



# Impulse

Jerome J. Lohr College of Engineering  
South Dakota State University      Spring 2017



**IMPROVING  
INSPECTIONS**



DEAR ALUMNI AND FRIENDS,

## Build it and they will come?

Since groundbreaking for the Crothers Engineering Hall addition in 2001 through the dedication of the Architecture, Mathematics and Engineering Building in 2015, the Jerome J. Lohr College of Engineering has been placarded with “under construction” signs.

While the college still has renovation plans for Crothers, our major building needs are satisfied. As I review enrollment reports from the fall, I can’t help but remember that line from “Field of Dreams” — “Build it and they will come.”

Enrollment numbers have steadily been moving up the last five years with a particularly big jump this year (9.95 percent). Our improved and expanded facilities are certainly a part of that growth. But that’s not the only one, and part of the reason for our increased enrollment is our climbing international student population.

Rich Reid, our associate dean, has been spending a lot of time going through international airports the last couple of years. He’s not the only one advocating for our college. Oftentimes, you, our alumni, are our best recruiters.

In this issue, we take a look at our recruiting efforts and why students are choosing the Lohr College of Engineering for their undergraduate and graduate degrees.

### **New programs, new scholarships?**

Other attractions for the Lohr College of Engineering are its quality programs and people.

One of the exciting developments within the college is in the Department of Agricultural and Biosystems Engineering, where a partnership with the College of Agriculture and Biological Sciences created the nation’s first precision ag major. It has attracted a lot of attention in the trade media and we’re looking forward to how it will grow.

Speaking of partnerships, I encourage you to read about our new STEM Partnership program that was created in 2016 and supports the college’s outreach activities, such as camps and workshops for eighth-graders and high school students as well as the Engineering Expo. It’s proving to be a win-win program that has good growth potential.

Another way to partner with the college is through the sponsoring of scholarships. Scholarships given through the SDSU Foundation are a great way to honor someone you love or has made an impact on your education or career. Our growing enrollment creates a greater need for new scholarships, and, frankly, enrollment growth is outpacing scholarship growth right now.

### **Honoring those with whom I work**

In closing, let me share a little about the people of the Lohr College of Engineering. It truly is the people who are the key to any university, and I couldn’t be more proud of the faculty members and staff we have. Inside this issue, you’ll be able to read about honors several received this semester as well as meet the new faces in the college.

I would particularly like to offer my congratulations to longtime colleague Rich Reid, who was recognized March 17 as a fellow in the American Society of Civil Engineers. This high honor is held by only 3.5 percent of the group’s 150,000-plus members. Another recently recognized ASCE fellow is our head of civil and environmental engineering, Nadim Wehbe.

On a somber note, I reflect on the loss of a dear friend and colleague Alfred Andrawis. Alfred retired in 2013 as an electrical engineering professor emeritus. We taught together for many years before I became dean. I can think of no kinder and caring man with whom I have served. We continue to extend our condolences to his wife, Madeleine, and their children.

I’m hoping that many who read this column will stop in to visit when in Brookings attending year-end banquets and graduation ceremonies. If not, keep up with your college on Facebook.

*Lewis Brown ’84 Ph.D.  
Dean of Engineering*

## 2016 DEAN'S ADVISORY COUNCIL

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- **Kathryn Walker** '81, retired chief network officer, Sprint Corp.

## ABOUT THE COVER

Graduate student Luis Duque flies a drone that photographs the Keystone Wye bridges within the Black Hills National Forest Feb. 16. The work is part of a study by Junwon Seo, an assistant professor in the Department of Civil and Environmental Engineering, to test the effectiveness of using drones for bridge inspections.

See story Page 29.

## IMPULSE

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# Impulse

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Ahim Bisibwe stands with his wife, two children and Dean Lew Brown at the December 2016 graduation ceremony. The Uganda native graduated with a bachelor's degree in civil engineering.

# Enrollment

grows by nearly 10 percent

**“An American education can be very expensive for an international student. I sit at college fairs overseas and I see and hear schools charging international students \$60,000 a year. They’re looking for a quality education, primarily in a safe environment ... and at a reasonable price.”**

Richard Reid, associate dean

**A**him Bisibwe, a Uganda native, graduated in December 2016 with a bachelor’s degree from the Jerome J. Lohr College of Engineering. The degree wasn’t his first.

Bisibwe received a bachelor’s degree in agricultural engineering in Uganda, where he worked with water and irrigation systems. When his wife was pursuing a medical degree in the United States, Bisibwe decided to go to school for a second time.

“Coming from my country was a bit tough. The requirements are high, and you have to prove that you will stay here; money and property were a bit high,” Bisibwe said.

This time, Bisibwe earned a civil engineering degree. He obtained the second degree so he could work in both America and Uganda. With a goal to have an enrollment of 20 percent international students within the next five years, the college is looking for more students like Bisibwe.

Bisibwe was part of an upswing not just in international students, but also overall enrollment growth for the college. In fall 2016, it saw nearly a 10 percent increase in enrollment, the largest increase of South Dakota State University’s six colleges in the past year.

“We are certainly making our contribution in maintaining enrollment growth at South Dakota State,” said Associate Dean Richard Reid.

The 2016 hike is the largest percentile growth of any college in the last five years. Reid said that the growth can be attributed to the high demand for engineers. According to the South Dakota Department of Labor, engineering-related

career fields are not only in high demand, but also considered high-paying careers. For example, civil, mechanical and industrial engineering fields in South Dakota are expected to grow by an average of more than 12 percent in the next eight years, each with an average salary of over \$73,000.

To help respond to the demand, the college has two other enrollment goals: a 3 percent annual increase in undergraduate students; and a 20 percent female enrollment.

“To maintain the funding we need to run the college, we need enrollment. You recruit on a number of fronts so when one goes down, the other goes up,” Reid said. “We have departments where we could use enrollment growth and we have departments that are also over capacity.”

The college’s undergraduate enrollment sits at 1,635 students, 16 percent international students and more than 13 percent female.

According to the American Society for Engineering Education, the national average for international undergraduate engineering student enrollment is nearly 10 percent. Reid said the college’s above-average international student enrollment can be attributed to extensive recruiting efforts. He has been to Sri Lanka, Saudi Arabia, Nepal, Bangladesh, Singapore, Thailand, Vietnam, Malaysia and other nations in pursuit of students. In addition, SDSU’s Office of International Affairs makes at least three recruiting trips each year for the university, not counting stops at community colleges on the West Coast.

“Most international students start at a community college, looking for a four-

year school to transfer to,” he said. “We go to those venues to get those students to consider South Dakota State.”

Reid said that it is important for international students to attend universities in the United States. He thinks that it forms beneficial relationships for students.

“I don’t care if you work in Aberdeen, South Dakota, or New York City; our graduates are going to work in an international environment,” he said. “Chances are they are going to have to interact with people of other races, cultures, backgrounds, what have you ... if they can’t do a study abroad, let me bring those chances to you. You learn different things about each other and that is a part of your education.”

The top five countries for State’s international engineering students are Saudi Arabia, India, Nepal, Bangladesh and Korea. Low overall costs are a selling point, according to Reid.

“An American education can be very expensive for an international student. I sit at college fairs overseas, and I see and hear schools charging international students \$60,000 a year. They’re looking for a quality education, primarily in a safe environment ... and at a reasonable price,” he said.

That was the case for Bisibwe. He said many international students do not consider coming to the U.S. because tuition can be expensive.

“Studying in America is very costly, but I feel that African students can afford to come to America if they go to SDSU,” Bisibwe said.



Vanessa Konyonenbelt is a freshman electrical engineering student. The Briggs Scholar is following in her family's footsteps by becoming an engineer. Her older sister, Kevy, is also an electrical engineering student at South Dakota State.

He said he had a good experience at SDSU, receiving better resources and education than he would have in Uganda.

Tau Beta Pi member Iasmin Rosa, a senior civil engineering student from Vila Velha, Espirito Santo, Brazil, said she came to SDSU because it seemed to be the best school academically that gave her an offer to play intercollegiate tennis. She said that this combination is uncommon in Brazil.

"There were a lot of Brazilians here when I got here," she said. "It was good to

have someone to talk to and to get information about how things go."

Being a female and an international engineering student, as well as a student-athlete, has its challenges.

"Because I am an international student, there can be a language barrier. Like yesterday, I was doing homework, and I was like 'what does this mean?' I have to look up some terms a lot, especially in engineering. We have several terms that I had no clue about," she said. "Engineering is not easy. We are constantly studying. We



**“I think it’s always really encouraging when you see women who are faculty, upperclass students or people who are helping out ... who have been through the program. Then you know that it’s possible and doable. They don’t just recruit you to get into the door.”**

Vanessa Konynenbelt

college has seen in recent history. However, it is posting numbers lower than the national average, 21.4, for undergraduate students. State is sitting at 13.2 percent.

Civil and mechanical engineering, along with mathematics, are the top majors posting the higher female enrollment numbers. Rosa, who falls into this category, said that the involvement of female engineering students is high.

Alpha Omega Epsilon and the Society of Women Engineers are two such groups. These groups help reach out to female students in middle and high schools to help gain interest in STEM-related fields.

have a lot of homework and me being gone all the time means I’m doing homework on the road. The amount of things we have to learn with the language difference sometimes is the worst part.”

Rosa said she feels things are looking up in terms of the college’s female enrollment.

“If you look at my classroom, we don’t have many female students, but I feel like it’s growing,” she said.

Of the college’s 300 female students, 216 of them are undergraduate students. This is the highest female enrollment the

GEMS, is one program offered for females in the spring. Forensic science, bridge building and robotics are among the areas covered through the camp. This camp specifically targets eighth-grade girls. Reid said this is done because females tend to lose interest in math and algebra around this age. Konynenbelt said that programs such as these continued her interest in engineering.

“I like the opportunity that it provided. You know there’s a lot that you can do with engineering, electrical especially, it’s very, very, versatile,” she said.

When deciding where to go to college, Konynenbelt said SDSU’s faculty members were very encouraging.

“I think it’s always really encouraging when you see women who are faculty, upperclass students or people who are helping out ... who have been through the program. Then you know that it’s possible and doable,” she said. “They don’t just recruit you to get into the door.”

Despite the college’s efforts to recruit female students, Rosa said that SDSU is not the issue when it comes to female enrollment.

“I feel like society already has something set that girls don’t go into engineering. I don’t think the school has that power to change peoples’ minds, but they are trying ... I feel like it’s society that needs to change.”

Heidi Kronaizl



# Malaysian student

## follows his father's footsteps 35 years later

**M**alaysian native Eric Ng was drawn from his home country to SDSU 31 years ago by two factors: its cost and its location.

"I saw South Dakota, so it must not be so cold. I was wrong on that," said Ng (pronounced Erng) during an Oct. 24, 2016, interview at a Brookings café. Ng was in Brookings for only the third time since his 1991 graduation from the mechanical engineering program. He was here to check on another mechanical engineering student.

Ng's oldest son, Jin Hang Ng, is a first-year freshman and is mirroring some of his dad's impressions of SDSU—cold weather, friendly people, good school.

Jin Hang Ng said in making his college decision, "I wasn't sure whether I wanted to major in computer science or mechanical

engineering. For computer science, I thought of schools such as Carnegie Mellon and UC Berkeley. Once I decided to try mechanical engineering, I didn't really look at other schools because the best mechanical engineer I know studied at SDSU."

He was, of course, referencing his father, who is a successful manufacturing entrepreneur in Malaysia, where he owns four plants and employs 250 people.

Epsilon Technologies was established in 1996 and is one of the leading engineering companies in the northern region of Malaysia. It specializes in designing, fabricating and manufacturing precision machinery components, jigs and fixtures, and automation equipment for automotive, medical and pharmaceutical industries.

Eric Ng spent the first five years of his career as an equipment engineer for assembly line and testing with Sony, then the No. 1 producer of floppy disks.

### **Worked his way thru college**

When Eric Ng came to Brookings in 1986 at age 22, he was the first in his family to come to the United States and this was his first trip to America. "I started in January. I landed at the Brookings Airport. The first thing I do is grab a bunch of snow," he recalled. Ng had grown up in a small village in Malaysia, which is a peninsula in the South China Sea.

The economy centered on charcoal manufacturing. Ng grew up "fixing things," so an engineering career seemed natural.

His parents were supportive of his interest in getting trained in the United



Once I decided to try mechanical engineering, I didn't really look at other schools because the best mechanical engineer I know studied at SDSU."

—Jin Hang Ng referencing his father

States, but doing so required him to get a loan and a job in Brookings. His entry to the American workforce began at Larson Commons, where he washed dishes all through college. Ng said he washed dishes in the evenings, did homework until 1 or 2 a.m. and then was up at 7 a.m. for classes.

The job and a couple other short-time positions enabled him to buy a car, a \$200 fixer upper, within a few months of arriving in South Dakota.

Later he bought a \$1,000 Monte Carlo when his friend took advantage of a "buy one, get one free" offer. He also learned to drive in the snow, to parallel park and to spin circles in empty parking lots. He bought tools so he could repair and resell vehicles. Recreation included playing volleyball and socializing with a beer at Jim's Tap downtown.

Ng lived in Hansen Hall, then considered the cowboy dorm, but he said he had a lot of friends, including one who was a biker.

### Memorable senior design project

In the classroom, he remembers Chuck Raymond, now in private business in Brookings, and Kurt Bassett, who was then in his third year on the SDSU faculty and now is mechanical engineering department head. Pete Leiferman, now a Brookings farmer, was the shop teacher.

"SDSU was perfect for me. I liked the staff. It was a very safe environment. You didn't even need to lock your car. My birthday is your Independence Day."

His senior design project, completed in only a semester with two lab partners, entailed building a hoist to lift a wheelchair onto a boat. The project, which was entered into the 1991 Engineering Expo, was done for Steven Zinter, then a circuit judge and since 2002 a South Dakota Supreme Court justice.

The project left a big impression on both the elder and younger Ng.

Jin Hang Ng said, "I could tell my dad is proud to have studied at SDSU as he sometimes spoke of being a U.S.-trained engineer. He has a photo of his senior design project, his teammates and him pinned to a huge world map on the wall. It's the only picture he has on the map. The project was a machine that helped people with physical impairments board a boat. I think he also included a footnote that said -40 F"

### 'Friendliest people on planet'

Surprisingly, Eric Ng wasn't Jin Hang's only contact with an SDSU graduate. The chiropractor in his hometown also studied at SDSU and called State "the best university in the world," Jin Hang said.

So far his SDSU experience has been equally favorable.

While he has been surprised by the volume of work, Jin Hang said during his first semester he also has been introduced "to the friendliest people on the planet. The people here are extremely helpful and friendly. Associate Dean Dr. (Rich) Reid and his family were incredibly kind to share American culture with a friend and me while providing much assistance throughout the semester.

"Also, the Formula SAE guys (members of a race car-building team) are great at providing weather forecasts! And SDSU ice cream is awesome."

Jin Hang has had some struggles: keeping pace with the school work and not overeating at Larson Commons. Homesickness? "Only one time. Two, three, four, five, six, seven, eight, nine ... I do miss the people, weather and culture back home. However, I am extremely grateful to have people who make me feel right at home here at SDSU."

### Alums working to create scholarship

Having a few more Malaysian students from Malaysia would be comforting. Each



year about 10 students from Malaysia enroll at State, Reid said.

The associate dean does a lot of international recruiting for the college. In September 2016 he made his first trip to Malaysia and found students to be receptive. There are 28 alums from the departments of civil, mechanical and electrical engineering that call Malaysia home. Eric Ng is spearheading an effort to create a scholarship.

Jin Hang said, "I think many Malaysian students long for an overseas education. The only thing stopping them is the exchange rate. Scholarships would help tremendously."

Dave Graves

LEFT: Jin Hang Ng, a freshman mechanical engineering student, left, poses with his father, Eric Ng, a 1991 mechanical engineering graduate, before the Hobo Day football game Oct. 22, 2016.

