

# CIVIL MATTERS

CIVIL ENGINEERING NEWSLETTER

SUMMER 2016

COLLEGE OF ENGINEERING



**STRUCTURAL  
ENGINEERING  
RESEARCH  
LABORATORY**

**KANSAS STATE**  
UNIVERSITY



# CIVIL MATTERS

IN THIS ISSUE

EDUCATION

COLLABORATION

LEADERSHIP

EXCELLENCE

1

2

3

3

4

6

7

8

9

9

10

10

10

11

11

12

15

15

16

19

20

20

20

Message from the department head

CE welcomes new faculty members

CE senior awarded national fellowship

Graduate student scholarships

Faculty spotlight

Aziz partners with KDOT for crash study

Graduate student develops BRIDGES software

Damaged girder ends investigated

CE graduate student awarded second place at geotechnical conference poster competition

ITE chapter activities

ASCE chapter update

Chi Epsilon news

Geo-wall team

Steel bridge team

Concrete canoe team

Faculty recognitions and awards

Perić conducts research in Australia

Cooper death

Structural engineering research laboratories

2016-17 scholarships and awards

Advisory council

Distance education courses

Educational objectives

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## FROM THE DEPARTMENT HEAD

In this issue of Civil Matters, we present a summary of the department’s activities and accomplishments over the past year. You will read about our newest faculty members and how they are already making significant contributions to our education and research programs. You will read about the wide range of research projects being conducted by our faculty and their student collaborators. We are proud to showcase our students who have been awarded scholarships and national fellowships to assist them in their studies here at K-State.

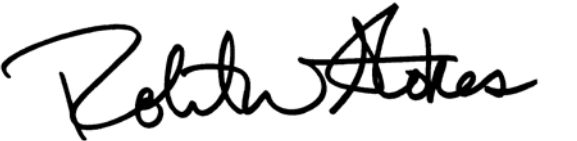
In this issue we are also pleased to recognize our faculty who have received endowments and professorships, as well as national and College of Engineering awards for outstanding research and teaching accomplishments. Note that several of these endowments were made possible by the generosity of civil engineering alumni. The department is truly blessed to have so many loyal and generous supporters. This includes HNTB who sponsor and fund the publication of our alumni magazine, CIVIL MATTERS.

Accomplishments of our students and student organizations and design teams — who have showcased our educational and professional service activities at the state, regional, national and international levels — are also highlighted in this edition. And, we



are very pleased to announce the completion and opening of the department’s state-of-the-art structural engineering laboratories located in Engineering Hall.

I consider it a distinct honor and privilege to serve as your department head, and extend my sincere thanks to all who have supported and encouraged me and the department over the years. The future looks bright for the civil engineering profession and I look forward to continuing to work with you in shaping the future of our department. Our faculty, staff and students extend an open invitation to drop by for a visit. We’d love to chat with you and show you around the department.



Robert W. “Bobb” Stokes  
Department Head and  
Civil Engineering Alumni Professorship Honoring  
Dr. Robert Snell





# CE WELCOMES TWO NEW FACULTY MEMBERS

The department is pleased to announce the addition of two new faculty members to our program. Prathap Parameswaran, environmental engineering, and Eric Fitzsimmons, transportation engineering, joined the department as assistant professors in August 2105. Parameswaran earned a B.Tech degree in chemical engineering from Coimbatore Institute of Technology, India, an M.S. in environmental engineering from the Illinois Institute of Technology and a Ph.D. in environmental engineering from Arizona State University. Fitzsimmons earned a B.S., M.S. and Ph.D., all civil engineering, and all from Iowa State University.



ERIC FITZSIMMONS



PRATHAP PARAMESWARAN

Fitzsimmons' research is in the area of transportation engineering with specializations in highway safety, roadway and intersection operations, and roadway geometric design. His research interests in transportation complement the College of Engineering major emphasis area where multi-disciplinary research in transportation can be accomplished between departments. His research interests have been recognized by his peers through publishing in a breadth of peer-reviewed journals and also membership on the Transportation Research Board, National Academies of Sciences, standing committees on access management, traffic law enforcement and operational effectiveness of geometrics. Fitzsimmons has a track record of obtaining state and federal funds, and also has close

collaboration ties with other research institutions, transportation industry including the railroads and private consulting firms. His research interests and partnerships, along with developing methods and labs to conduct research in the area of transportation engineering, will produce outstanding graduate students and an increase in federal funding which will support the College of Engineering's 2025 vision.

Parameswaran's research is in the area of environmental biotechnology for renewable bioenergy production combined with sustainable wastewater treatment, with a major focus on photosynthetic bioenergy for the production of platform biofuels. His research revolves around the food (waste) – energy – water nexus, an emerging theme of interest for federal funding agencies. Parameswaran's research directly falls under

multiple emphasis areas of the College of Engineering such as biofuels, water and environmental ecology. His approach has already led to collaborations across departments on campus with the department of agronomy on an NSF proposal, and with biological and agricultural engineering on research initiatives with the DoD's ESTCP program. Moreover, Parameswaran has a track record for obtaining federal funds and publishing in high-impact, peer-reviewed journals, both of which will leverage his contribution towards the College of Engineering's 2025 vision to be a top 50 public research engineering college. The multi-disciplinary nature of his research and the depth of his topics will support graduate research culminating in multiple Ph.Ds. over several years, an important 2025 vision statement for K-State's College of Engineering.



