Warren Walhaug's longtime petroleum industry career has taken him from the bayous near New Orleans to the mountains of Iran and the coastline of Nigeria. And he will likely finish his career on the plains of North Dakota, developing the state's oil resources. He'll also be honored in September with the 2018 Distinguished Alumni Award from the NDSU College of Engineering.

Walhaug, BS '82, civil engineering, didn't plan on returning home to North Dakota. He was working for Shell on a \$40 billion project in Kazakhstan when his father died in 2012. While home for the funeral, Walhaug decided to drop off his resume at Hess Corp.'s Minot office. He quickly received a call and is now director of infrastructure for a company that operates more than 1,000 oil and gas wells in North Dakota.

In the process, Walhaug became the third generation of his family to live on the 110-year-old farmstead near Palermo, North Dakota. He grew up farming about an hour west of Minot. However, he was intrigued by hydraulics and building structures so he pursued engineering. He earned an associate's degree from North Dakota State College of Science in 1973.

His first overseas assignment was in Iran in 1976. He remembers beautiful mountain valleys and sharing tea with village elders. That all changed with the Iranian Revolution. Walhaug was the last member of Harza Engineering to leave the country.

“It was a crazy time,” Walhaug said. *“The last one to leave literally turned out the light and locked the door.”*

Walhaug returned to North Dakota and, as an older-than-average student, earned a bachelor's degree in civil engineering from NDSU in 1982. He was a member of the Tau Beta Phi Honor Society and the concrete canoe team. His experiences at NDSU helped shape the rest of his career.

“The faculty helped prepare me for the challenges I would face,” Walhaug said. *“Aside from the technical expertise, I also improved my communication skills and learned how to be flexible.”*

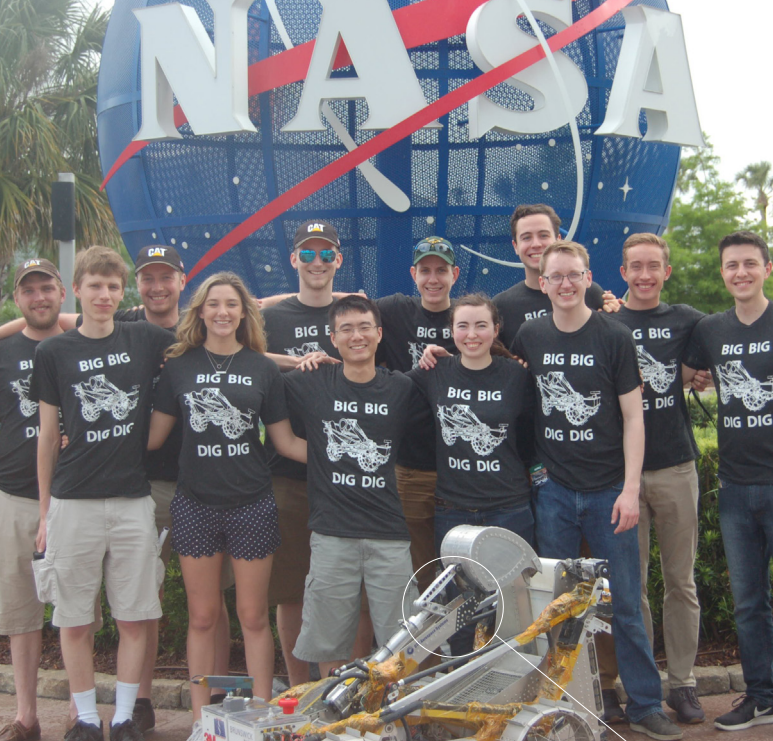
It's the same advice he gives to current students.

Seventeen of the next 31 years, with Shell, were spent overseas in places like Cameroon, Kazakhstan and Nigeria, where Walhaug took up racing sailboats. He joined a yacht club that was established in the 1920s. He mastered the art of racing a 16-foot Hobie Cat sailboat. With his wife Colleen as his “reluctant crew,” Walhaug raced throughout Europe.