ABOVE: Circuit Court Judge Steven Zinter is lifted by a hoist designed by SDSU engineering students Kevin Tullis, Jeff Clark and Eric Ng for their senior design project in 1991. Pictured with employees of Brad Clark Electric of Pierre are Tullis, second from left, and Clark, center. Ng was the photographer. The hoist at the public boat ramp in Pierre allowed the handicapped to be lifted into a boat. Ng was a Malaysian student wrapping up his mechanical engineering degree. Now he is a successful businessman in Malaysia and his son, Jin-Hang Ng, is a mechanical engineering student.



## People make the difference

An unplanned stop creates a treasured decision

Theatrical productions were in Doner Auditorium and students registered for classes in The Barn using course cards. Basketball games were there, too, and if you wanted to watch women's sports, you went to a gymnastics match.

That was SDSU 1971. Clearly much has changed in the near-half-century since Rod Scheel, moved down from West Fargo, North Dakota, to pursue a master's degree in power engineering. Obviously, the faces have changed as well but the character of the people remains distinguished, according to Scheel and a pair of current engineering students recruited to State.

Kevy, a sophomore, and Vanessa Konynenbelt, a freshman, are both from Fergus Falls, Minnesota, where Scheel now lives as well.

He retired in August 2015 after a 42-year career with Otter Tail Power Company, headquartered in Fergus Falls. For the last 20 years of his career, he was a vice president; vice president of asset management and the last 2 ½ years vice

president of information technology and special projects.

The two years he spent at SDSU were not forgotten, and he served many years as an electrical engineering adviser for the Center for Power Systems Studies board.

The North Dakota State University undergraduate remembers being won to SDSU by the personal interest shown to him when he scouted the school.

The sincerity and caring spirit found in faculty member Wayne Knabach and Dean Junis Storry in 1971 are now alive in Department Head Steve Hietpas, Associate Dean Rich Reid and others, the Konynenbelt sisters discovered. That doesn't surprise Scheel, who practically insisted they visit SDSU when they were college shopping in 2014.

### Visited 'on a whim'

Scheel had their attention because the Konynenbelts' mother, Heidi, was a manager at Otter Tail Power Company and worked under Scheel.

"I said to Heidi as she was driving south on I-29 to Rapid City, 'Heidi, why in the world do you want to drive all the way out to Rapid for a campus visit when you can go to the finest engineering institute in all the world just three hours from Fergus Falls,'" Scheel recalls from that October phone call. Heidi said, "on a whim, we stopped in" during what turned out to be a Minnesota visitation Friday.

Kevy said the family—herself, Vanessa, Heidi and younger brother Eric—were immediately greeted in the University Student Union parking lot.

"Are you from Minnesota?" an admissions ambassador asked the Konynenbelts. Kevy thought, "Oh my gosh. How did you know?"

That was the beginning of what could be called a whirlwind romance. Kevy explained, "we were just going to drive around but Mom said we needed to talk to some students and rolled the window down. 'Oh, don't do that,' I said." But you know how moms can be. The next thing the Konynenbelts knew they had a parking

permit and were checking in at the union.

The Konyonenbelts were then asked their academic interest and were soon being escorted to Crothers Engineering Hall.

### Audience with assistant dean

Soon they were in a conference room meeting with Reid and another family.

“That meeting was the most pivotal, not only for Kevy, but for me as a parent,” Heidi said. “Kevy was given some invaluable advice about what to look for in a university, how to apply for scholarships and what to consider when determining a major. Kevy didn’t want to leave and couldn’t wait to go back. It just clicked for her and, interestingly, she is now an (admissions) ambassador for SDSU.”

Recalling that visit, Kevy said she was overwhelmed by the people.

“Students were all friendly and happy. There was the friendliness of the admissions ambassadors and the feel of the campus. Buildings looked new and lovely. There was this kind of energy on campus. I realized after going to an all-tech school the next day that I was looking for the broad university experience,” she said.

Since then she has gotten heavily involved in campus activities. In addition to being an admissions ambassador, Kevy participates in the Society of Women Engineers and the SDSU chapter of the Institute of Electrical and Electronics Engineers and traveled to Bolivia with Engineers Without Borders.

### ‘Against own will, falling in love with SDSU’

Vanessa, also an electrical engineering major, said, “I don’t think I had such a romantic impression (of SDSU). I don’t think I was so swept off my feet.”

While she was impressed by the friendliness of the people and the interest that Reid showed in her academic future in that October 2014 visit, she didn’t leave Brookings thinking she had found her new college home. That changed over time.

During the fall of Vanessa’s senior year, her thinking was “I’m not going to

go here. Kevy went here. I’m going to be my independent person. I was excited about going to a city or far away. But I kept visiting here”—during Minnesota visit day, on scholarship weekend and another personal visit of her own.

She reluctantly had to admit, “shucks, this is a very nice place.” Then there were those handwritten thanks-for-visiting cards from the admissions ambassadors. “I wasn’t getting that kind of personal attention elsewhere.

“I decided I wanted that and the launching pad that SDSU would give me. Against my own will, I was falling in love with SDSU. And now I’m glad Kevy is here.”

### Another Konyonenbelt to come?

Early in her freshman year, Vanessa thought her heart might have led her astray. “At the beginning, I thought this is kind of small and flat. But I’m really enjoying classes and friends. I’m very grateful and happy to be here. I like that my classes are small. They’re not just classmates any more. They’re friends.

“Living in Honors Hall has been really, really great. All of my friends on my floor know each other. It’s very connected. It feels like a home away from home. I would consider Brookings my home more than Fergus Falls.”

They hope that younger brother Eric also will attend State and make it feel even more like home.

When Scheel was trying to recruit the Konyonenbelts to his alma mater, he told Heidi, “You went to Montana State, but the students from those small communities in South Dakota, northeast Nebraska and southwest Minnesota are great people to be around.” The sisters were dubious of his claim, but in retrospect it is just those assets that Scheel talked about that convinced them to attend.

“We’re very thankful for him introducing us to this place,” Kevy said.

*Dave Graves*

Fergus Falls, Minnesota, engineering students, from left, Tyler Jorgenson and sisters Vanessa and Kevy Konyonenbelt gather outside Crothers Engineering Hall on a chilly day before the start of spring break. Alum Rod Scheel played a role in attracting all three to SDSU.

## The Fergus Falls connection

Fergus Falls lies in east-central Minnesota, closer to Fargo than Brookings, but the Jackrabbit influence there is growing thanks to a very satisfied customer.

Rod Scheel, ’73 MS power engineering, is doing all he can to add Yellow and Blue to the sea of Green and Gold. His caring, individualized approach is bearing fruit. Currently, six students from Fergus Falls attend SDSU. Scheel doesn’t take credit for each one, but he certainly played a role in the college selections made by the Konyonenbelt sisters (see accompanying story) and Tyler Jorgenson, a freshman electrical engineering student.

He tells his story below:

“Rod Scheel lived just down the road on the other side of the gate between our streets, and I remember almost daily seeing him on his daily walk and the friendly talks with him.

“It was the end of freshmen year of high school when I started thinking seriously about my major and possible colleges. Most of my relatives and classmates went to NDSU and UND, so I had those schools on my radar and I had more questions regarding how to further myself in preparing for an electrical engineering degree. I knew that Rod worked at Otter Tail Power Company in a related field, so I called him at work and we ended up meeting a couple of days later at Perkins for supper, his treat, to talk and see if he could answer any of my questions.

“It was a positive experience but mostly, it was the first time I considered coming to SDSU. His passion for this school was palpable and he suggested that both NDSU and SDSU, of which he is an alumnus, were good schools, but to check out SDSU—if nothing else for its ice cream at the Dairy Bar.

“One of his suggestions that night was to check out SDSU’s engineering summer camps, and that following summer (2014) I signed up for the YEA (Youth Engineering Adventure) camp and had an amazing time the week I was here. After visiting SDSU on a Jackrabbit Preview day during my junior year, I knew this was the college that I wanted to receive my degree from, so I applied and was accepted into the engineering program.

“I’ve been close with Rod ever since that supper, keeping him up to date with my adventures, and he has been supportive every step. Also, this last fall semester Rod had been in contact regarding a Fergus Falls ice cream social at the Dairy Bar, again his treat, which he wanted to host to catch up with all of us and meet some of the new Fergus students who were attending.

Rod is an amazing guy who will go great lengths to help others in any way possible, and is one of the main contributing factors in why I attended South Dakota State University.”



# Engineering degree

## pays off for Sioux Falls Fire Rescue

Despite first viewing scenes of the Copper Lounge building collapse on social media while at home that December day, Mike Murphy's mind kicked into action. A captain for the Sioux Falls Fire Rescue, Murphy was off when he heard about the collapse. However, he knew he would soon be called in.

"I had to stand back and take it all in. You can't imagine it happening in your town, but that's when your skills kick in," he said.

Murphy, a State biology and civil engineering graduate, is a structural specialist for the fire department. When arriving on-site, he evaluated the incident and advised the rescue branch on how to stabilize and move different parts of the broken structure in an attempt to rescue two people and three dogs.

He said response efforts were like three separate instances in one. With a combined effort made by first responders, city of Sioux Falls engineers and Henry Carlson Company, two excavators, a crane, teleboom and a large vacuum truck were used to help clear the dust and debris that had fallen on top of those lying under the rubble. Responders first gained access to Emily Fodness, a woman who was in an apartment on the upper level of the building at the time of the collapse.

Murphy said in order to gain access to the second patient, he had to do some timber shoring, which creates a structure that temporarily props and supports buildings to keep them from collapsing further. He said he learned how to do this in CEE 458 Design of Timber Structures, which he took from Nadim Wehbe

Wehbe, who is now the department head for civil and environmental engineering, said that the timber design class is a senior elective course. However, it hasn't always been taught at SDSU. Wehbe

decided to re-introduce the course and teach it when he came to SDSU 19 years ago.

"I thought that this course was important considering most of the structures in the United States are timber structures," Wehbe said. "Shoring in principle is very similar to the design of columns."

Wehbe said that temporary timber shoring is not taught as a separate topic in the timber design course, but can be classified as a subset topic of columns and compression elements.


Murphy said timber shoring was completed to ensure the Copper Lounge building did not further collapse on the first responders when attempting to make the rescue. They had to "de-layer," or remove the second and third floors, of the building in order to gain access. The second patient, Ethan McMahon, died due to the collapse.

"In a perfect world, we would have been able to rescue both of those patients," Murphy said.

Three dogs that lived in the upper level of the building were rescued. The first dog was found with Fodness. The other two were detected thanks to Cisco, a live-search dog with the Rapid City Fire Department that responds to urban rescues within the state.

After a working a 15-hour day, Murphy went home. He said that it took him weeks to recover because the incident was so mentally and physically draining.

"I had not responded to anything of this magnitude. I have been to smaller incidents, such as buildings with tornado damage or a car running into them," he said. "SDSU played a huge role. My education was priceless for what I had to do that day."



"My education was priceless for what I had to do that day."

Mike Murphy, captain  
for the Sioux Falls  
Fire Rescue

Murphy joined the fire department during his second year of engineering classes. He originally wanted to become a high school science teacher, but decided to make the switch to engineering during his junior year. The Sioux Falls native grew up near Station No. 5, where he now works.

"I remember when I was young, always seeing the fire trucks drive by and I took interest in that," he said.

After seeing a job listing at the station, Murphy applied. During his interview, he said that he emphasized that finishing his education was very important. To his surprise, he was offered the position. For the next two years, Murphy commuted from Sioux Falls to Brookings to finish his degrees. He graduated with his bachelor's degree in civil engineering in 2008 and his



bachelor's degree in biology in 2009. He said he was happy to “see it come full circle” and finish his education. Wehbe enjoyed having Murphy as a student.

“You know, in our business, the best gratification is to see students apply the knowledge they gained while they were here in school. That’s the best feeling you can ever have,” Wehbe said. “It’s always good to hear from [former students] and know that they have achieved a certain level in their careers.”

Now as captain for the department, Murphy works three 24-hour shifts a week. He inspects the trucks and equipment, and continues firefighting, medical and urban rescue training when not responding to emergency calls.

“You hope you get a little bit of sleep and get to go home at 8 a.m.,” he said.

Because he has a civil engineering degree, he can take supplemental training for rescue instances such as the Copper Lounge incident. He’s glad he chose firefighting as a career because he finds helping people every day fulfilling.

“In all reality, when people aren’t sure who to call, they call the fire department; and we are happy to help them.”

Mike Murphy, a South Dakota State University civil engineering graduate, responded to the Copper Lounge collapse in Sioux Falls on Dec. 2, 2016. He said the techniques he learned from professor Nadim Wehbe helped him gain access to patients underneath the rubble. Photo by Rich Murphy

INSET PHOTO: The collapsed Copper Lounge building. Photo by Reistroffer Design.

*Heidi Kronaizl*

A photograph of a construction site. In the foreground, a man in a red hard hat, safety glasses, a grey sweater, a high-visibility yellow vest, and brown pants stands with his hands in his pockets. Behind him, another worker in a white hard hat and safety vest is kneeling, and a third worker in a white hard hat and safety vest is standing near a doorway. The building is under construction, with white Tyvek wrap on the walls. A tall brick tower with a dome is visible in the background under a blue sky with light clouds.

# Tyler Hill

helps Journey  
build a better  
State

When working on an \$8 million project such as South Dakota State University's Alumni Center, Tyler Hill '11 admits it is a challenge.

Hill, who received a bachelor's degree in construction management, is the project's superintendent. He started with Journey Group shortly after graduation. Journey Group, which employs more than 25 State grads, has been providing professional construction services for 106 years and has constructed many complex and challenging projects. In addition to the Alumni Center, Journey Group also built the Architecture, Mathematics and Engineering Building.

"I never imagined I would be back at SDSU helping improve the campus this quickly. Due to gaining knowledge and experience in the construction industry after graduation, Journey Group gave me this great opportunity," Hill said, adding he also worked four months as a project engineer at the AME.

"My family and friends know that this opportunity means a lot to me and respect how I have grown in my career," Hill continued. "They also realize that involvement in a project like the Alumni Center takes a lot of time and commitment."

One of the first challenges was fall 2016's wet weather. Journey Group had to demolish the site's previously existing buildings, prepare the site for new construction and get the building to a phase where interior work could be done during winter.

"We had guys here until 7:30 the night before the first snowstorm came through," Hill said. "They installed about three-fourths of the glass on the main storefront of the event space to get us weathertight before the storm hit. That was definitely a challenge."

There is also the responsibility of working through issues that arise throughout the course of the project.

"It's a challenge to ensure every subcontractor is on the same page as the building progresses," he said. "Coordination not only helps the efficiency of the project but also assists in achieving the highest quality of work.

"One of my stronger characteristics as a leader is communication, another is planning," Hill continued. "Planning ahead is a key aspect of the project, but you also

need to designate enough time to take care of current situations that occur also."

Hill said the Alumni Center is on schedule for its June 2017 completion. While he knows a lot of things need to be completed before then, he likes this stage.

"It's interesting when you get to the finish stages of a project, like where we're nearing with the Alumni Center," he said. "While framing and building the structure of the building is important, one can start to feel the concept of the building better at this point in the project. Working on the finishing touches is my favorite and most rewarding part of the process.

"It's always been that way for me, even when growing up," Hill continued. "Seeing an outcome from something I have spent a substantial time creating is always very rewarding."

According to Jesse Davey '08, a project manager with Journey, Hill likes those challenges.

"When Tyler is managing the project you know it is being done right," said Davey, who also got a bachelor's degree from State in construction management. "Tyler also has high expectations when it comes to quality. He constantly monitors quality and demands quality from each trade on the project.