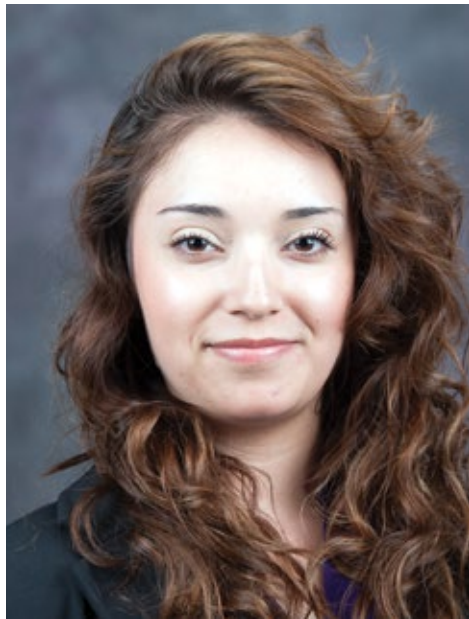
# CIVIL ENGINEERING SENIOR AWARDED NATIONAL FELLOWSHIP

Yadira Porras, Kansas State University senior in civil engineering, has been awarded the American Concrete Institute Richard N. White Fellowship for the 2016-2017 academic year. The nationally competitive fellowship goes to a student enrolled in a master's degree program with an interest in materials study.

The Foundation Fellowships are offered to high-potential undergraduate and graduate students whose studies relate to concrete and who have been nominated by a faculty member who also

is a member of the American Concrete Institute. Along with a \$7,000 educational stipend, the award includes paid travel expenses and attendance for two institute conventions, and assistance in finding an industry mentor — and if the student chooses — assistance in finding a summer internship.

Porras' nominating faculty member is Kyle Riding, associate professor of civil engineering at K-State, who will also be her adviser when she begins graduate studies in fall 2016.



YADIRA PORRAS

# GRADUATE STUDENT SCHOLARSHIPS



Yu-Szu Chen, CE Ph.D. student, above left, and Lisa Shofstall, CE M.S. student, above right, each were awarded a John A. Angold Graduate Engineering Scholarship for the 2016 – 2017 academic year. The scholarship was established by Art Grix Jr. and Linda



Angold Grix of Gold River, California, in memory of John A. Angold, (EE 1938), who'd had a career of almost 42 years at the Atchison, Topeka and Santa Fe Railway. Both are seen with Darren Dawson, dean of the College of Engineering at K-State





# SUSTAINABILITY, TEAMWORK, LIFELONG LEARNING —

## GUIDING PRINCIPLES FOR CIVIL ENGINEERING PROFESSOR

By Mary Rankin

Engineering is changing quickly. The problems are not the same as those solved 20 years ago. As the field and its challenges expand, work will need to be done in teams and as communities to meet the needs of an evolving world.

These are some of the basic beliefs guiding Stacey Kulesza, assistant professor of civil engineering, who early in her career at Kansas State University is making a mark through her research, approach to teaching and campus involvement.

"Through my research, I look at the integrity of our deteriorating infrastructure and how our soils are responding to the changing environment," Kulesza said. "Because I believe our environment is changing, I think we have to look at the big picture and consider sustainability — how to construct things differently and ensure we can continue to use what we already have."

With current KDOT-funded projects involving soil erosion and transportation infrastructure, Kulesza's research focus is nondestructive testing and monitoring of deteriorating infrastructure, soil erosion potential, near-surface geophysics, unknown bridge foundations, levee construction and evaluation, foundation

engineering, and testing both on location and in the lab.

"Right now in this country, we have no knowledge of the foundation depth of nearly 60,000 of our bridges. Researchers have developed various nondestructive methods to get this information, but not knowing is a big problem when we monitor bridges for scour and soil erosion," she said.

"Annually we have levees breaching across the Midwest and flooding out communities. Across the state of Kansas, we have small drainage structures that are corroding and need to be replaced. With no money to rip our infrastructure out and rebuild, we need to evaluate how they are performing and we have to sustain them."

In order to work with a broad and diverse research group, Kulesza likes to recruit undergraduates for her summer lab work from K-State's LSAMP — Louis Stokes Alliance for Minority Participation, Women in Engineering and Undergraduate Research Experience programs.

Her teaching assignments involve undergraduate soil mechanics, where she uses in-class demonstrations and laboratory experiments to supplement geotechnical theory and fundamentals. She also teaches graduate courses in geotechnical engineering, including two design classes

and one advanced testing class. She currently advises five graduate students and has graduated two in her three years at K-State.

"My main goal is to create students who will have an interest in lifelong learning, teamwork and critical thinking," Kulesza said. "I stress those three things in the classroom."