The couple were European grand master champions in 2008 in Walhaug's age class. He still sails on Lake Sakakawea, which Walhaug says can produce ocean-like swells in steady 15- to 25-mile-per-hour winds.

The North Dakota Oil Patch doesn't leave much time for sailing. Hess drilled its first production well in North Dakota in 1951. A recent expansion of the company's Tioga gas plant made it one of the largest producers of propane, ethane and butane in the state.

“We're catching up,” Walhaug said. *“In terms of infrastructure development, the Bakken rivals everything I've worked on.”*



COLLEGE HAPPENINGS

NDSU ranked highly for precision ag education

NDSU is ranked among the top 25 colleges in the world for precision agriculture, according to PrecisionAg Professional magazine.

NDSU's program, led by Sreekala Bajwa, professor and chair of agricultural and biosystems engineering, was ranked 18th.

"This ranking is a testament to the strong leadership and cutting-edge work our department has been doing in addressing the research, education and extension needs in the region in precision agriculture and unmanned aerial system applications," said Bajwa. "Our extensive partnerships with industries, other departments at NDSU, commodity boards, farmers, economic development groups, other institutions and state government were all instrumental in getting us where we are today."

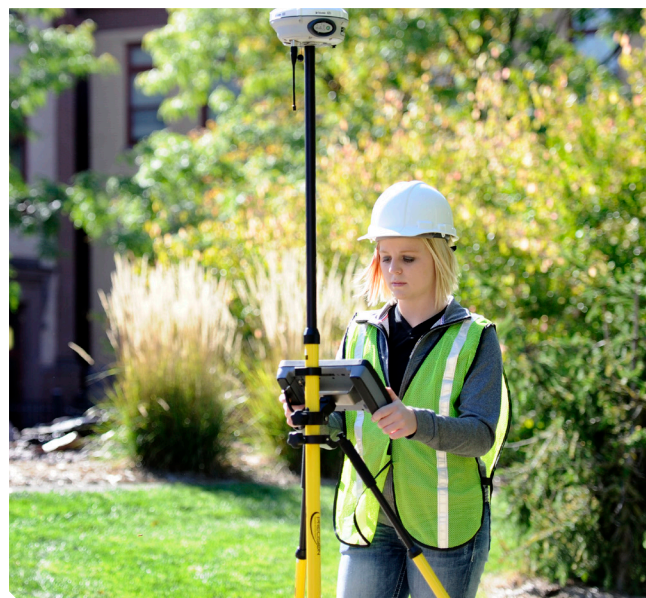
Construction management degree ranked 'best value'

A new study has ranked the Bachelor of Science in construction management degree from the NDSU Department of Construction Management and Engineering as one of the nation's best values.

Value Schools looked at the more than 100 colleges and universities that offer accredited construction management degrees, and ranked NDSU 24th overall.

"It's great to be recognized for the tremendous value of a bachelor's degree in construction management from NDSU – a student-focused, world-class education at an affordable cost," said Michael Kessler, dean of the College of Engineering.

In addition to its affordable tuition and high job placement rate, NDSU's construction management program was recognized for providing one of the most rigorous construction educations in the world and giving students access to state-of-the-art labs and equipment.



The annual competition attracted teams from more than 50 colleges and universities. Students are asked to design and build mining robots that could complete a simulated mission on another planet.

FROM FARGO TO MARS: NDSU STUDENTS WIN NASA AWARDS

An NDSU team of engineering and computer science students excelled during the NASA Robotic Mining Competition held in May at the Kennedy Space Center in Florida.