"Tyler's problem-solving skills are another big asset on a project. He is quick to identify issues, consult with the team and develop the best solution to move forward," Davey continued. "Finally, Tyler's most important quality is the way he interacts with owners. He has a way of communicating with owners that develops a trust, making the journey of construction a positive experience for any owner. Customers appreciate Tyler's honesty and openness. He is willing to do



anything for an owner to make their project successful and they know that."

One of the Alumni Center's future owners agrees.

"It has been great working with Tyler to create a new home to welcome thousands of alumni back to campus each year," Andi Fouberg, president and CEO of the SDSU Alumni Association, said. "We look forward to showcasing the past, present and future of SDSU in this new facility."

Hill looks forward to that day, too.

"To have worked on a building that people will be able to enjoy for many years to come, it is a great feeling," he said. "It's pretty satisfying to be able to give back to SDSU and do the best I can for this project. I think it'll help alumni become closer in the future. TSP, the architecture firm, did a really good job making sure this building has great views of campus and the Coughlin Campanile."

Hill said it's hard to believe he was taking classes in construction management less than 10 years ago and now he's helping create buildings on campus.

"In our classes, we'd create buildings and complete estimates, but nothing was specific to campus," he said. "Now, it's really interesting to see what's happened with the construction on campus and to be a part of it.

"Just being back here has been great," Hill continued. "It's been my favorite project, so far."

*Matt Schmidt*

At left, Tyler Hill takes a break to show off the Alumni Center's entrance.

Above: Hill, right, shows Jeevan Mueller and Denis Strizhius how he'd like them to complete their next assignment.



OPPOSITE PAGE & IMMEDIATE RIGHT: Students put their GPS skills to the test in an exercise on the east edge of campus. In summer 2016, the agricultural and biosystems engineering department purchased eight Kubota side-by-side utility terrain vehicles and equipped them with GPS systems for use in precision agriculture.

# PRECISION AG

State first university to offer bachelor's in precision ag

Precision agriculture has moved from a buzzword trying to prove its value to the mainstream of today's farming methods.

That means industry needs a labor force trained in the latest techniques. Hence, in July 2016 the South Dakota Board of Regents approved SDSU starting the nation's first bachelor's degree in precision agriculture. The state's 1862 land-grant institution had started a precision ag minor two years earlier. Response to that helped convince the administration to expand that to a major.

More than 90 students are pursuing a minor. The major has 19 students enrolled with 100 expected within three years.

That huge increase will be fueled by industry demand and the strength of the cooperating departments, said instructor Douglas Prairie.

"Precision ag has gotten a lot of publicity. It's gone beyond a niche to mainstream. Companies have made

significant advances in precision ag hardware and software and want to hire graduates who they don't have to train in those technologies," said Prairie, a 1997 ag engineering graduate who joined the faculty in fall 2016 after nearly 20 years of working in the industry.

"Our agronomy program is well-known throughout the country and our AST (ag systems technology) program is well respected. By taking two solid programs and making a hybrid, I see nothing but success coming out of it," Prairie said.

### Three departments, one major

The program is a cooperative effort of the agronomy, horticulture and plant science department, agricultural and biosystems engineering and mathematics and statistics.

New classes were created in all three departments to form the precision ag major, according to Van Kelly, head of agricultural and biosystems engineering.

Math's contribution is an upper-level class in geospatial data analysis. Agricultural and biosystems engineering added electrical diagnostics for farm machinery, climate risk management for precision ag, and principles and implications of chemical application systems.

Agronomy developed a class on the use of soil and plant science sensors in crop production.

Through internally reallocating staff, each department also gained a full-time faculty member to put SDSU in position to offer the nation's first precision ag major.

### A fleet of UTVs

The other adaption needed for the major was additional equipment. In summer 2016, the agricultural and biosystems engineering department purchased eight Kubota side-by-side utility terrain vehicles. "We worked closely with Raven Industries to get them outfitted with latest auto steer. We've worked with sprayer



FAR RIGHT: Ag systems technology majors, from left, Kendra Goblirsch, Dusty Gorder and Derek Tarabetz had the duty of outfitting the department's new precision ag equipment. In their role as student employees, they built three tool-bar frames for the two-row planters (one shown on far left) and installed the chemical injection system and Raven Hawkeye flow control system on the sprayer (far right). They also installed the auto steer systems on the eight Kubota utility terrain vehicles (two of which are in the background).



companies and have different types of equipment that can be connected to the UTVs.

“We can have a student understand the same monitoring control experience with only two rows instead of 16,” Kelley said.

While most of the attachments have been donated by industry, the frames and tool bars needed to pair them with the Kubotas were built during the summer and the current academic year by Jeff Vander Schaaf, precision ag machinery research coordinator, and a trio of students—Kendra Goblirsch, Dusty Gorder and Derek Tarabetz.

The program also will be boosted by having its own building. The Regents have given their blessing and fundraising is underway.

### The best it can be

Kelley notes that after SDSU announced the precision ag major, it made a splash in the trade press, including articles in Farm Journal, Progressive Farmer, PRECISION Ag, Ag Week and Ag Professional. But at some point, first will just be part of a trivia question.

Prairie said the precision ag major “has the potential for going beyond just being first, but being the premier program. When people think of precision ag, they want people to think of SDSU as the premier program. President (Barry) Dunn and the administration is committed to that with a multiyear plan for a new building and equipment.

Andy Socha, a junior from Corcoran, Minnesota, entered SDSU as an agronomy student with a precision ag minor, but now is majoring in both programs. “I believe agronomy and precision ag go hand-in-

hand. Understanding the tools and concepts taught in precision ag can help farmers become more efficient and grow higher yields,” he said.

Socha said he has also been impressed by the amount of hands-on work in labs and classes as well as the interest shown by companies in the major.

Jacob Van Santen, a freshman from Luverne, Minn., said, “When I decided to come to SDSU, I couldn’t make up my mind about my major. I wasn’t sure if I wanted to major in AST or agronomy. With the precision ag major, I am getting a mix of both of these two majors.

“One thing that has impressed me about the program is that it is basically taking two different majors and tying them together. I am in many different plant science courses and also many different AST courses. By being in the precision ag program, all of my classes, although different, are tied together.”

### A ticket to success?

In addition to being able to take technical learning back to the farm, students are finding plentiful and well-compensated jobs in ag service and manufacturing, Prairie said. Kelley adds, “Farm equipment dealers want to have a precision ag specialist on staff to instruct farmers on how to best use the company’s technology.”

Career options also exist in technical support at the regional level with manufacturers like John Deere, Case IH and AGCO.

Beyond that are research possibilities in precision ag just starting to be explored by the college’s faculty and students.

Individually, Aaron Franzen, an assistant professor in agricultural and biosystems engineering, is working to create a more sophisticated optical sensor for the study of plant growth and developing. He is also working with a couple math department faculty members to gain National Science Foundation funding on the large-scale analysis of data from equipment already in the field.

Long term, the biggest project is to gain startup funding for a Governor’s Research Center in cooperation with the School of Mines and several departments at SDSU.

“Statistically, when you compare the average national yield on university research plots with the average farm yield and multiply that by South Dakota cropland, we’re leaving \$1 billion in the field every year. The effort of the center would be to close that gap in a sustainable way as well as monitoring soil health and raising wheat protein levels.

“There is a lot of untapped genetic potential in our newest hybrids that are not getting used,” said Franzen, one of seven SDSU faculty members in the collaboration.

It involves representatives from agricultural and biosystems engineering, mathematics and statistics, computer science, electronics, plant science, horticulture and agronomy as well as biology and microbiology. Sharon Clay (plant science) and Qiquan Qiao (electrical engineering) lead the group, which has been meeting since December.

Proposals were due March 13 with the Board of Regents expected to announce the recipients in June.

*Dave Graves*

# NEW ASCE FELLOW



## Reid honored for 34 years of service to engineering profession

**R**ich Reid, who has spent 21 years serving civil engineering students and 34 years in the profession, was honored March 16 as a fellow in the American Society of Civil Engineers.

A fellow is one of the top honors in the organization, which is America's oldest national engineering society and represents more than 150,000 engineers worldwide. Only 3.5 percent of its members receive the prestigious title of fellow. Reid, along with others, was honored at a Washington, D.C., dinner.

Reid has been on the SDSU faculty since 1995 and for the 13 years prior to

that held engineering positions in the U.S. Air Force.

Currently the associate dean, Reid joined the faculty as an assistant professor teaching classes in geotechnical engineering as well as working with senior design projects. He progressed through the ranks (associate professor in 1999, full professor in 2004) while also teaching mechanics of materials and other transportation-related courses.

### Continuing to serve: National Guard

Although Reid left full-time military service when he came to SDSU, he became the civil engineering officer in the South

Dakota Air National Guard in 1996. He held that position through 2003.

It was in 2003 when his unit was deployed to Iraq. Reid served as base civil engineer at the Baghdad International Airport and later was assigned as the deputy base civil engineer at Tallil Air Base. He considers that time at Baghdad "my most significant, successful and challenging engineering and leadership challenge."

Reid commanded a squadron of 165 and was responsible for the design and construction of the Air Force base at the airport as well as being in charge of firefighting, explosive ordnance disposal and disaster preparedness soon after it was under the control of allied forces.

At Tallil, he was responsible for planning and construction on this captured Iraq air base.

Reid would continue his military duties through 2011. He was commander of the 114th Civil Engineering Squadron, a 105-member unit of the South Dakota Air National Guard, from 2003 to 2008. He became inspector general in 2008-09 and finished his service as a member of the State Joint Force Headquarters responsible for logistical operations.

"The opportunity to serve our country and work with our airmen has been both a source of pride and satisfaction for me. It is also significant that it started with my father's service as a pilot from WWII through Vietnam, and continues today through all three of our children."

### Serving academic colleagues

Except for the year he was deployed, Reid never took a break from his campus duties. He gradually took on more administrative duties, becoming an assistant dean in 2001 and interim head of civil engineering in 2006-08. He oversaw academic programs, accreditation and

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Associate Dean Rich Reid poses with Marsia Geldert-Murphey, a 1992 civil engineering graduate, after they both were recognized as a fellow of the American Society of Civil Engineers at the ASCE's March 16 gathering in Washington, D.C. Murphey now is director of Environmental, Geotechnical and Transportation Services at Gonzalez Companies, St. Louis. Only 3.5 percent of the group's 150,000-plus members attain fellow status.

everything student-related from recruiting to graduation. In 2010, his duties became administrative as associate dean for academics and engineering extension.

The academic function puts him over six departments and 1,600 undergraduate students. The extension function has Reid in charge of 12 people in engineering outreach programs that have a \$1 million budget.

Zachary Gutzmer, an instructor and lab manager in the civil and environmental engineering department since 2008, said, “Rich is one of the most respected and influential figures at SDSU. He blends professionalism, personality and experience in his leadership technique perfectly. Rich has a lasting positive impact on all engineering students before, during and after their time at SDSU.”

### Connecting with students

Reid said that throughout his career he has gained a lot of satisfaction in mentoring and developing his colleagues, but a greater joy yet is witnessing the gains made by students.

In addition to teaching, Reid has been an adviser of the SDSU chapter of the American Society of Civil Engineers since 2005 and was lead adviser from 2005 to 2010.

“Every year I served as the lead adviser, the chapter received either the Region 7 Governor’s Award or the Distinguished Chapter Award. The chapter was also recognized as a Robert Ridgeway (national) Finalist two times, and I received the Faculty Adviser Certificate of Commendation three times and Region 7 Adviser of the Year in 2010,” he said.

Justin Bucher, a 2014 graduate and president of the Eastern Section of the South Dakota ASCE chapter, said, “he’s been a great resource for students. He’s an all-around great leader.”

Now, one of Reid’s primary responsibilities is student recruitment and he has done a good job with it.

### Changing the face of the college

The Jerome J. Lohr College of Engineering has the strongest new student enrollment in the university in the last several years. While part of that can be credited to market demand, the college has greatly expanded its recruitment efforts.

Since 2002, undergraduate enrollment has grown by 50 percent and graduate enrollment by almost 250 percent. In fall 2016, those respective numbers were 1,646 and 323.

The college also has achieved goals in becoming diverse. The number of undergraduate international students has more than doubled in two years—from 127 in 2014 to 264 in 2016. Part of that can be attributed to college fairs that Reid has attended in Singapore, Malaysia, Vietnam, Thailand, Nepal, Sri Lanka, Saudi Arabia and Pakistan in the past three years.

On the homefront, Reid has overseen programs to increase the number of female engineering students. Females represent about 13 percent of the undergraduate student body, double what it was when he arrived, Reid said.

“Workshops like GEMS (Girls in Engineering, Math and Science for eighth-graders) and Ready, SET (Science, Engineering, Technology), Go! (for high schoolers) give youngsters a chance to see college and professional women who have found engineering an ideal fit for their interests in math and science. The cumulative effect of those workshops is amazing,” Reid said.

The personable Citadel and Georgia Tech alum also is involved in scholarship selection, New Student Orientation and student organization oversight.

“I enjoy anything that gets me in the same room with past, present or future students,” Reid said.

That includes the family dinner table. Lindsey, the oldest daughter of Rich and Kathy ’77 Reid, is a 2011 mathematics graduate. Becky, their youngest child, will graduate in December from the College of Nursing. Middle child Tim is a graduate of the U.S. Air Force Academy and Sanford School of Medicine.

“To be considered as a fellow in ASCE is humbling. Completing the paperwork caused me to reflect on all my experiences. I’m truly grateful,” he said.

*Dave Graves*

## SDSU & ASCE fellows

Rich Reid and Nadim Wehbe, current head of the Department of Civil and Environmental Engineering, are both fellows in ASCE. Wehbe received his honor in October 2015.

Former faculty members who are ASCE fellows are Bruce Berdanier, Nadim Hassoun and Ali Selim. Fred Rittershaus of Brookings, a 1958 and 1962 SDSU grad and a retired chief executive officer at Banner Associates, also is a fellow.

Marissa Geldert-Murphey, a 1992 grad who is director of Environmental, Geotechnical and Transportation Services at Gonzalez Companies, St. Louis, was inducted with Reid March 16.

### Reid’s other honors\*

- Outstanding First Year Student Advocate Award – National Resource Center for First-Year Experience & Students in Transition (2009).
- College of Engineering Teacher of the Year (2007-2008)
- Brookings County Military Officer of the Year (2007)
- College of Engineering Academic Advisor of the Year (2003-2004)
- SDSU Educator of the Year, Brookings Chamber of Commerce (2001)
- College of Engineering Teacher of the Year (2000-2001)
- College of Engineering Teacher of the Year (1997-1998)

\* A selected list.

# ENTREPRENEURIAL SPIRIT



## Robbie Veurink

starts not one, but two, businesses

Attention to detail has always been part of Robbie Veurink '09/M.S. '11. Whether it is properly placing tools in the back of a pickup or spending approximately 500 hours going over a punch list at the Denny Sanford PREMIER Center, he has made sure it was done right.

Loading the pickup just right was part of the daily routine when he and his older brother, Erik Veurink '08, started Veurink Construction when Robbie was in eighth grade.

"We had a 1988 Dodge Prospector with no air conditioning and the tools fit in the back of the truck just the right way where the ladders had to go in first," Veurink said. "If you needed a ladder at the end of the day, you couldn't put in any of the tools in the truck. You literally had to stack everything together a certain way. Looking back, it wasn't fun at the time but it was cool how it all worked out."

That attention to detail and process played a role in his job as an engineer with the city of Sioux Falls where one of his projects was the PREMIER Center.

"I had a lot of fun on the PREMIER Center and developed a lot of unique skills," Veurink said. "It certainly had a level of stress as I was tasked to overseeing large amounts of work and I was relied upon to make a lot of decisions. Over the course of three years, I made a lot of friends, and it is a project I will not forget. My role was to act on behalf of the city as an owner and oversee different scopes of work. My scopes ranged from special systems such as the IT systems to the steel truss system and everything in between."