Joining the College of Engineering in 2013 following completion of her bachelor's, master's and doctoral degrees in civil engineering at Texas A&M University, she thought her students would expect her to teach in a serious manner — more like her image of "experienced" faculty.

"I was only a few years older than some of my students — and I tried to disguise that fact by not being myself in the classroom. I soon learned, if I was having fun, they were having fun, too. And a lot more learning took place," she said.

Chosen as one of the speakers in March for SPOTLIGHT K-State — a celebration of teaching and learning excellence — Kulesza shared her teaching philosophy and techniques with the audience — complete with two-minute Muppet music videos she uses as brief timeouts when covering the "tough stuff" in her classes, finding use of these humorous spots to be good for "refocusing."

"I want my students to feel they've been challenged, they've learned a lot and they've

had fun when they complete my class," she said.

With her own choice of getting into soils during her civil engineering studies, in part, guided by being "a 21-year-old who wanted to be tan and be outdoors," she found concentrating on soils made that happen by interning with companies that allowed her to collect soil samples from behind drilling rigs, run field tests and work in the lab. But her overall path to studying engineering was,

perhaps, more intrinsically guided.

Eighty percent of her family are engineers. Her mother, grandfather and aunt are all civil engineers. Her father is an architectural engineer and her sister an aeronautical engineer.

"When it was time to go to college, it was strongly encouraged, if I wanted to count on parental financial support, that I choose either engineering, law or medicine for my studies," she said.

In October 2014, she married civil engineer and fellow Texas A&M graduate, Michael Kulesza, who is employed at a local engineering firm in Manhattan.

Both from San Antonio, the couple has had to adjust from living in a large city to the quieter small town atmosphere.

"But our friends are envious of our short commute time to and from work," Kulesza said, "and that I even ride my bike to campus in nice weather."



STACEY KULESZA





# AZIZ PARTNERS WITH KDOT FOR CRASH STUDIES



A Kansas State University researcher is partnering with the Kansas Department of Transportation, or KDOT, to develop a state-specific crash prediction model for rural multilane highways. “Saving even a single life would be important for Kansas as well as for the United States,” said Syeda Rubaiyat Aziz, doctoral candidate in civil engineering, Bangladesh.

For her research, Aziz started with calibrating the American Association of State Highway and Transportation Officials’ Highway Safety Manual methodology.

She is using Google Maps and KDOT video logs to examine each roadway segment and intersection for obtaining number of crashes and a variety of other factors, including the presence of lighting posts, driveway density and roadside hazard rating. The roadway geometric data were provided by KDOT, which is funding the research project.

Additionally, Aziz has developed a new Kansas-specific crash prediction tool. Her research indicates that this model performs better than existing High Safety Manual in predicting crashes in Kansas.

Aziz categorizes crashes into three severity levels: fatal crashes, injury crashes

and property damage-only crashes. She further divides injury crashes into three subcategories: incapacitating, non-incapacitating and possible injuries.

Aziz foresees a two-step use for her research results. First, her findings are useful in identifying the most hazardous or unsafe segments and intersections of rural roadways. Then, the conclusions can direct in finding suitable countermeasures and thereby prioritizing requests within the state’s transportation budget.

Aziz’s faculty mentor, Sunanda Dissanayake, professor of civil engineering, said the practicality and applicability of Aziz’s research makes it relevant to a variety of stakeholders, from legislators and planners to anyone who drives on country roads.

“Rural highway safety is a critical issue in Kansas, and the number of fatalities due to motor-vehicle crash involvement is considerable,” Dissanayake said. “Finding ways to save lives will bring enormous benefits at all fronts.”

Aziz plans to complete the KDOT-funded project and obtain her doctoral degree in May. Upon completion, KDOT will use Aziz’s research findings and readjust the model to current data for future projects.

“It is imperative that the model be updated on schedule so that the future crash predictions would be as accurate as possible,” Aziz said. “When you get out on the roads and the conditions are unsafe, you can’t have peace of mind. My research will give the people of Kansas a better quality of life.”