The team placed second overall and took home several honors, including:

- ▶ IEEE Judges' Innovation Award
- ▶ Slide Presentation and Demonstration Award, first place
- ▶ Caterpillar Autonomy Award, second place
- ▶ On-site Mining Award, second place

"The management of the project took a lot of cues from experiences myself and other students gained from previous internships. We tried to structure of the project similarly to a real-life engineering project using an agile software development methodology and product data management software," said Noah Curfman, a senior majoring in mechanical engineering from Fargo who is the team leader. *"The amount the team was able to accomplish because of well-thought out project organization was incredible. The experiences I gained from working within a large, multi-disciplinary group structured like a real engineering team are invaluable."*

NDSU Steel Bridge Team gains hands-on experience

The NDSU Steel Bridge Team had a successful season even though they did not bring home a seventh national title.

The team of engineering students placed fourth at the 2018 American Society of Civil Engineering Midwest Regional Student Conference.

Twelve teams competed in this year's regionals – each designed and built a steel bridge over a 6-foot river. The bridge must support 2,500 pounds without bending more than a few inches.

The team worked on their bridge for about seven months, gaining important experience in design, management, fabrication and teamwork. Lessons they will take from the classroom to their careers.

NDSU has won the national championship a record six times, in 1995, 2002, 2004, 2006, 2007 and 2010.

NDSU engineering grad starts robotics camp company

Ryan Swanson started hosting robotics camps to earn a little extra money over the summer. It was supposed to be a temporary gig, but now the company he created at NDSU could become his full-time job and inspire a whole new generation of engineers.

Swanson graduated in May with a degree in mechanical engineering. His company, COR Robotics, runs summer camps that get kids excited about science, technology, engineering and math, commonly known as STEM.

"The focus is to inspire them to pursue STEM degrees," Swanson said. "Running the camps is a ton of fun and the kids are excited about science."

COR's camps introduce grade school students to the core skills of robotics through engaging, hands-on activities. They also serve as training for FIRST, a leading non-profit STEM engagement program.



FACULTY AWARDS

Mechanical engineering chair receives Chamber Service Award



Alan Kallmeyer, professor and chair of mechanical engineering, is the recipient of the Chamber of Commerce NDSU Distinguished Faculty Service Award.

The award recognizes NDSU faculty members who have attained distinction in their profession, focusing especially on service contributions to the community and the region.

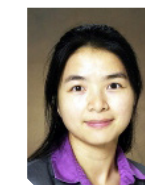
University Distinguished Professor honored with research award



Kalpana Katti, University Distinguished Professor of civil and environmental engineering, has been recognized with the Fred Waldron Research Award.

The honor was established with the NDSU Development Foundation board of trustees to recognize outstanding faculty research.

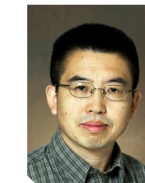
Professor wins CAREER award



Ying Huang, Professor from the Department of Civil and Environmental Engineering, has won a National Science Foundation CAREER award for \$500,000.

The prestigious honor supports faculty who exemplify the role of teacher-scholars and will provide new research opportunities for students.

Construction management and engineering chair named



Zhili "Jerry" Gao, associate professor, has been appointed to a one-year term as chair of the NDSU Department of Construction Management and Engineering. He has served as interim chair of the department since January 2017.

Gao, who joined the NDSU faculty in 2006, is director of the Concrete Materials and Performance Laboratory and the Integrated Virtual Design and Construction Laboratory.

PROMOTIONS

PROMOTED TO FULL PROFESSOR:

- ▶ Dilpreet Bajwa, mechanical engineering
- ▶ Xuefeng Chu, civil and environmental engineering
- ▶ Rajesh Kavasseri, electrical and computer engineering
- ▶ Scott Pryor, agricultural and biosystems engineering
- ▶ Chad Ulven, mechanical engineering

PROMOTED TO ASSOCIATE PROFESSOR:

- ▶ Debasis Dawn, electrical and computer engineering
- ▶ Ying Huang, civil and environmental engineering
- ▶ Zhulu Lin, agricultural and biosystems engineering

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