Veurink worked with management groups, city leaders, architects and engineers, and the construction team to determine the best route to complete the PREMIER Center on time. He talked about running wiring for broadcasts and how amenities such as the ribbon board and additional scoreboards impacted the schedule.

"We had a great team. I was just a small part but it's fun to come back and look at this building," he said. "I look at things I had a part in and see how they turned out, see how they're wearing or what we could have done differently; look for opportunities for improvement."

"I spent nearly three years of my life here. I remember the bad," Veurink said, breaking

into a laugh, but noted he has good memories from the project. “One of my most unfavorable tasks was punch-listing. I estimate I spent between 400 to 600 hours punch-listing in this building. It became a chore to do and there were tens of thousands of items.

“I kind of developed a trademark that people who see me today still make fun of me for—blue tape. Yes, painter’s tape. That’s how we marked items that needed to be fixed or replaced. I worked closely with the architects and spent a lot of time doing that. I was pretty particular and that’s why the city loved having me do it. Anyone who knows me with this project knows I put a lot of blue tape on this building.”

But construction projects are more than just rolls of blue tape for Veurink. His love for building fueled the desire to start two companies, Midwest Engineering and DownRange Construction.

“I wanted to help customers in a different way and be a resource to those around me. I co-founded Midwest Engineering with Brent Krohn ’09 as a

startup company, and we hit the ground running hard,” Veurink said. “We have been growing every year and continue to expand and grow on our ideas.

“I recently founded DownRange Construction to offer construction services for structural projects. It goes back to my roots in construction,” he continued. “I found it was beneficial to provide structural services to complex projects, as my experience and knowledge were valuable in the construction field. We plan to continue to grow and expand in the years to come.”

The love of being on the job, dealing with challenges and working with construction tools are part of the reason Veurink has such a strong focus on work.

“My favorite projects are the ones that people have looked at and said can’t be done. Those are the projects I want to do. I really enjoy working with people and delivering a good product for them,” he said. “If you ask anyone who knows me, they’ll say it’s hard to get me to take a day off. I love what I do. It’s easy to work nonstop when you enjoy what you do. I

think it’s the atmosphere of doing things and being on the jobsite. I do have to help from time to time ... I’ll still shovel concrete.

“I wouldn’t be where I am today without my construction experience and my education,” Veurink said. “My bachelor’s and master’s degrees in civil engineering are an essential part of who I am today and complements my construction experience and vice versa. Efficiency and effectiveness are achieved when you combine both. My success is contributed to my great education at SDSU and my years of working hard in the construction industry.”

While the trucks have changed over the years for Veurink, his career still has him driving around looking for projects to build or make right.

*Matt Schmidt*

Veurink, when working with the city of Sioux Falls, spent nearly 500 hours going over a punch list at the Denny Sanford PREMIER Center. He has since started Midwest Engineering and DownRange Construction.



## FIND HELP ON THE WEB

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CAREER FAIR  
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THEATER  
(State University Theatre/Prairie Repertory Theatre)  
[www.sdstate.edu/cst/sut/index.cfm](http://www.sdstate.edu/cst/sut/index.cfm)  
[www.prairierep.org](http://www.prairierep.org)



## MERRICK ERICKSON

idea pays off for junior

While walking around the South Dakota State University campus, Merrick Erickson had an idea.

“My freshman year, I noticed that there were a lot of people riding their longboards on campus, yet there wasn’t any place for people to buy longboards or parts for them,” Erickson said.

Nearly two years later, the idea came back to Erickson, this time in the form of a longboard with the SDSU logo on it.

“I thought it sounded like fun and was something I could swing,” he said.

Erickson, a junior mechanical engineering student from Watertown, began the project as part of an independent study class for his entrepreneurial studies minor in August 2016. He orders the parts and puts them together to sell at the University Bookstore and on its website. The longboards debuted in the campus bookstore this past November. Since riding season is usually in the spring and summer, Erickson hasn’t seen a large sales response. He is hopeful that changes when the days warm.

While Erickson was completing the business plan for his independent study, assistant professor Craig Silvernagel approached him about submitting his plan in the First Dakota National Bank New Venture Competition. Students who enter in the competition write an essay about their business plan and describe the market demand and the business requirements.

Erickson was one of seven finalists in the December competition, taking home a \$1,250 prize.

“It was really cool. It just made me think, ‘Wow, people actually think that this seems viable,’” he said.

He hopes to continue selling the longboards through the next year and after graduation. Erickson’s aspirations after completing his education include working in automotive engineering, an interest developed through his involvement with the Formula Society for Automotive Engineers Club at SDSU.

Erickson started working with the Formula SAE Club during his freshman year. The club spends one year designing and building a car to race. In the first semester, club members use software to design the racecar and obtain sponsorships to buy parts or have companies donate custom parts. The members then create whatever else is needed and assemble the car. Once complete, the club races the car in competitions.

Erickson is now the electrical lead for the club. He took on the position because that was the

engineering area he knew the least about. He enjoys putting his engineering skills to use firsthand.

“It’s just a great experience to work with a team on something that’s actually being made, like a real-life application.”

He feels that working on the Formula SAE car directly translates to his passion for automotive engineering. Erickson owns two Mazda Miatas and hopes to open his own shop someday exclusively for this brand and model of car to improve the systems within.

“They’re really fun cars and they’re reasonably cheap,”

Erickson said. “I just like learning how different things work.”

Whether it’s the wheels on a longboard or on a car, Erickson hopes to continue his passion for things that move after graduation.



Merrick Erickson receives an award from Barb Heller, entrepreneurship coordinator at SDSU, for his entry in the First Dakota National Bank New Venture Competition. His entry was longboards, assembled by Erickson, with the South Dakota State University logo on the bottom. They are for sale at the University Bookstore.

Heidi Kronaizl

## Students News

### Math major presents at state Capitol



Senior mathematics major Nick Stegmeier of Tea was one of three SDSU students to speak with South Dakota legislators at the annual Student Poster Session in Pierre March 2.

He talked about how he improved a fluid flow simulation program that engineers can use to design anything from pipes to jet engines. Using the program, engineers can predict, for instance, how changing the diameter of a nozzle might affect a component. “It is incredibly important for any technical design involving fluid flow,” he said.

Associate professor Jung-Han Kimn helped guide him through the process. “Each day I was stuck on something new,” Stegmeier said. “Instead of telling me the answer, he’d reframe the problem and typically then I could solve it.”

This summer he will work at Los Alamos National Laboratory near Santa Fe, New Mexico, and then will return to SDSU in the fall for graduate school.

### Physics chapter honored

The Society of Physics Students was named a distinguished chapter for its efforts in the 2015-16 academic year. South Dakota State was one of 77 distinguished chapters nationally and one of six in its zone.

The judging criteria include: Involvement in local, zone and national Society of Physics Students meetings and other professional meetings, participation in Society of Physics Students programs, outreach efforts to grades K-12 or the general public, participation in community service, contributions to student recruitment and retention, participation in social events and interactions with the department’s alumni.

### PES Scholarship recipients named

Electrical engineering seniors Andrew Hora and Evan Laursen were selected for a third consecutive year to receive a major national scholarship from a leading

provider of electric power and energy information in the United States.

Hora, of Viborg, and Laursen, of Aurelia, Iowa, received \$3,000 awards. Samantha McBrayer, a senior from Sioux Falls, received the award for a second year. Grant Metzger, a sophomore from Rock Rapids, Iowa, is a first-time recipient. McBrayer and Metzger each received \$2,000 awards.

The scholarships were awarded by the Power and Energy Society of the Institute of Electrical and Electronics Engineers.

In addition to the scholarship, recipients are expected to participate in a power-related summer internship.

Throughout the U.S. and Canada, 230 of the 529 applicants were awarded a total of \$519,000 for the current school year. The selections come from 110 universities. Since 2011, 27 SDSU students have received awards from IEEE’s Power and Energy Society. That ranks sixth nationally and in the Midwest only the University of Illinois at Urbana-Champaign (35) tops SDSU.

## STEM Partnership

New program creates avenue for businesses to aid college's outreach

Companies wishing to support outreach activities of the Jerome L. Lohr College of Engineering have a new way of doing so, according to Dean Lew Brown.

STEM Partnership was created in fall semester 2016 and includes many familiar faces as well as a few new businesses, according to Tom Becker, development director at the SDSU Foundation for the Lohr College of Engineering. So far, 21 companies have joined at one of six different sponsorship levels and raised \$65,000.

The goal is to raise that figure to \$100,000 in 2017 by bringing in additional sponsors for science, technology, engineering and mathematics outreach events.

Signed on as a premier sponsor is Daktronics, the digital sign and scoreboard manufacturing giant headquartered in Brookings and founded by two former engineering faculty members. Among the perks as a premier sponsor is name recognition and having title sponsorship at a STEM event, such as the Jacks BEST Robotics Contest presented by Daktronics.

Leah Brink, corporate recruiter for Daktronics, said, "The STEM Partnership Daktronics enjoys with the Jerome J. Lohr College of Engineering is extremely important to us and to the future of our business. We know we need to encourage kids toward STEM fields now so that they'll be more likely to choose those majors in college and possibly be our employees in the future."

STEM Partnership dollars are used to finance the Engineering Expo, the Jacks BEST Robotics, Ready Set Go!, GEMS (Girls: Engineering, Mathematics, Science)

and TEAMS (Tests of Engineering Aptitude, Mathematics and Science), all one-day, school-year workshops and contests; and Youth Engineering Adventure and the Electrical Engineering Summer Camp, both weeklong summer camps on campus.

The idea is to show how an interest in science and mathematics can translate into a college major and a rewarding career.

**"We found that our partners really liked the idea of sponsoring all programs under the STEM Partnership. We have a number of partners that supported multiple programs."**

—Tom Becker, development director at the SDSU Foundation for the Jerome J. Lohr College of Engineering

The outreach programs were created individually through the years.

"We found that our partners really liked the idea of sponsoring all programs under the STEM Partnership. We have a number of partners that supported multiple programs. This required someone in the college to ask them for each program and thus multiple gifts would be made each year.

"This way, they can sign up for a sponsorship level and can support all of the outreach programs in a single



Students from Harrisburg High School collaborate on a question during the design-build phase of the TEAMS competition in the Lewis & Clark Room in the University Student Union Feb. 23. TEAMS (Tests of Engineering Aptitude, Mathematics and Science) is sponsored using the STEM dollars through the Lohr College of Engineering. This year, eight teams and 69 students participated. Harrisburg, which last year was a top 10 placer nationally, repeated as state champ in 2017.

transaction. In turn, the sponsors would be recognized at all events during the year and listed on the Lohr College of Engineering website as a STEM Partner," Becker said.

He noted that evidence of the STEM Partnership popularity can be seen in increased giving by some sponsors and the addition of sponsors like SDN Communications and Architecture Inc.

Brown noted that corporate sponsorship is vital for ensuring an affordable and memorable experience for students as well as their teachers and parents. In

2015, there were 844 students and 88 teachers from 145 schools in five states and three countries participating in the seven outreach programs. Furthermore, 90 percent of them were high school students, who soon are making life-shaping decisions, Brown said.

"Companies don't need to wait until the Engineering Career Fair to begin to make an impression on young minds," Becker said.

*Dave Graves*



## SPONSORSHIP BENEFITS

STEM partners and their employees can participate in K-12 outreach activities by the Jerome J. Lohr College of Engineering.

### Premier Level \$15,000

- Title sponsorship of two college STEM events at SDSU (e.g. Jacks BEST Robotics presented by Daktronics).
- Announced name at every college event as a premier partner.
- Free fall and spring college career fair registration and priority location selections.

### Diamond Level \$10,000 minimum

- Company name and logo on T-shirts printed for Lohr College STEM events.
- Announced name at every college event as a diamond partner.
- Free fall or spring college Career Fair registration and priority location selection.

### Platinum Level \$5,000 minimum

- Spotlight recognition on Jerome J. Lohr College of Engineering website with link.
- Exclusive invitations to see STEM activities on campus.

### Gold Level \$2,500 minimum

- Logo prominently displayed on banner at all Lohr College STEM events at SDSU.
- Annual appreciation plaque.

### Silver Level \$1,000 (Partner for Jacks BEST Robotics only).

- Recognition in game-day program and website.
- Guest speaker opportunities in classrooms or student organization meetings.
- Volunteer opportunities for employees.
- Annual appreciation certificate.

### Premier Level \$15,000

Daktronics

### Diamond Level \$10,000 to \$14,999

Northwestern Energy

### Platinum Level \$5,000 to \$9,999

First PREMIER Bank  
Raven Technologies  
Vision Brookings

### Gold Level \$2,500 to \$4,999

Sioux Industries  
U.S. Army ROTC

### Silver Level \$1,000 to \$2,499

3M  
Architecture Inc.  
Avera Health  
Citi  
East River Electric  
Electric Systems Inc.  
Falcon Plastics  
First Bank & Trust  
KPI-JCI Astec Companies  
Lowe's  
Malloy Electric  
SDN Communications  
Sideline Productions  
Xcel Energy

## CONTACT

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[Ned.Gavlick@sdsufoundation.org](mailto:Ned.Gavlick@sdsufoundation.org), 605-697-7475

**Tom Becker, development director**  
[Tom.Becker@sdsufoundation.org](mailto:Tom.Becker@sdsufoundation.org), 605-697-7475

# Iowa Resident Tuition Program at South Dakota State University

New incoming freshmen and new transfer students are eligible for **in-state tuition** at SDSU!

For more information about admissions  
Email: [sdsu.admissions@sdstate.edu](mailto:sdsu.admissions@sdstate.edu)  
Phone: 1-800-952-3541



**SOUTH DAKOTA  
STATE UNIVERSITY**



Kevin Moe

## Value of scholarships

### Students testify:

Scholars do make a difference  
But growing enrollment, rising costs  
present a challenge for administrators

“It takes a noble man to plant a seed for a tree that will someday give shade to people he may never meet.”

This quote from David Trueblood, a 20th-century educator and theologian, applies far beyond the scope of arboriculture. In fact, it may best be applied to the field of education and charity.

Tom Becker, development director for Jerome J. Lohr College of Engineering with the SDSU Foundation, said, “One of the founding principles of America was to have an educated populace. Through the generations, this concept has been carried forth and expanded. Now it is up to us to create opportunities for following generations to think, decipher, create and understand our role in the advancement of not just our country but all parts of the world we can touch.”

Sometimes that world is as close to our alma mater.

While new scholarships are continually being created, that growth isn't keeping up with the enrollment growth, especially in engineering.

Enrollment is up 23.5 percent between 2012 and 2016, from 1,577 to 1,948.

Kurt Bassett, head of mechanical engineering, said, “Our growing enrollments have far outpaced the increase in number of scholarships available for deserving students. As a result, the ability to attract and keep the best students has become more challenging. Also, college costs for students have risen faster than the value of scholarships.”

“In general, this means that our scholarships need to keep up.”

#### ‘I decided to do my part’

Among those responding to the call for scholarship growth is Kevin Moe, a 1988 computer science graduate, now of Rochester, Minnesota. He has been funding a Jackrabbit Guarantee (\$1,000 award) since 2007 and now funds two. In addition, in 2014 he began funding his own award—the Excellence in Scholarship in Computer Science, which is good for \$2,000 per year and is renewable.

“The reason I put this in place is I knew the value of scholarships,” Moe said of his Excellence in Scholarship.

“After being at the previous scholarship banquet, I was surprised at the low number of scholarships available for computer science. I decided to do my part when I had the means to do so,” said Moe, who spent 28 years with IBM, most recently as program director in WebSphere Development before leaving the computer giant in August 2016.

“For years, I was the lead recruiter for IBM. I always liked to see students who excelled. I have a lifelong passion for seeing students being able to achieve because they were financially able to go to school,” Moe said.