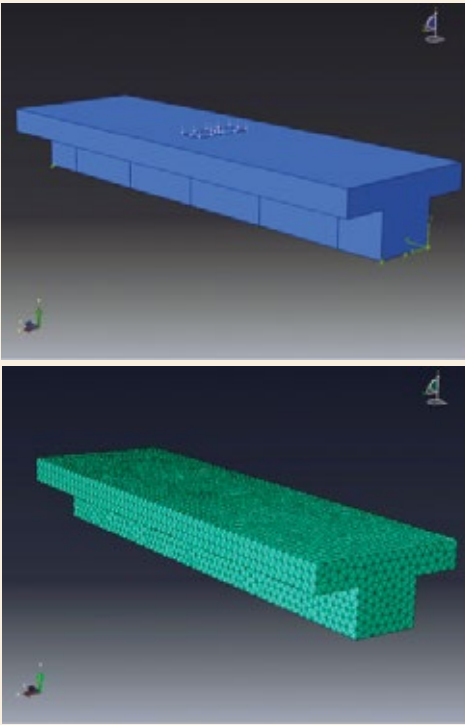
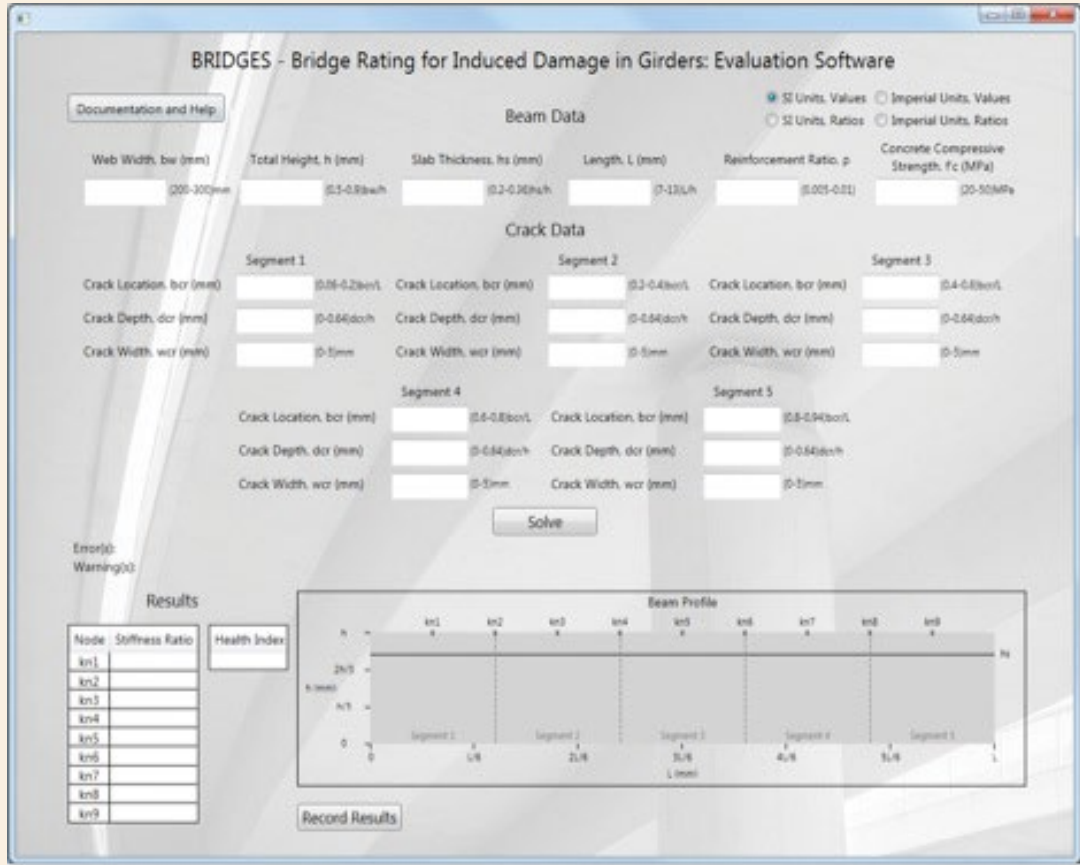
# GRAD STUDENT DEVELOPS BRIDGES SOFTWARE

Eric Fletcher, CE graduate student, has developed a software package named KSU BRIDGES for damage evaluation of simply supported, 3D, reinforced concrete T girders having up to five flexural cracks of different depth, thickness and location along the girder span. The project was funded by Midwest Transportation Center at Iowa State University, which is in turn funded by the FHWA. The program was developed under the supervision of Professor Hayder Rasheed. Jacob Najjar of the University of Mississippi served as a neural networks consultant for the project.

The software utilizes a database of 42,392 healthy and cracked girder simulations generated by 3D, finite-element analysis using ABAQUS. The vast database was generated, run and controlled by an automatic Python Code that creates the input files, runs the simulation and extracts the needed results from the output files. Once the datasets are established, an artificial neural network model is trained, validated and tested to yield a computational engine that captures the data and interpolates between them through pattern recognition.