#### Scholarships make ‘my life less complicated’

Libby Molitor, a senior mechanical engineering major from Prairie du Sac, Wisconsin, said, “SDSU offered me the largest scholarship package of the schools that I was considering, which positively influenced my decision to attend.”

In fact, Molitor wasn't considering SDSU until she saw the scholarship package. “SDSU was slightly outside my comfort zone (460 miles away from home), and I may not have ever

**“If a department head is able to show these students our campus and engineering facilities, I believe the high-value scholarship is all that is needed to convince them that SDSU is the right school for them.”**

— Steve Hietpas, head of electrical engineering and computer science

attended here without the scholarships I received. They made out-of-state tuition a nonissue and made me feel wanted here.”

Molitor, who also is a pole vaulter on the track and field team, added, “My scholarships from SDSU have allowed me to make it through four years of college without taking out a loan or having to work during the school year. I am very grateful for that. It makes my life less complicated to be able to focus solely on my classes and the track team.”

### **Scholarships ‘incredibly influential in my decision’**

Selene Tinklenberg, a freshman civil engineering major from Sioux Falls, has taken a different approach to college.

“My time at SDSU has been filled to the brim with activities and studies. I have discovered what it means to be a Jackrabbit and make a difference on my campus and in my community. This is only possible because of the scholarships I was offered.

“Receiving these scholarships has allowed me to go through my first year of college without a part-time job. A job would have added stress to my life and taken away hours that I have used to instead get involved and maintain a high GPA.

“I have been so enriched by the groups and organizations I have been able to participate in,” said Tinklenberg, who is involved in seven activities.

“Receiving the scholarships that I did were incredibly influential in my decision to attend SDSU. It is very

important to me that I graduate debt-free and these scholarships and the affordable tuition at SDSU gave me that opportunity. After receiving these scholarships, I had no doubt about my decision to choose SDSU,” Tinklenberg said.

### **High-quality students highly recruited**

Tinklenberg’s education is being assisted by a Jerome J. Lohr Scholarship, a Leaders for Tomorrow Scholarship, a vocal scholarship and an Alpha Omega Epsilon Scholarship.

Molitor received a Briggs Scholarship, a Jackrabbit Achievement Scholarship and a women’s athletic award.

Steve Hietpas, head of electrical engineering and computer science, said, “High-quality, engineering-bound students, who have earned both high GPA and ACT scores, are being actively recruited by highly rated engineering programs in our region like the University of Minnesota, Iowa State, North Dakota State University and University of Nebraska-Lincoln.

“These universities offer these students substantial four-year scholarships. Some institution’s high-value scholarships are in the range of \$5,000 to \$10,000 per year and they are positioned to offer numerous discipline-specific scholarships for each of their engineering programs.

“The student weighs the overall package (scholarship, tuition and fees, room and board) along with the institution’s reputation as well as what the university and surrounding area has to offer.

“Fortunately, SDSU offers outstanding engineering programs at a very good price. However, they don’t necessarily have the same level of name recognition or engineering-program reputation as some of these other institutions. Increasing the value and number of discipline-specific, high-value scholarships, where the department head is engaged in the selection process, will have very positive impacts on the quality and reputation of our respective programs.

“If a department head is able to show these students our campus and engineering facilities, I believe the high-value scholarship is all that is needed to convince them that SDSU is the right school for them.”

### **To get started as a donor:**

Becker said, “donors can start their own scholarship at any amount, however, the greatest impact on the student will be made through scholarships with annual awards of \$2,000 to \$5,000. Many people also like to name their scholarship in honor or memory of someone who impacted them. The SDSU Foundation staff is ready to help walk new and existing donors through the process.”

*Dave Graves*

**To contact the foundation, call 888-747-SDSU (7348) or locally at 697-7475.**

**Send email queries to [tom.becker@sdstatefoundation.org](mailto:tom.becker@sdstatefoundation.org) or [ned.gavlick@sdstatefoundation.org](mailto:ned.gavlick@sdstatefoundation.org).**

## ENROLLMENTS BY DEGREE (fall 2015)

### Undergraduate Majors (fall 2016)

	Female	Male	Total	Percent
Ag & Biosystems Engineering	8	70	78	4.74
Civil & Environmental Eng.	45	212	257	15.61
Construction Management	14	170	184	11.18
Computer Science	16	209	225	13.67
Electrical Engineering	20	169	189	11.48
Electronics Engineering Tech	1	33	34	2.07
General Engineering	3	12	15	0.91
Operations Management	5	46	61	3.71
Mathematics & Statistics	62	80	142	8.62
Mechanical Engineering	45	426	471	28.61
<b>Total</b>	<b>219 (13.3%)</b>	<b>1427</b>	<b>1656</b>	<b>100.6</b>
Total (2015)	186 (12.4%)	1311	1497	
Total (2014)	198 (13.5%)	1265	1463	
Total (2013)	186 (13.0)	1247	1433	
Total (2012)	181 (12.9)	1218	1399	

### Master of Science Majors (fall 2016)

	Female	Male	Total	Percent
Ag & Biosystems Engineering	3	12	15	5.63
Civil & Environmental Eng.	6	42	48	16.92
Computer Science	19	30	49	18.42
Data Science	11	24	35	13.53
Electrical Engineering	11	27	38	14.29
Operations Management	6	7	13	4.88
Mathematics	3	10	13	4.88
Mechanical Engineering	3	32	35	13.53
Master of Engineering	0	2	2	0.75
Statistics	12	6	18	6.77
<b>Total</b>	<b>74 (27.82%)</b>	<b>192</b>	<b>266</b>	<b>99.6</b>
Total (2015)	60	183	243	
Total (2014)	67	260	267	
Total (2013)	57	156	213	
Total (2012)	43	138	181	

### Doctoral Majors (fall 2016)

	Female	Male	Total	Percent
Ag & Biosystems Engineering	6	7	13	18.75
Civil & Environmental Eng.	1	3	4	10.42
Computer Science & Statistics	4	17	21	39.58
Electrical Engineering	3	15	18	31.25
<b>Total</b>	<b>14</b>	<b>42</b>	<b>56</b>	<b>100.00</b>
Total (2015)	9	39	48	
Total (2014)	4	37	41	
Total (2013)	5	34	39	
Total (2012)	8	28	36	

### International Undergraduate Students

	Female	Male	Total	Percent Increase
Fall 2014	127			
Fall 2015	217	70.87		
Fall 2016	264	21.66		

## ENROLLMENTS BY PROGRAM (fall 2015)

### DEGREES CONFERRED (2015-16)

#### Undergraduate (July 1, 2016,-June 30, 2016)

	Female	Male	Total
Ag & Biosystems Engineering	0	10	10
Civil Engineering	4	38	42
Construction Management	2	35	37
Computer Science	2	15	17
Electrical Engineering	1	12	13
Electronics Engineering Tech.	0	4	4
Industrial Management	0	1	1
Mathematics & Statistics	11	10-	21
Mechanical Engineering	6	58	64
Operations Management	1	17	18
<b>Total</b>	<b>27</b>	<b>200</b>	<b>227</b>

#### Master of Science Majors

	Female	Male	Total
Ag & Biosystems Engineering	4	4	8
Civil Engineering	1	18	19
Computer Science	1	5	6
Data Science	1	6	7
Electrical Engineering	4	11	15
Mathematics	2	2	4
Mathematics-statistics specialization	0	2	2
Mechanical Engineering	2	18	20
Operations Management	2	4	6
Statistics	3	3	6
<b>Total</b>	<b>20</b>	<b>73</b>	<b>93</b>

#### Doctoral Majors

	Female	Male	Total
Ag & Biosystems & Mechanical	1	3	4
Electrical Engineering	0	2	2

### College of Engineering Facilities

	Sq. Ft.
Agricultural Engineering	48,696
Crothers Engineering Hall	89,960
Daktronics Engineering	73,464
Solberg Hall	55,735
Architecture, Mathematics & Engineering Building	62,000

### Jackrabbit Guarantee Scholarship recipients (2016-17)

First Year	\$467,400	233
Second Year	\$288,400	122
Third Year	\$252,950	99
Fourth Year	\$182,325	64
<b>Total</b>	<b>\$1,191,075</b>	<b>518</b>

Average award per year: \$2,299

Total undergraduate enrollment: 1,627

# Youth Camps

SDSU Jerome J. Lohr  
College of Engineering:  
[www.sdstate.edu/engr/](http://www.sdstate.edu/engr/)

## Engineering Expo & Physics Bowl

DATE: April 28, 2017, 9 a.m. – 3 p.m.  
LOCATION: Swiftel Center, Brookings  
CONTACT: (605) 688-4161, [sdsu.engineering@sdstate.edu](mailto:sdsu.engineering@sdstate.edu),

## Youth Engineering Adventure

DATE: July 9-14, 2017  
LOCATION: on campus  
CONTACT: [Geoffrey.Bonvallet@sdstate.edu](mailto:Geoffrey.Bonvallet@sdstate.edu), (605) 688-4977,  
[www.sdstate.edu/youth-engineering-adventure](http://www.sdstate.edu/youth-engineering-adventure)

## ACE (Aerospace Career and Education) Camp

DATE: July 9-12, 2017  
LOCATION: on campus  
CONTACT: [Cody.Christensen@sdstate.edu](mailto:Cody.Christensen@sdstate.edu), (605) 688-4983,  
<https://southdakotastate.prod.acquia-sites.com/consumer-sciences/ace-camp>

## Electrical Engineering Camp

DATE: July 30-Aug. 5, 2017  
LOCATION: Daktronics Engineering Hall  
CONTACT: [Cory Mettler](mailto:Cory.Mettler@sdstate.edu), (605) 688-5306, [cory.mettler@sdstate.edu](mailto:cory.mettler@sdstate.edu),  
[www.sdstate.edu/electrical-engineering-and-computer-science/2017-south-dakota-state-electrical-engineering-camp](http://www.sdstate.edu/electrical-engineering-and-computer-science/2017-south-dakota-state-electrical-engineering-camp)

## BEST Robotics

DATE: Oct. 28, 2017  
LOCATION: Swiftel Center  
CONTACT: [Kim Prohaska](mailto:Kim.Prohaska@sdstate.edu), [kim.prohaska@sdstate.edu](mailto:kim.prohaska@sdstate.edu) or 605-688-6268,

## Ready, SET (Science, Engineering, Technology)-Go! — Nov. 18, 2017

LOCATION: Crothers Engineering Hall  
CONTACT: [Rich Reid](mailto:Rich.Reid@sdstate.edu), [Richard.reid@sdstate.edu](mailto:Richard.reid@sdstate.edu), (605) 688-4161,

## TEAMS (Tests of Engineering Aptitude, Mathematics and Science)

DATE: Late February 2018  
LOCATION: Volstorff Ballroom, University Student Union.  
CONTACT: [Kim Prohaska](mailto:Kim.Prohaska@sdstate.edu), [kim.prohaska@sdstate.edu](mailto:kim.prohaska@sdstate.edu) or (605) 688-6268.

## Eastern South Dakota Science and Engineering Fair

DATE: Mid to late March 21, 2018  
LOCATION: Frost Arena  
Contact: [Brad Blaha](mailto:Brad.Blaha@sdstate.edu), [Bradley.Blaha@sdstate.edu](mailto:Bradley.Blaha@sdstate.edu), (605) 688-5133,  
[www.sdstate.edu/science-and-engineering-fair](http://www.sdstate.edu/science-and-engineering-fair)

## GEMS (Girls, Engineering, Mathematics and Science)

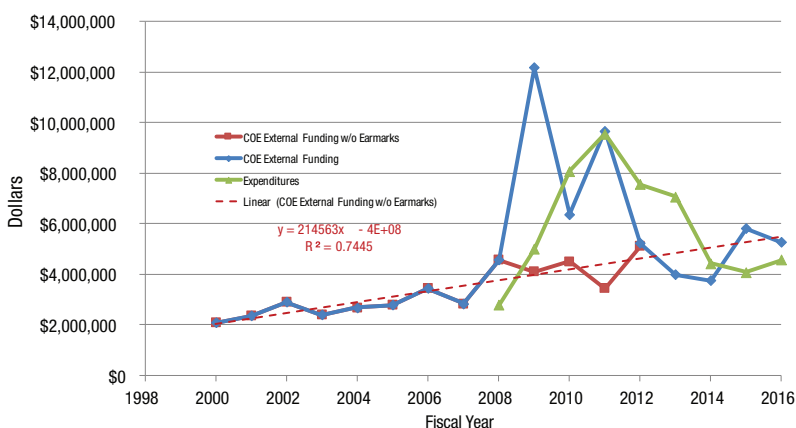
DATE: March 24, 2018  
LOCATION: Crothers Engineering Hall  
CONTACT: [Rich Reid](mailto:Rich.Reid@sdstate.edu), [Richard.reid@sdstate.edu](mailto:Richard.reid@sdstate.edu), (605) 688-4161

## Program Design Challenge

DATE: early April 2018  
LOCATION: on campus  
CONTACT: [Jerry Cooley](mailto:Jerry.Cooley@sdstate.edu), [jerry.cooley@sdstate.edu](mailto:jerry.cooley@sdstate.edu), or (605) 688-6618;  
[Myounggyu.Won](mailto:Myounggyu.Won@sdstate.edu), [Myounggya.Won@sdstate.edu](mailto:Myounggya.Won@sdstate.edu), (605) 688-5703  
[www.sdstate.edu/eecs/program-design/index.cfm](http://www.sdstate.edu/eecs/program-design/index.cfm).

Unless noted, camp information can be found at:  
<http://www.sdstate.edu/jerome-j-lohr-engineering/stem-youth-camps-and-activities>

## College of Engineering External Funding



**Impulse**  
**ONLINE**  
[www.sdstate.edu/engr/](http://www.sdstate.edu/engr/)



## 2017 Phonathon

marching toward \$250,000 goal

**E**ngineering students have completed their thank-you calls to donors who contributed to the 35th annual Jerome J. Lohr College of Engineering Phonathon, which began Jan. 16.

The phonathon, conducted by PhoneJacks with the SDSU Foundation, raises funds for scholarships, new laboratory equipment and student organization support, such helping clubs enter engineering contests or attend professional conferences.

Erin Glidden, the SDSU Foundation's director of annual programs, said follow-up calls will continue through the end of the spring semester and direct mail pieces have been sent to alumni who couldn't be reached by phone. The goal for 2017 is \$250,000, which is a bump of 4.5 percent from the nearly \$240,000 raised in 2016. Through Feb. 27, Glidden reports 610 alums have donated \$117,000.

She notes there were 1,245 donors in 2015, so she expects a large base of donors will be making their mark yet this spring.

"We are not quite where we want to be, but are confident the college's alumni base will answer the call and help us have a successful campaign so we can meet the needs of the departments and our students," Glidden said. "We know our alums are very loyal and faithful to help meet the needs of their alma mater."

Support for the college has come from virtually every state in the union. As of Feb. 27, donations have come from 42 states with only Hawaii, Louisiana, Kentucky, New York, Delaware, New York, Vermont and Maine yet to be colored blue on the donor map. (See accompanying graphic.)

Because of growing enrollment and the addition of nine programs since 2012, the paramount need within the college is for scholarship funds, Glidden said. In just five years (2012-16),

enrollment has climbed 23.5 percent from 1,577 to 1,948 and scholarship growth hasn't kept pace, she said.

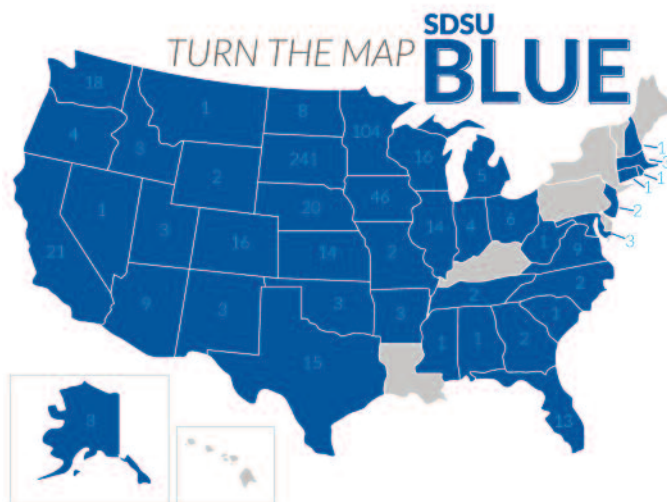
Glidden added the need is particularly great in newer departments where the alumni base is smaller and fewer graduates have entered their prime giving years.

Nonetheless, she hopes all graduates establish the habit of giving to their alma mater and "paying forward" the learning opportunity to the next generation.

In the Department of Civil and Environmental Engineering, one of the largest and most established departments, there are 310 students and 47 scholarships (15 percent). By contrast, computer science has 274 students and six scholarships (2 percent).

Those who would like to make an immediate impact can give securely at <https://www.sdstatefoundation.org/give-now>. Donations can still be designated specifically to the Lohr College of Engineering or a specific department.

*Dave Graves*



# Drone testing

## Seo uses drone in test of bridge inspections

Shippers are using them, farmers are using them and bridge inspectors could be using drones, too.

Just how effective those unmanned aerial vehicles can be in replacing hands-on inspectors has been the focus of a yearlong study by Junwon Seo, an assistant professor in the Department of Civil and Environmental Engineering. The \$50,000 study, financed by the UDSA's Forest Service, wraps up June 30.

The key bridges inspected by Seo and graduate student Luis Duque are two bridges at the Keystone Wye within the Black Hills National Forest.

Seo, who spent more than 10 years doing research on bridge behaviors by traditional methods with the Pennsylvania and Iowa departments of transportation before joining the SDSU faculty 3 ½ years ago, said he is pleased with the video and still images produced by the drone. They were able to find all of the damaged areas that the South Dakota Department of Transportation had previously noted on the bridges.

Seo described traditional inspection methods as tedious and cumbersome that also require the closure of the bridge for several days.

Typically, bridges are too high to send an inspector up a ladder, so one is placed in the bucket of a specifically designed, expensive boom truck to take pictures and make visual inspections. Height and clearance are no problem for the drones, which the Federal Aviation Administration allows to fly up to 400 feet high, Seo said.

After the images are captured, they are analyzed using an algorithm that Seo customized to definitively determine the length and width of cracks. In a future study, Seo hopes to use drone-captured data in determining a bridge's remaining longevity and its capacity.

Seo said the project was his first experience in using a drone. Grant funds were used to purchase a \$2,000 Phantom 4 drone with a Geo Pro camera and an iPad. He and Duque operate the drone under the regulations stipulated by the FAA. They did test inspections on footbridges at Sexauer Park and Dakota Nature Park in Brookings.

Seo and Duque learned that one drawback in using the 3-pound drone is wind gusts. "When wind is more than 15 mph, it is really challenging to operate the drone and take the pictures," Seo said.

At Keystone, the first day of inspection the weather was perfect with a wind speed of 8 mph, he said. On the second day, wind was gusting at 25 mph. "So we just took the bridge overview and didn't fly close to the bridge. We just took pictures of big components like stringers and posts," said Seo, noting they were able to get within 18 inches of the bridge on day one.

In all flights, use of the drone was a two-man project—one to control the drone and the other to keep an eye on the drone in case it was veering toward an obstacle.

FAA rules don't allow bridge inspectors to fly over traffic, but that wasn't a problem in obtaining the needed images at Keystone, Seo said.

*Dave Graves*

Junwon Seo, right, and his graduate student Luis Duque enter programming information into an iPad before testing drone technology to inspect and assess the condition of timber bridges, such as this one at Sexauer Park in Brookings, on a mild Feb. 10, 2017, afternoon.



## A baker's dozen of new faces have popped up in the Lohr College of Engineering in this school year. A brief profile of each follows.

### Marco Ciarcia



Ciarcia, an assistant professor in mechanical engineering, hails from Palermo, Sicily, Italy. He received his college education there at the Università degli Studi di Palermo. With no

bachelor's program available when he enrolled in 1994, he immediately began pursuit of a master's degree in aerospace engineering, which he received in 2001.

In 2003, he enrolled at Rice University in Houston to pursue a doctorate in mechanical engineering. His focus was theoretical and numerical optimization of spacecraft and aircraft trajectories. He received his doctorate in January 2008.

In September 2007, he returned to Università degli Studi di Palermo as a postdoctoral fellow and investigated theoretical optimization of collision avoidance trajectories for ground effect aircraft as well as evaluating collision avoidance capability through high fidelity model simulations.

In November 2009, he returned to Rice as a visiting researcher and investigated aircraft trajectory optimization techniques as well as developing strategy for automated collision avoidance trajectory generation for an aircraft in landing phase.

From July 2010 to October 2014, he was a National Research Council research associate at Naval Postgraduate School in Monterey, California, where his work included developing algorithms for real-time trajectory optimization, designing and experimentally validating suboptimal guidance strategies at the Spacecraft Robotics Laboratory and creating guidance software for minimum energy orbital proximity maneuvers.

Before arriving at SDSU in fall 2016, Ciarcia worked as the chief research engineer at NANOCOMSAT in Zurich, Switzerland, where he began in January

2015. His responsibilities included space flight mechanics specialist and guidance, navigation, and control software designer.

At SDSU, he teaches automatic controls and nonlinear programming. While Ciarcia comes to a school that doesn't have an established aerospace program, he sees an advantage in starting a program from scratch.

Currently, he is working to establish an aerospace robotics testbed laboratory that will be used for both research and teaching. Ciarcia adds, "These days you don't need an established aerospace program to access space. With the advent of small satellite technologies, it takes less than \$80,000 to design, develop and launch your own small satellite and perform experiments in orbit."

He said he enjoys the department's welcoming nature, its multicultural environment and its promising plans to boost the research effort.

Outside the university, he enjoys photography, backpacking, archery, tennis and guitar. A traveler and an outdoorsman, two years ago he and his wife, Anna, went on a road trip from Monterey to Denali, Alaska, and back. "We had a blast!"

### Lisa Enstad



Enstad, a Hendricks, Minnesota, native is completing her first year at SDSU, where she serves as senior secretary in the Department of Civil and Environmental Engineering.

She holds a bachelor's degree in business administration from Southwest Minnesota State University in Marshall and previously worked at Daktronics. Enstad said, "I am lucky to get to work with people who are very friendly and knowledgeable."

In her spare time, she likes to try new restaurants, watch movies and spend time

with family and friends. She and her husband, Jesse, live in Hendricks with their son, Jett.

A sister, Laura Hall, also works on campus. "So if you receive a confusing look, it may not be me."

### Rachel Flaskey



Flaskey, a Montana native, began work in December 2016 as the college's budget coordinator, a new position created following Barb Dyer's retirement.

It requires her to manage the college's finances through auditing, analyzing, monitoring, processing and forecasting as well as serve as the liaison between university administration and the engineering departments.

She has worked at SDSU since 2010. Prior to joining the college, Flaskey served as the university scholarship coordinator in the Enrollment Services Center, monitoring all academic SDSU Foundation and nonSDSU Foundation scholarships. She was a financial aid counselor in 2012-13 and a secretary for the Department of Counseling and Human Development in 2010-12.

Before coming to SDSU, Flaskey was a personal banker at Wells Fargo, 2006-10, and manager of Claire's Accessories in Brookings, 2003-06. Since 2010, she also has been business director for her husband's business, Flaskey Chiropractic and Acupuncture.

Flaskey earned a bachelor's degree in sociology from SDSU in 2003 and followed that with a master's in business administration/marketing from the University of Phoenix in 2005.

She said she enjoys the school spirit at SDSU. "Students, faculty and staff, along with the Brookings community, strive to



support the university. There is really a sense of pride with being a Jackrabbit.”

Flaskey and her husband, Jason, have three children—Ava, 7; Jaxon, 5; and Wyatt, 3. They enjoy camping, boating and hiking. Should they venture into a cave, Flaskey is prepared to lead them. In high school and college, she led guided cave tours at Rushmore Cave near Mount Rushmore.

### Barbara Fourney



Fourney, a native of Reading, Pennsylvania, began as the electronics lab manager in the Department of Construction and Operations Management in July 2016.

However, she is no stranger to the college. She worked as an embedded software engineer in the Engineering Research and Alternative Power Technology offices in 2010-13. That included work on an SDSU grant to develop the microgrid testbed facility in the college. She also worked part time as an embedded software engineer with Daktronics and other private companies since the family moved to the area in 2003.

From 1986 to 2003, she was an electrical engineer at Johns Hopkins University’s Applied Physics Lab in Baltimore, Maryland. Her work there was in oceanography research and discovery and routinely involved taking equipment out on extended sea tests.

In her current position, she assists in electronics technology lab sections and manages the electronics technology lab as well as multidepartmental shops in the Architectural, Mathematics and Engineering Building. She appreciates the opportunity to interact with students. “They are great!”

Fourney earned an associate degree in computer science from Penn State in 1983 followed by a bachelor’s degree in electrical engineering in 1986. She earned her master’s in electrical engineering from Johns Hopkins in 1993. In her spare time, Fourney enjoys reading, quilting,

needlepoint, music and that much-craved treat, sleeping.

Her husband, Bob, is an associate professor in electrical engineering. They have two children, Ben, 18, and Jessica, 11.

### Rouzbeh Ghabchi



Ghabchi is an assistant professor in the Department of Civil and Environmental Engineering, where he teaches pavement design, highway and traffic engineering, and bituminous

materials and does research on transportation infrastructure materials, performance enhancement of asphalt pavements, green paving technologies and highway engineering.

His work experience has been in pavement design, characterization of transportation infrastructure materials, and design of concrete and steel structures.

Prior to coming to SDSU in August 2016, he was a postdoctoral research fellow at the University of Oklahoma, working as principal investigator and co-principal investigator on several research projects funded by the Oklahoma Department of Transportation, the Southern Plains Transportation Center and the Oklahoma Department of Environmental Quality.

He received his doctorate in civil engineering from the University of Oklahoma in 2014. His bachelor’s and master’s degrees were earned from the University of Tabriz in 1999 and 2002, respectively.

Ghabchi is a native of Tabriz, Iran, relatively near the Caspian Sea. After living in Oklahoma for eight years, he said his first winter in South Dakota has been “a unique experience.” He said SDSU has “friendly people and a wonderful work environment.”

Ghabchi, who is single, said he enjoys sports, hiking and reading.

### Zheng Hao

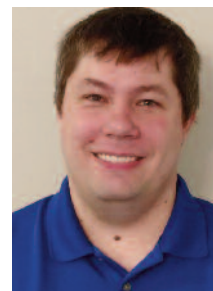


Hao, a native of China, is a lecturer in the Department of Mathematics and Statistics, where he teaches calculus, probability and statistics and time series.

Before arriving at SDSU in fall 2016, Hao was a lecturer at the University of Wisconsin-Stout in 2014-16. He earned his doctorate in mathematics from Kansas State in 2014 and his bachelor’s degree in mathematics and statistics and economics from Peking University in 2007.

Hao, whose wife and son are living in Ithaca, New York, at this time, enjoys working out at the gym. He also has had fun skiing at Great Bear Recreation Park in Sioux Falls and shooting archery at the Outdoor Adventure Center in Brookings.

### Nathan McClanahan



McClanahan, a Brandon native, is back at SDSU after completing his doctorate at Montana State University in 2016.

A lecturer in the Department of Mathematics and Statistics, McClanahan is teaching undergraduate courses. He had previously taught as a graduate assistant at SDSU and Montana State. McClanahan earned bachelor’s degrees in mathematics and physics in 2006 and a master’s in mathematics in 2008.

While living in Eagle River, Alaska, he made a trip to Denali, the highest peak in North America. But he said he is glad to be back in Brookings to attend SDSU sporting events again and enjoys working with his colleagues, some of whom he taught him.

In addition to attending Jackrabbits athletic events, McClanahan enjoys reading, watching movies and playing with his children. McClanahan and his wife, Carrie, have two children, Amelia, 6, and Aiden, 1.

## Kim-Doang Nguyen



Nguyen, an assistant professor in mechanical engineering, is a native of Tuy Hoa, Vietnam.

He started at SDSU in January. The newcomer is doing research in

robotics and controls as well as teaching courses in machine design, robotics and controls. Nguyen came to State via University of Illinois at Urbana-Champaign, where he was a postdoctoral research associate in the Department of Mechanical Science and Engineering.

For the six years prior, he was a research assistant, then a postdoctoral researcher in the Department of Mechanical Science and Engineering at the University of Illinois at Urbana-Champaign.

During this time, he invented a brush-belt design for seed-delivery systems and developed robotic systems for crop and orchard inspection and treatment. He also studied delay differential equations, adaptive systems and the cooperative control of robotic networks.

His previous work experience was in Singapore.

From 2007 to 2010, Nguyen served as a project officer in the Department of Mechanical and Aerospace Engineering at Nanyang Technological University. He developed a motion capture system for continuous monitoring of human arm movement and designed graphical software and experiments for validating the motion capture system.

In 2005-06, Nguyen was a research intern at Singapore Institute of Manufacturing Technology, where he formulated recursive algorithms for generating smooth motion profiles and designed an experimental testbed of a linear motor sliding on an air-bearing system for validating motion planning algorithms.

Nguyen earned his bachelor's (2007) and master's (2010) degrees at Nanyang Technical University, both in mechanical engineering. He earned his doctorate in

mechanical engineering from the University of Illinois at Urbana-Champaign in 2015.

He describes SDSU with having a beautiful campus with kind students and staff.

Outside interests include playing soccer and table tennis, reading science fiction books and watching "Doctor Who."

He and his wife, Trinh, live in Brookings with their son, Benjamin.

## Cibele Teixeira Pinto



Pinto, who hails from Sao Jose dos Campos, Sao Paulo, Brazil, began Jan. 4 as an imaging engineer in Engineering Research, but she also lived in Brookings October

2014 to October 2015 while she was a visiting research scholar working on her doctorate.

She started Jan. 4 at SDSU, where she assists in directing research focused on the radiometric, geometric and spatial characterization and calibration of satellite and airborne sensors systems.

Also, she teaches the graduate-level Advanced Image Processing course.

Pinto was a doctoral student from March 2013 to July 2016, when she received her degree in remote sensing from the Institutional Training Program at the National Institute for Space Research in Brazil.

From July 2011 to February 2013, she was in the Institutional Training Program at the institute, where she developed an image-quality verification plan focused on the absolute and spectral calibration of sensors onboard the CBERS-3 satellite.

She participated in the Undergraduate Research Mentorship Program at the Institute for Advanced Studies in the Brazilian Department of Aerospace Science and Technology from April 2006 to December 2008. The program sought to develop a methodology to determine the spectral response function of electro-optical sensors.

Pinto earned her bachelor's degree in mathematics in 2008 and her master's in remote sensing in 2011, both from the National Institute for Space Research in Brazil.

She said she couldn't be happier with her start at SDSU. "I have the opportunity to work on what I always dreamed to do for my life. My co-workers and I have a great relationship that contributes to the advance of our laboratory and for myself as a professional. Plus, SDSU in general is a friendly community."

Her outside interests are running, swimming and reading. "Books are always on my nightstand."

Swimming is a relatively new interest. "At the age of 25, I decided to learn swimming. I had no idea whether I could really learn or not. One year later, after practicing three to four days a week, I won a gold medal in an open water (sea) swimming championship. It was unbelievable!"

She is married to Pedro Valle.

## Becky Pistulka



Pistulka, who was born and raised in Pittsfield, Illinois, began Dec. 1, 2016, as the curriculum, outreach and events coordinator, duties previously held by the now-retired Barb Dyer.