ABOVE: ERIC FLETCHER  
LEFT: SOFTWARE INTERFACE SCREEN  
BELOW: DAMAGED BRIDGE GIRDER AND MESH







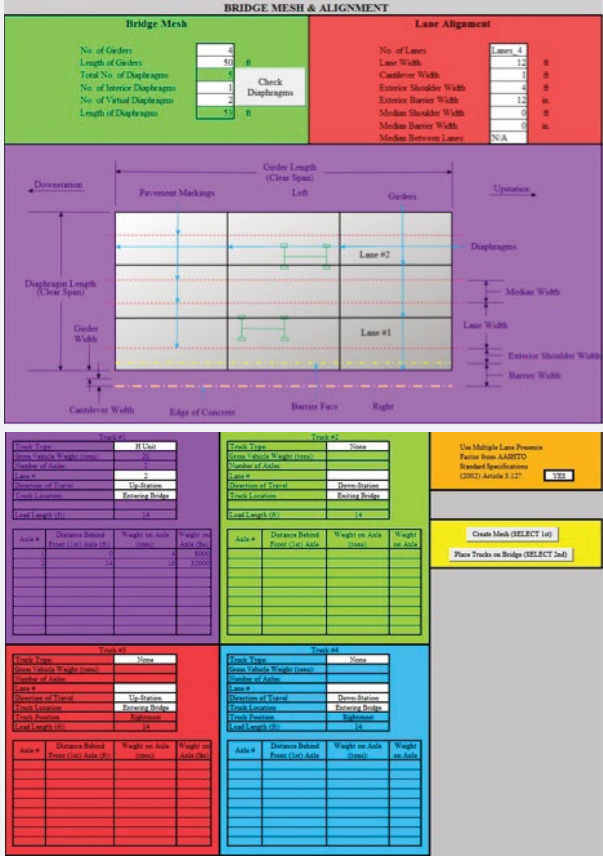
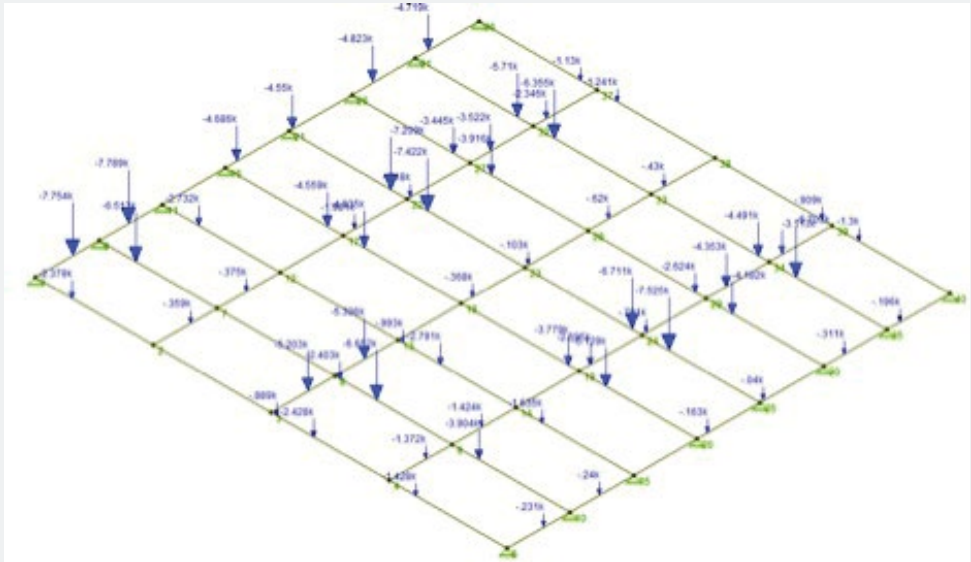
# DAMAGED GIRDER ENDS INVESTIGATED



Andrew Bernica, CE graduate student, has developed the software package KSU Rating of Inclined Damage at Girder Ends, or BRIDGE, for load rating of simply supported reinforced concrete bridge spans having inclined shear cracks at the supports in the reverse orientation. The project was funded by Kansas Department of Transportation’s KTRAN program. John Culbertson, KDOT Bureau of Structural and Geotechnical Services, acted as the project monitor. The program was developed under the supervision of Professor Hayder Rasheed.

KSU BRIDGE is capable of analyzing any bridge span composed of any number of girders and diaphragms supporting two, three or four lanes of traffic under the effect of all truck models used by KDOT to load rate bridges. The rating factor uses a formula that depends on the likelihood of the reverse shear crack to resist shear and keep the bridge operational. The program is used to analyze a damaged bridge on the KDOT inventory showing that the rating factor for operating level slightly exceeds 1.0, while the rating factor for inventory level is less than 1.0, indicating that the bridge is not required to be posted unless demanded by engineering judgement according to the Kansas Bridge Manual.

ABOVE: ANDREW BERNICA  
BELOW LEFT: ANALYZED KDOT BRIDGE  
BELOW RIGHT: INPUT INTERFACE



# News from around the department

## CE GRADUATE STUDENT AWARDED SECOND PLACE AT GEOTECHNICAL CONFERENCE POSTER COMPETITION



Md Zahidul Karim, M.S. student in civil engineering, and Professor Stacey Kulesza have been working with the Kansas Department of Transportation to develop a rapid, nondestructive method for assessing soil erosion potential at scour critical bridges across campus. Karim has presented their research at several regional conferences and was awarded second place at the 2016 Kansas City Geotechnical Conference poster competition. Karim and Kulesza will finish the project in 2016 and are working to disseminate their research findings at the national level.

# ITE CHAPTER ACTIVITIES



The Institute of Transportation Engineers (ITE) student chapter promotes the advancement of transportation and traffic engineering by fostering the close association of students with the transportation and traffic engineering profession and the institute. Main motives of this chapter are to expose students to exciting applications of transportation/traffic engineering, create connections between students and professional engineers, and also enable professional development of members.

In summer 2015, four members of the ITE KSU student chapter — Ishani Dias, Syeda Rubaiyat Aziz, Himanshu Patel and Masoumeh Tavakol — traveled to Branson, Missouri, for the Midwestern ITE District Annual Meeting. They presented their research poster in the student poster competition and Tavakol won the best poster award at the competition for her entry “Analysis of pedestrian crash risk factors of injuries and fatalities in Kansas.” She received a \$400 prize.