She said, "I have enjoyed working with the students on different activities. The days are never the same; always something exciting going on."

Pistulka, who lives in Arlington, was named 2016 Person of the Year by the community for her volunteer work. She spent three years as secretary of the Chamber of Commerce, has been active in her church, currently serving as CCD religious education co-coordinator, and helps with fundraising for her daughters' school events.

Pistulka, who holds a bachelor's degree in business administration from Truman State University, Kirksville, Missouri, was a live events sales coordinator at Daktronics

in Brookings from 2007 to 2016. The family moved here in 2007 from Greybull, Wyoming.

Outside interests include going to garage sales and flea markets as well as antiquing and joining the family in mini-rod tractor pulling, which has taken them to 10 states.

She and her husband, Louie, have two daughters, Karley, a freshman at SDSU, and Kasey, a seventh-grader at Arlington School District.

### Douglas Prairie



Prairie, a native of Balaton, Minnesota, is an instructor in the Department of Ag and Biosystems Engineering.

He brings 20 years of experience to the position.

Prairie, who now lives in Sioux Falls, was hired as a temporary instructor in fall 2016 and the temporary tag was removed for spring semester.

He teaches in both ag engineering and ag systems technology specializing in courses covering ag power and machinery, fluid power and precision agriculture.

“I have enjoyed getting to know the students and feeding off their energy and positive viewpoints on life. I feel like my 20 years of experience can really help them be better prepared for industry when they graduate,” Prairie said.

The 1997 SDSU ag engineering graduate joined Case New Holland in Fargo, North Dakota, after graduating. He was a product development engineer in the Concord Air Seeder group until 2000, when the facility was closed. He worked six months with Synchroness in Boise, Idaho, and then took a job as a project engineer at Multiquip, a construction equipment manufacturer, in Boise.

He served as a project engineer at Bratney Companies, a design-build contractor for ag buildings, in Boise, from 2003 to 2005. Prairie then returned to Multiquip as an engineering manager for

two years. That job ended as the economy faltered in 2007.

From 2007 to 2010, he was a freelance engineer doing business as Prairie West LLC in Boise. Also during the 2009-10 school year, Prairie was an adjunct professor at Boise State. Prairie earned his master’s degree in mechanical engineering from there in 2004.

In 2010, Prairie returned to the Midwest, working as project manager and then North American sales manager in precision ag technologies with Raven Industries, Sioux Falls, until 2015. He then spent a year as a mechanical research manager with Poet Research Group in Sioux Falls.

Outside interests include vegetable gardening, downhill skiing and assisting his boys with their Boy Scout activities.

Prairie and his wife, Julie, have three children—11-year-old triplets, two boys and a girl.

### Anamika Prasad



Prasad, a native of India, is an assistant professor in mechanical engineering, teaching courses in engineering materials and doing research in biomechanics and biomaterials.

Before coming to SDSU in fall 2016, Prasad was an assistant professor in applied mechanics at IIT, Delhi, India, (2013-2016) and a visiting assistant professor at University of Washington in Tacoma (2015-2016). She did postdoctoral research in bioengineering at Stanford University in 2009-11.

She earned a doctorate in materials science and mechanics in 2007 and a master’s in civil and environmental engineering in 2003, both from Massachusetts Institute of Technology. She earned a bachelor’s in civil engineering from the Indian Institute of Technology-Varanasi, India, in 1997.

Prasad has advised multiple startups and worked with incubators in India and

in California (DoveTail Care, Palo Alto, California; Innovators Lab Consultants, Delhi, India; Biotechnology Ignition Grant in the Department of Biotechnology, India).

Before returning back to academics, Prasad worked in the engineering industry in Exponent, Menlo Park, California, (2007-08) and Engineers India Limited, Delhi, India (1997-2001).

Prasad and her husband, Dhjraj, have a daughter, Trisha, 12, and a son, Vedit, 9. The family recently moved to Brookings.

### Jonathan Wood



Wood, a native of Vernal, Utah, is an assistant professor in the Department of Civil and Environmental Engineering, where he teaches Elementary Surveying, Intro to

Traffic Safety, Highway Design, Statistical and Econometric Analysis Methods for Engineers, and Advanced Highway and Roadside Design.

Before joining the department in August 2016, Wood was a graduate instructor in civil engineering at Penn State, where he earned his doctorate in civil and environmental engineering. He also was a graduate research assistant at Penn State from 2013 to 2015.

He spent 2012 as a graduate research assistant at the University of Utah, where he earned his master’s degree in civil and environmental engineering in 2012. He earned his bachelor’s degree in civil and environmental engineering from Utah in 2011. During his senior year, he was an undergraduate research assistant in the department.

Wood also gained experience as a survey technician and draftsman at Timberline Land Surveying in Vernal in 2008-09.

He and his wife, Emily, have three children, Nathan, 5; Makayla, 1; and Brynlee, 3 months.

## Faculty awards

The following were presented Feb. 21 at the Celebration of Faculty Excellence



### Faculty Engagement in International Research

*Qiquan Qiao, Harold C. Hohbach*  
associate professor in electrical engineering

Qiao, whose relatively young and distinguished career was capped by being selected as an endowed professor, is an internationally renowned researcher in solar cells/renewable energy.

He has been persistently taking his research global by establishing four funded international projects totaling more than \$1 million between SDSU and four overseas institutions. He has published 27 joint journal papers with international collaborators and hosted 11 visiting or exchange scholars in his lab.

Qiao has given dozens of presentations or seminars at more than 10 international conferences and institutions. He is the recipient of the 2009 Bergmann Research Award from the U.S.-Israel Binational Science Foundation. The overseas institutions with which he has collaborated include ones in Israel, Pakistan, Egypt and China.

In addition to these four funded projects, Qiao has been awarded more than 20 external competitive research grants, including the prestigious National Science Foundation CAREER award.

In addition, Qiao's international stature in the field of solar energy has attracted top international researchers and students to SDSU, consequently enhancing SDSU's visibility and reputation with international research communities.



### Excellence in Online Teaching

*Sara Clark, lecturer in mathematics and statistics*

Clark has taught online courses in Survey of Calculus, and College Algebra and Lab. She prepared

the Survey of Calculus course for online delivery after teaching the on-campus course for several years. She also assisted in creating the materials for the College Algebra Lab when first offered online.

In order to make the course relevant and useful to students, Clark has weekly group assignments in her Survey of Calculus course that include applications from economics, pharmacy, management and other majors of students who are required to take this course.

Clark's focus when teaching each of the online courses is to make her students feel like they are involved and an integral part of the class no matter where they are located.

The students who take these classes range from high school dual credit students to traditional college students to non-traditional students.

Clark has seen improvement in both grades and attitude throughout the semesters as she has implemented more group work and discussion board usage in her classes. She has received positive comments from both students and colleagues about her communication skills and dedication to helping her students succeed.



### Outstanding Researcher Award for the Lohr College of Engineering

*Nadim Wehbe, John M. Hanson professor in Structural and Construction Engineering and head of civil and environmental*

*engineering*

Wehbe, who arrived at SDSU in January 1998, helped establish the Lohr Structures Laboratory in 2002. Since it was founded, the lab has been the site for numerous research studies involving full-scale testing of bridge, building and industrial structural systems.

Wehbe's main research interests include earthquake resistant structures and bridge engineering. Many of his research studies

have focused on improving the transportation infrastructure in South Dakota.

The results of his research have been published in peer-reviewed journals and reports and presented at national and international forums. His work on the development of new detailing for improved performance of double tee bridge girders in South Dakota received national recognition in 2015 as one of 16 "high-value research projects" in the nation.

Wehbe has been successful in obtaining external grants from the National Science Foundation, the U.S. Department of Transportation, the South Dakota Department of Transportation and many private sector institutions.

Wehbe also is a fellow of the American Society of Civil Engineers, the American Concrete Institute and the Structural Engineering Institute.



### Young Investigator

*Chris Saunders, assistant professor in mathematics and statistics*

Saunders will be recognized with this award from the Lohr College of Engineering at the Distinguished

Engineers banquet April 25.

Saunders and his colleague, assistant professor Cedric Neumann, are developing and evaluating statistical models designed to determine the probability values for evidence like glass shards, fingerprints, bullets and handwriting through a three-year (2014-17), \$780,300 grant from the National Institute of Justice.

They are the first SDSU statisticians to receive such a grant. Neumann received the Young Investigator Award in 2016.

Saunders has been on the faculty since August 2012, coming here from George Mason University in Fairfax, Virginia, where he also worked as an intelligence community fellow with the FBI.

# Distinguished Engineer

Latif honored for his work in engineering education

*Niaz Latif is alone in the 41st class of Distinguished Engineers at South Dakota State University. His selection brings to 138 the number of persons initiated since Dean Junis O. Storry began the award in 1977. Latif's plaque will be added to the Wall of Fame in Crothers Engineering Hall, and he will be honored at an April 25 banquet.*

Niaz Latif piled up three degrees in engineering in his 11 years of pursuing higher education in his home country of Bangladesh, SDSU and the University of Missouri.

However, his gift in communication is what set him apart from his peers and put him in position to be honored as a distinguished engineer by the Jerome J. Lohr College of Engineering. Latif, the chief administrative and academic leader of the College of Technology at Purdue University Northwest in Hammond, Indiana, has spent his entire U.S. career in academics.

Even before he came to the United States, Latif said he realized he had the ability to communicate and explain concepts to others.

"I had been told I had the unique capability to explain. People always told me I can articulate very well if I have a clear understanding of a subject. I was told, if I pursue that, I would make a good teacher. My adviser (Leslie Christianson) at South Dakota State felt the same way and told me I could become a professor if I got my doctorate," Latif said.

So, after earning master's degrees in mechanical engineering (1983) and agricultural engineering (1985), he studied for his doctorate in ag engineering from the University of Missouri (1988).

Latif's doctorate was awarded Aug. 11, 1988. Eight days later he was teaching the pre-engineering program to freshmen and sophomores at a rural Louisiana State University campus in Eunice. It was a two-year school and that's how long Latif stayed. He then spent nine years teaching at

Northern Kentucky University before moving into administrative roles in the Purdue University system, first at the main campus in West Lafayette, Indiana.

After seven years as a department head and one year as assistant dean, Latif sought to become a dean and landed his current post at Purdue Northwest in 2007.

## 'Raised the bar again'

"As I started teaching, I realized I have traits like communication and relevant people skills. I can explain matters to the constituency and get more accomplished whether it be new program development, grants or cooperation with industry. My job is to make a case and motivate people around me to accomplish those goals.

"I have been striving to make a big difference for the academic unit. Every time I reached a certain target, I raised the bar again," he said.

His achievements at Purdue Northwest include securing external support for the first endowment fund in the College of Technology in support of academic programs when in 2008 Latif initiated a bachelor's degree program in mechatronics engineering technology.

He also has established the Center for Packaging Machinery Industry, which is the "premier resource center for the packaging machinery industry through collaboration between industry partners and the college," according to Mohammad Zahraee, associate dean for graduate studies in the College of Technology.

Most recently, Latif established the Commercialization and Manufacturing Excellence Center in Northwest Indiana in 2015 and secured significant funding for the facility. He is its executive director.

## His initial interest in SDSU

Latif was selected as a Distinguished Alumnus by the SDSU Alumni Association in 2015. In advance of that Hobo Day recognition, Latif reflected, "I came to State following the path of a childhood friend,

who was a chemistry major at State. He motivated me to come

to South Dakota State for its small class size, excellent faculty and affordable living."

Latif was concerned about the cost of living in Brookings and expressed those thoughts in a letter to then-faculty member Clayton Knofczynski. "He replied that the cost depends on how you live. It can be quite reasonable," Latif said, noting that was the start to a close relationship.

He took a class from the mechanical engineering professor and did quite well. "The next semester he hired me as a grader. The next semester I was his teaching assistant. He was very good to me. I wanted to be like him with my students. He was kind enough to visit me in Louisiana. He sat in my class while I was teaching."

Kurt Bassett, current mechanical engineering department head, was a classmate. Professor Fred Delfanian was one of his ME advisers.

Latif also had high marks for Christianson, his academic advisor, and Mylo Hellickson, head of the ag engineering department.

## 'A true leader'

Today, Latif is 63, but still finds excitement in his job, where he is responsible for overseeing seven undergraduate programs and two graduate programs housed in three academic departments in the college. He has oversight of 67 faculty and staff, 30 lecturers, 1,100 undergraduate students and 125 graduate students.

Latif and his wife, Dilara, live in Munster, Indiana. They have two children. Their daughter Shehreen and her husband Neil live in Peterborough, Ontario. Their son Mehran resides in Highland, Indiana.

*Dave Graves*





## Longtime EE professor **Alfred Andrawis** dies

Professor Emeritus Alfred Andrawis, 69, died Jan. 1, 2017, in Alexandria, Virginia, as a result of cancer.

Andrawis, a member of the electrical

engineering and computer science department, retired June 21, 2013.

During more than a quarter-century as a full-time faculty member at SDSU, he became known to students and colleagues as much for his sincere interest in them as his technical expertise.

The impact became apparent to the family after Andrawis' passing with a flood of messages from students, colleagues and family friends testifying to Andrawis' remarkable character and personality.

Duane Sander, dean of the college from 1987 to 1999 and a member of the electrical engineering faculty from 1967 to 1987, wrote, "Alfred was a friend who was always thinking of students and how to provide the best education he could provide. He was a friendly and courteous individual who I have been proud to count as a friend and co-worker."

Jake Weaver, a '00 grad, attested to Andrawis' commitment to students.

"Dr. Andrawis was one of my favorite professors during my time at South Dakota State. He challenged me to excel, and he helped instill self-confidence through his belief in me as a student. He was not only my teacher, but also a mentor who showed faith in a young kid by making him a lab TA (teacher's assistant). I count myself lucky to have been his student."

Matthew Rust, a staff controls engineer at Raven Industries in Sioux Falls and a 2004 electrical engineering graduate, wrote, "Alfred was a teacher of mine when I was an undergraduate and graduate student at SDSU. He was such a caring teacher and encouraged students in a manner I think about almost every day at work.

"He would always say 'I don't care what grade you get in my class, I care that you learn the material. I will give you all a passing grade if you are learning.' This is an important skill because learning isn't something you do just while you are in school. Becoming a lifelong learner is necessary and will ensure that you always succeed."

### Arrived at State in 1979

Andrawis' connection to SDSU began in 1979 when he arrived in Brookings from Khartoum, Sudan, with his bride, Madeleine, whom he married Feb. 26, 1978. Andrawis, who was working in the Department of Telecommunications in Sudan, came to the U.S. to pursue a master's in electrical engineering.

Andrawis was born July 9, 1947, in Khartoum and received his secondary education there. He earned his bachelor's

degree in electrical engineering from the University of Alexandria in Egypt.

While studying at State, he also was a maintenance engineer at KESD radio station in Brookings and in 1981-82 a graduate assistant in electrical engineering.

Andrawis received his master's degree in 1982 and was offered a full-time position in the department.

In 1987, the family moved to Blacksburg, Virginia, where he worked on his doctorate from Virginia Tech. He received his doctorate in electrical engineering in December 1991 and returned to SDSU in 1992, accepting an assistant professor position. He worked his way through the ranks to full professor in 2000.

### Summers spent on NASA research

Between 1994 and 2003, Andrawis received a NASA Summer Fellowship eight times to do research on fiber-optic sensors and lasers at the NASA Kennedy Space Center in Florida and NASA Goddard Space Flight Center in Maryland. His main accomplishments included designing a fiber-optic sensor for detecting dangerous leaks on space shuttles.

Six of those years he received a NASA-related grant to allow one of his SDSU students to serve with him.

Another of Andrawis' hallmarks was establishing a teaching/research Fiber Optics Laboratory at SDSU in 1997. "He ordered everything from the ground up. Windows were blocked off, and walls were painted black so the light wouldn't reflect off the wall. Tables were air suspended so they wouldn't shake at all," said Madeleine, who also taught electrical engineering at State.

The lab was started in the basement of Harding Hall and then moved to Daktronics Engineering Hall when the first wing opened in 2009.

He served as a National Science Foundation panelist to review grant and fellowship proposals and technical papers from 2002 to 2010 and 2013.

Andrawis was named SDSU Teacher of the Year in electrical engineering in 1987 and received a similar honor from Virginia Tech in 1988.

### 'Egypt, here we come'

Andrawis also planned and led six two-week study abroad trips to Egypt between 2003 and 2010 as part of a general studies course that he taught. Numerous faculty and staff members, students and community leaders

studied and traveled to Egypt under his guidance.

Kim (Drake) Bowers, a 2008 general studies graduate, said, "I had the privilege of being one of the first students that Alfred and Madeleine accompanied to Egypt (in May 2005), and I am a better person for it.

"They were like our parents when we were over there, so protective and always there for us. That really was one of the best trips ever. I am so glad that I got to experience it all with such a wonderful couple. Alfred will be dearly missed by all."

Alfred and Madeleine Andrawis taught the class in addition to their full load of electrical engineering courses. "We used to give lectures about different aspects of the Egyptian history, politics, language, culture and religion. Students would study whatever they were interested in such as hieroglyphics or the structure of the pyramids. They would make a presentation" to classmates before the trip.

"Then they would keep a daily diary (on the trips) that Alfred would read and grade," Madeleine said.

The trips were an offshoot of the student exchange agreement that Alfred initiated with American University in Cairo and formalized March 21, 2003. "That was a great program. Many of our students spent a semester or more in Egypt. They only had to pay SDSU fees, which were much lower than American University," Madeleine said.

### Retirement brings a move

Shortly after retirement, the Andrawises moved to Alexandria, Virginia, in the Washington, D.C., area because all three of their children and a large number of their extended family members lived in the area.

"It was time to come closer to family members. Moving back East was the right thing to do. Alfred was on the board of the church here," Madeleine said of the newly established Saint Abanoub Coptic Orthodox Church in Springfield, Va. She also retired June 21, 2013, after 28 years of teaching in the electrical engineering department.

Alfred's family reports, "He had a happy, healthy and blessed life enjoying traveling, boating, fishing and listening to his music until diagnosed with cancer in March 2016, which he fought and endured courageously until the last breath."

His funeral was Jan. 5 at Saint Mark Coptic Orthodox Church, Fairfax, Va. Burial was at Fairfax Memorial Park.

Survivors include his wife and three children, who are all SDSU graduates: David, of Baltimore, a 2007 master's in computer science grad; Danny, of Washington, D.C., a 2011 electrical engineering grad; and Mary, of Los Angeles, a 2006 pharmacy grad who is married to John Refila. They have an infant daughter, Sophia.

*Dave Graves*



The Andrawis family, pictured in their Brookings home on the date of Madeleine and Alfred's retirement reception, April 19, 2013, are, from left, David, Danny, Madeleine, Alfred and Mary.

# Alumni Notes

**Fred Brooks '99** civil engineering published the biography "Extraordinary Stories from an Ordinary Man—How Faith and Friendship Triumphed over Adversity" through BookLocker.com in 2016. It is available in hard copy or softback.

**Jeff Cooley '08** civil engineering and Justin Picek '10 construction management are among those recognized by Prairie Business Magazine's 40 Under 40.

They were selected from among 150 nominees for the annual listing by the Grand Forks, North Dakota, publication. Cooley, 32, is the chief executive officer of Civil Design Inc. of Brookings. Picek, 29, is president of Picek Construction of Huron.

The December 2016 issue features 40 of the top business professionals under the age of 40 in the Northern Plains.

Cooley began work at Civil Design in 2008. He became a professional engineer in South Dakota in 2012 and was promoted to a principal within Civil Design in 2014. Cooley recently became the firm's CEO.

Cooley's civic work includes volunteering as a mentor of science, technology, engineering and mathematics students and serving on the advisory council at the Boys & Girls Club of Brookings. He has served on the board of the Young Professionals with the Brookings Area Chamber of Commerce, is a past graduate of Leadership Brookings and has volunteered as a youth coach for multiple sports.

Picek worked for Picek Construction under the guidance of his grandfather and father from a young age. In 2011, he became the third-generation owner of the firm. In 2014, Picek Construction received the Huron Area Family Business of the Year Award. He is part of the Beadle County Search and Rescue dive team and is on the board of Huron Regional Medical Center and the Huron Young Professionals.

**Erik Hanson '10** mechanical engineering has recently authored "The Azrael Initiative," which was self-published earlier this year. The fiction thriller involves two female SDSU senior engineering students who thwart a terror attack in the university cafeteria and end up getting recruited by a secret government program to fight ISIS.

When not working on his second novel, "Storm Raven," Hanson, a Sioux Falls native, works as a software developer for Carsforsale.com in Sioux Falls. The book is available through Amazon with signed copies available by contacting the author: KHansonAuthor@gmail.com.

**Jerome J. Lohr '58** civil engineering, the namesake of the college, received the "American Wine Legend" honor from Wine Enthusiast Magazine at its 17th annual Wine Star Awards in Miami Jan. 30.

He is only the third person to receive the award in the history of the event. Lohr, founder and president of J. Lohr Vineyards & Wines in central California, is recognized for helping to bring the wines of Paso Robles and Monterey County to global prominence.

Since planting his first Monterey County estate vineyards in 1972 and his original Paso Robles vineyards in 1988, Lohr has helped to define quality in Central California Coast viticulture.

At the same time, he has established J. Lohr Vineyards & Wines as one of the most respected and successful multigenerational family-run wineries of its size in the world, with more than 5,000 acres of estate vineyards in Paso Robles, Monterey County and Napa Valley.

On Oct. 4, 2013, the College of Engineering was renamed the Jerome J. Lohr College of Engineering for the impact he has made on the university in general and particularly the college.

**Glenn Meier '78** electrical engineering is featured in a February National Engineer's Week article in FocusFAA, a newsletter of the Federal Aviation Administration.

Meier has worked with the FAA since 1985 supporting the design and deployment of radar systems used for Air Traffic Control. Now he is the team lead in the FAA's latest surveillance implementation, the Automatic Dependent Surveillance—Broadcast system, for the Gulf of Mexico. Meier's team is responsible for installing and maintaining the radios on oil platforms.

"It's not cost-effective to put big radar systems out on oil platforms, but you can afford to install smaller radios on several platforms so air traffic control can see the aircraft and maintain separation," said Meier. "It's a big safety improvement." The

project is ongoing because of the need to move radios from one platform to another as platforms complete their useful life.

**Dave Odens '73/'74** civil engineering retired Oct. 31, 2016, as president of Banner Associates, the Brookings-based engineering firm. He served on the board of directors through the February annual meeting and was honored at a Jan. 19 public reception.

Odens taught in the civil engineering department for two years after earning his master's degree and then began his 40-year career at Banner. He was serving as senior vice president in charge of the water resources division before becoming president in 2013.

The responsibilities of president are being divided by Brad Wermers '89 as president and chief executive officer and Gregg Jorgenson '90/'94 as senior vice president and chief operating officer.

**Craig Ploetz '99** civil engineering was inducted into the North Branch (Minnesota) High School Hall of Fame Jan. 19.

At North Branch he earned 16 varsity letters: four in Future Leaders of America, three in football, three in track and field, three in band and three in Vocational Industrial Clubs of America. Ploetz was all-state in football in 1994, earned a superior rating in band and was a member of the National Honor Society.

At SDSU, the offensive lineman was a four-year letterman who was second team all-conference his senior year (1998).

He now lives in Hermantown, Minn., and works at Northland Constructors.



Jerome J. Lohr, namesake of the college, received the American Wine Legend award from Wine Enthusiast Magazine at its 17th annual Wine Star Awards in Miami Jan. 30.

# DEAN'S CLUB

Jan. 1, 2016, through March 15, 2017

Dean's club membership consists of alumni and friends who have contributed \$500 or more annually to the Jerome J. Lohr College of Engineering. Dean's Club members are recognized as devoted friends of the college who make a significant impact on the college's future. Member names will be listed in the SDSU Honor Roll and the college newsletters. They also will receive invitations to special college and university functions and updates from the college dean.

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# Jackrabbits are the best donors



Tom Becker  
Development Director  
Jerome J. Lohr College of Engineering  
SDSU Foundation  
(605) 695-9250  
Tom.Becker@SDStateFoundation.org

A question I have often heard over the past few months is, “How do you like your job at the SDSU Foundation?” It comes from friends, neighbors and colleagues aware that I joined the Foundation after 22 years at Daktronics.

It has been almost two years since I began to lead fundraising activities for the Jerome J. Lohr College of Engineering. For starters, being part of the SDSU Foundation team makes me proud to be a Jackrabbit.

As a development director, I have met with graduates of every decade from the 1940s to 2000s. They all possess great pride in being an SDSU engineer. Their accomplishments range from inventions to founding companies to designing buildings and constructing our infrastructure. Our engineers are fighter pilots, railroad engineers, power system engineers, automotive designers and more.

From very early in our history, SDSU engineers have helped to build our campus and many of the structures and programs that make it great. I was reminded of this recently in the Foundation’s Campanile Conference Room, which tells the story of how Charles Coughlin (EE 1909) agreed to pay for constructing the campanile. Coughlin set a wonderful example for thousands of engineering alumni who have continued to build and rebuild our university in the years since the campanile was completed in 1929.

Our alumni have helped to create programs, erect buildings, fund scholarships, endow professorships and provide funds to enrich the educational experience of current and future students. Today, our alumni are stepping up through gifts to the engineering phonathon, gifts to renovate several areas of Crothers Engineering Hall, to create an endowed professorship named for Duane Sander, a retired dean of the college, and other efforts.

It did not take long for me to realize that my role regularly gave me the opportunity to be around Jackrabbits who had three common traits. First, they are enthusiastic supporters of SDSU. Second, they have used their engineering degree from SDSU to create successful careers. Third, they are generous in their support of SDSU. That powerful combination makes my job more fun than work.

So how do I answer the question about my job? I tell them, “I love what I do!” Thanks for all you do.

Tom Becker '81

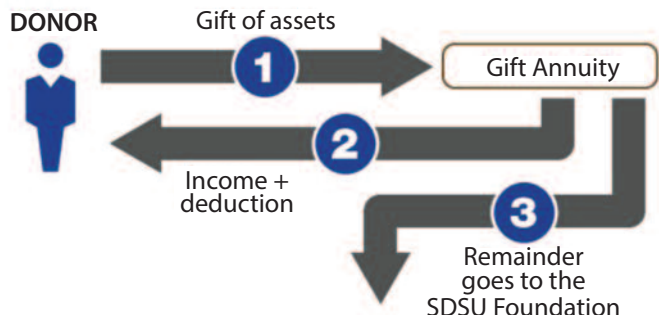
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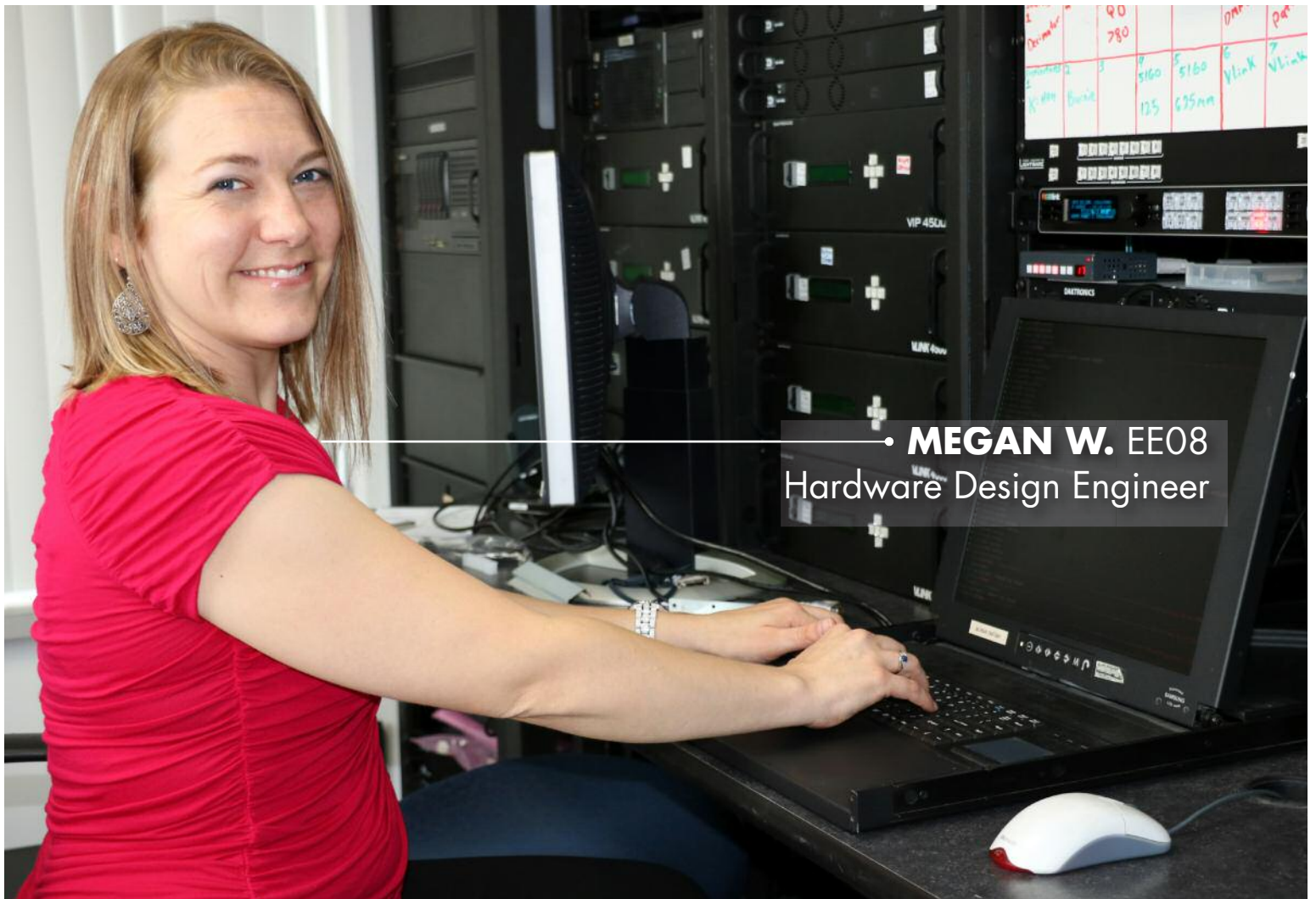
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67	4.8	\$3,558	75	5.8	\$4,426	83	7.4	\$5,298
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69	5.0	\$3,778	77	6.2	\$4,588	85	7.8	\$5,582
70	5.1	\$3,901	78	6.4	\$4,685	86	8.0	\$5,729
71	5.3	\$3,917	79	6.6	\$4,792	87	8.2	\$5,878
72	5.4	\$4,060	80	6.8	\$4,908	88	8.4	\$6,028
73	5.5	\$4,209	81	7.0	\$5,302	89	8.7	\$6,133
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• **MEGAN W. EE08**  
Hardware Design Engineer



## I LOVE WHAT I DO.

I'm glad I chose the Electrical Engineering degree from SDSU. I was nervous going into the field because of the required course load, but I'm happy with my career choice. I love my job and I'm **excited to go to work** in the mornings because I get to design the equipment that controls a majority of college and professional sporting venues.



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# GEMS

The annual GEMSE (Girls, Engineering, Mathematics and Science) youth camp was held in March. In addition to more than 25 parents and teachers in attendance, 91 students participated.