In fall 2015, a group of student members visited the city of Manhattan traffic control center. Bill Dickinson, city traffic superintendent, gave a presentation on how

the center operates the traffic system in Manhattan. Afterwards, chapter members had an opportunity to see state-of-the-art equipment and facilities at the center.

Also in fall 2015, the chapter welcomed speakers. Stephanie Watts, transportation planner for the Flint Hills Metropolitan Planning Organization, spoke on existing and upcoming transportation plans of Flint Hills area. Jennifer Russell, lead system engineer of Parsons Brinckerhoff, discussed the largest railway infrastructure project in the U.S., the California High-Speed Rail System.

In spring 2016, the student chapter invited three guest speakers to talk about their accomplished projects. Scott Uhl, vice president and senior project manager for Bartlett & West, and Jim Tobaben, P.E., planning and engineering manager for WSP | Parsons Brinckerhoff, spoke about a crucial highway and bridge improvement project — the I-70 Polk-Quincy Viaduct Design Project in Topeka. Burt Morey, the city engineer of Overland Park, presented on KDOT’s first design-build and largest project ever — the Johnson County Gateway design-build project.

Faculty adviser is Eric Fitzsimmons.



ASCE CHAPTER UPDATE

The 2015-2016 school year was another exciting and engaging year for K-State's ASCE student chapter. The group welcomed Professor Robert Stokes, who joins Professor Asad Esmaeily, as a new chapter adviser. Both have been very active in the chapter by coming to officer meetings and assemblies, answering students' questions and providing leadership guidance to the officers.

The chapter was well represented at ASCE's 2016 multi-regional leadership conference. Six student chapter leaders made the trip to Chicago to attend this conference. Part of the conference

included the Workshop for Student Chapter Leadership where participants had the opportunity to network with other chapters and professionals, sharing ideas on how to make the most out of their ASCE chapters.

The chapter also hosted many social and developmental events for its members. K-State civil engineering students enjoyed each other's company at the spring and fall picnics, toured both the new engineering building expansion and Wefald Hall while they were still under construction, and helped make a difference in the community by volunteering at Manhattan's Wonder Workshop.



ASCE FALL PICNIC

CHI EPSILON NEWS

K-State's Chi Epsilon Civil Engineering Honor Society inducted five new members this past school year. During the fall, new initiates included Jack Olsson, Chad Olney, Casey Keller and Matthew Peterson. The following semester, Laura Neilsen was initiated. The chapter held two service projects, one at Tuttle Creek State Park and one at Sunset Cemetery. At both locations, chapter members

and new initiates worked to pick up sticks and clear walking paths.

The society's new president, Jack Olsson, along with chapter officers Chad Olney, Mary Madden, Laura Neilsen, Lauren Erickson and Megan Ball, and faculty adviser, Professor Hani Melhem, hope to increase name recognition of the organization and create more outreach opportunities to help mentor underclassmen in civil engineering.



The K-State Geo-Wall Team designs and builds a mechanically stabilized earth, or MSE, wall using poster paper and brown wrapping paper. Striving to build the strongest MSE wall using the least amount of reinforcing paper, each team had to present a wooden box with a base, four vertical sides and no top.

The front panel and part of the two side panels are removed for the competition to expose the paper face of the MSE wall, which needs to retain approximately 227 kg of sand with an additional 27 kg vertical surcharge load centered 2.54 cm behind the paper wall face. The team has competed at the regional conference the past three years, with a goal to win the regional competition, and qualify and compete in the national Geo-Institute competition.

Faculty adviser is Stacey Kulesza.



The K-State Steel Bridge Team competes in the Student Steel Bridge Competition — the premiere inter-collegiate steel bridge event where civil engineering students design, fabricate and construct a steel bridge. After construction, the bridge is tested at a regional competition by applying a given load. If the bridge performs well enough, it will be tested again at the national competition. The competition is sponsored by the American Institute of Steel Construction, or AISC, and the American Society of Civil Engineers, or ASCE.

Every year students on the steel bridge team construct a 1/10th-scale steel bridge. The entire project is managed by students who do not receive any school class credit or scholarships in return; however, a great deal of knowledge and experience is gained by everyone involved.

The team is comprised of determined and eager students who want to become involved in a competitive design-build project. From concept to competition, all tasks are performed by members of the team, including designing, optimizing, drawing, detailing, locating and ordering material, fabricating, painting, assembling and competing.

The team goes on to compete first at a regional competition by applying a given load, and if the bridge performs well enough, it will be tested again at the national Student Steel Bridge Competition sponsored by the American Institute of Steel Construction and the American Society of Civil Engineers.

Faculty adviser is Hayder Rasheed.

Steel bridge captains:  
Austin Jueneman  
Ben Nye



Creating a canoe that can float is only half the battle. The other half involves designing, fabricating, building and racing a canoe that is fast, agile and maneuverable — and doing it all with concrete. This is the challenge of the CE concrete canoe team.

Team members meet twice weekly during the school year to refine the concrete mix design and work on structural analysis/hull design. Next comes construction of the mold, with the goal of finishing the mix design in the fall in order to have "pour day" at the beginning of the spring semester.

Maintaining this schedule allows ample time to sand and stain the canoe, and to have paddle practices.

The main goals for the team, while striving to qualify for the National Concrete Canoe Competition, are to maintain membership, increase technical learning, improve aesthetics and improve paddling skills.

Faculty adviser is Asad Esmaeily.

Concrete canoe team chairs:  
Project manager/captain  
Mary Madden  
Vice president/co-captain  
Darren Mayer  
Treasurer  
Tyler Warren





# FACULTY RECOGNITIONS AND AWARDS

## STEWARD HONORED WITH OUTSTANDING FACULTY MEMBER ENDOWMENT

David Steward, professor of civil engineering, has been appointed the Thomas and Connie Paulson Civil Engineering Outstanding Faculty Member.



The endowment was established to provide honor to Thomas and Connie Paulson on the campus at Kansas State University, and to recruit and retain the highest quality faculty in the College of Engineering.

Steward has been the lead or co-principal investigator on more than \$13 million in research projects at K-State with funding agencies such as the National Science Foundation and U.S. Department of Agriculture, as well as international collaborations. His areas of research interest include interdisciplinary water resources modeling, ground water flow, mathematical and computational studies founded in the analytic element method, and providing engineering support for society to address water resources sustainability challenges.

He joined the civil engineering faculty at K-State in 1998 as an assistant professor, attaining the title of full professor in 2010. He holds bachelor's, master's and doctoral degrees in civil engineering, and a master's degree in mathematics, all from the University of Minnesota.

A recipient of the College of Engineering Frankenhoff Research Excellence Award in 2014, Steward is also a licensed professional geoscientist in the state of Texas.

## MELHEM HONORED WITH TEACHING SCHOLAR ENDOWMENT

Hani Melhem, professor of civil engineering, has been appointed the Darold and Debbie Davis Cornerstone Teaching Scholar in Civil Engineering. The purpose of this award is to honor Darold and Debbie Davis and to promote teaching excellence in the department of civil engineering.



With a specialty in structural engineering, his research focuses on artificial intelligence and information systems, computer-controlled testing, experimental analysis and fatigue and fracture of structures, and finite element and numerical modeling of structures with a goal to enhance and preserve the nation's infrastructure.

Melhem holds a bachelor's degree from Cairo University, and master's and doctoral degrees from the University of Pittsburgh, all in civil engineering.

He is a fellow of the American Society of Civil Engineers, having served as president of the Kansas section of the organization. He has been recognized by the College of Engineering with both the Larry and Laurel Erickson Public Service Award, and the Charles S. Scholer Faculty Award.

## STOKES AWARDED ALUMNI PROFESSORSHIP

Robert Stokes, professor and department head of civil engineering, is the recipient of the Civil Engineering Alumni Professorship Honoring Dr. Robert Snell. The endowment was



established by Douglas Smith, a 1971 graduate of Kansas State University in civil engineering, and his wife, Cynthia, Longmont, Colorado.

The professorship honors Snell, former professor and department head of civil engineering, as well as promotes recruitment and retention of the highest quality faculty for the department.

Stokes is director of the University Transportation Center and his research

focuses on urban, rural and intercity transportation planning; highway design, planning and operations; traffic engineering; design and operation of turning lanes; traffic safety; and transit planning, design and operations. The work is often conducted in a multijurisdictional context, which requires coordinating efforts and priorities of various city, county and state agencies to develop workable solutions to real world transportation problems. He is the co-director of the Kansas Department of Transportation and National Highway Traffic Safety Administration's Traffic Assistance Services for Kansas, or TASK, group.

His educational background includes a bachelor's degree in engineering from Antioch College, master's degrees in both

civil engineering, and community and regional planning from Ohio State University, and a doctorate degree in urban and regional science from Texas A&M University.

A member of the American Society of Civil Engineers, Stokes has been named a fellow of the organization as well as serving as past director of its Region 7. He also is a member and named fellow of the Institute of Transportation Engineers, and a past recipient of the U.S. Department of Transportation's Dwight David Eisenhower Faculty Fellowship.

## NATIONAL ACADEMY HONORS STARRETT FOR ENGINEERING ETHICS COURSE

Steve Starrett, associate professor of civil engineering, has been notified by the National Academy of Engineering that his course, CE 703 Responsibility of Engineering: Codes & Professionalism, has been recognized as an exemplar course in engineering ethics.



Responsibility in Engineering: Codes & Professionalism focuses on ethical dilemmas engineers may encounter and how to approach related challenges. Starrett said his goal in developing the course more than 15 years ago was to provide a unique graduate-level educational opportunity for engineers seeking to learn more about engineering ethics.

This course, along with other exemplar activities, will be featured on the National Academy of Engineering Online Ethics Center website as well as in an academy report. Starrett attended the American Society of Engineering Educators annual conference in June in New Orleans, where he was recognized for this accomplishment.





## FACULTY RECOGNITIONS AND AWARDS

### HOSSAIN RECOGNIZED FOR CONTRIBUTIONS TO LIGHTWEIGHT AGGREGATE USE



Mustaque Hossain, professor of civil engineering, has been chosen by the directors of the Expanded Shale, Clay and Slate Institute to receive the 2016 Frank

G. Erskine Award for his outstanding contributions to the use of lightweight aggregate.

The award was presented May 11, at a banquet during the institute's mid-year meeting in Boulder, Colorado.

Hossain is the Munger professor of civil engineering at K-State and

associate director of the Mid-America Transportation Center. His research focuses on highway materials, pavement design and performance evaluation, and nondestructive testing of pavements with a goal of advancing and preserving Kansas' and the nation's rural roads and highway infrastructure.

### 2016 CE DEPARTMENT AWARDS

ASCE Outstanding Faculty Award — Hayder Rasheed

ASCE Outstanding Advisor of the Year — Asad Esmaeily

Chi Epsilon Student Advocate of the Year Award — Hani Melhem

Chi Epsilon Undergraduate Teaching Excellence Award — Hayder Rasheed

Chi Epsilon Advisor of the Year — Stacey Kulesza

Outstanding Graduate Faculty Award — Hayder Rasheed

Outstanding M.S. Award — Masoumeh Tavakol

Outstanding PhD Award — Marta Miletic

Outstanding Staff Award — Jayme Reid

Outstanding Colleague Award — Stacey Kulesza

Outstanding University and Professional Service Award — Sunanda Dissanayake

Outstanding Research Award — Robert Peterman

Outstanding Teaching Award — Stacey Kulesza

### FACULTY WIN COLLEGE AWARDS

**Robert Peterman**, CE professor, has been awarded the 2016 Frankenhoff Outstanding Research Award from the College of Engineering in recognition of individual achievement in engineering research at Kansas State University. The award is based upon research accomplishments during the last five years as well as research projects, commitment to graduate education, dissemination of research results and research leadership.

**Hani Melhem**, CE professor, has been awarded the Myers-Alford Memorial Teaching Award in recognition of his outstanding teaching efforts. The recipient must provide outstanding undergraduate and graduate instruction and mentoring; and provide valuable information to colleagues, peers, and practitioners in the field. The award is based on evaluation of teaching effectiveness by colleagues; student evaluations; and success in sharing information to colleagues, peers, and practitioners.

## PERIĆ TO CONDUCT RESEARCH IN AUSTRALIA

**D**unja Perić, CE associate professor, is one of four Kansas State University faculty members to receive an Oz to Oz Fellowship Awards to conduct research in Australia. Each award includes a \$5,000 grant.

She will work with Stephen Foster, professor of civil and environmental engineering at the University of New South Wales. Perić has been with Kansas State University for 15 years, including the last nine years in her current position. Her research focus is improving the resilience, durability and sustainability of geomaterials and geostructures, such as soils, rocks, concrete and asphalt. Recently her research focus has expanded to include computational and experimental modeling

of ultra-high performance, fiber reinforced cementitious composites, which are vitally important for increased resilience, durability and thermal energy of civil infrastructure.

Perić's primary educational focus is geotechnical engineering, but she teaches courses across the civil engineering curriculum, including graduate-level courses emphasizing fundamental theories and computational modeling of various phenomena and processes found in geotechnical engineering. She has received the following awards: a Professional Opportunities for Women in Research and Education grant and another award from the National Science Foundation; an award from the American Association for Advancement of Science; a visiting fellow

title from the University of New South Wales; and the Making a Difference Award from Kansas State University.

Her work has been published in the International Journal of Plasticity, International Journal of Solids and Structures, Engineering Structures, International Journal for Numerical and Analytical Methods in Geomechanics, and the American Society of Civil Engineers' Journal of Geotechnical and Geoenvironmental Engineering, and Journal of Engineering Mechanics, as well as proceedings of internationally renowned conferences and symposia.

### IN MEMORY

**P**eter B. Cooper, CE professor emeritus, died on May 12, 2016, in Manhattan, Kansas.

Cooper was born March 30, 1936 in Manchester, Connecticut, the son of Ralph Griswold Cooper and Dorothy Bruce Cooper. He was raised in Colebrook, Connecticut, where he attended local schools. He earned his Bachelor of Science, Master's of Science and doctoral degrees from Lehigh University in Bethlehem, Pennsylvania, where he began teaching at the university level.



He moved his family to Manhattan in 1966 to join the Kansas State University faculty in the department of civil engineering. Throughout his 33 years of dedicated service at K-State, the College of Engineering and the civil engineering department, Cooper taught scores of classes, advised hundreds of undergraduate and graduate students, and was promoted to professor in 1974. His research primarily focused on the strength and behavior of plate-girders and of steel beams with web openings, and he published a number of papers and book chapters on related topics. He served on numerous department, college and university committees and had been

an active member of the American Society of Civil Engineers and the Kansas Engineering Society. He retired from K-State in 1999.

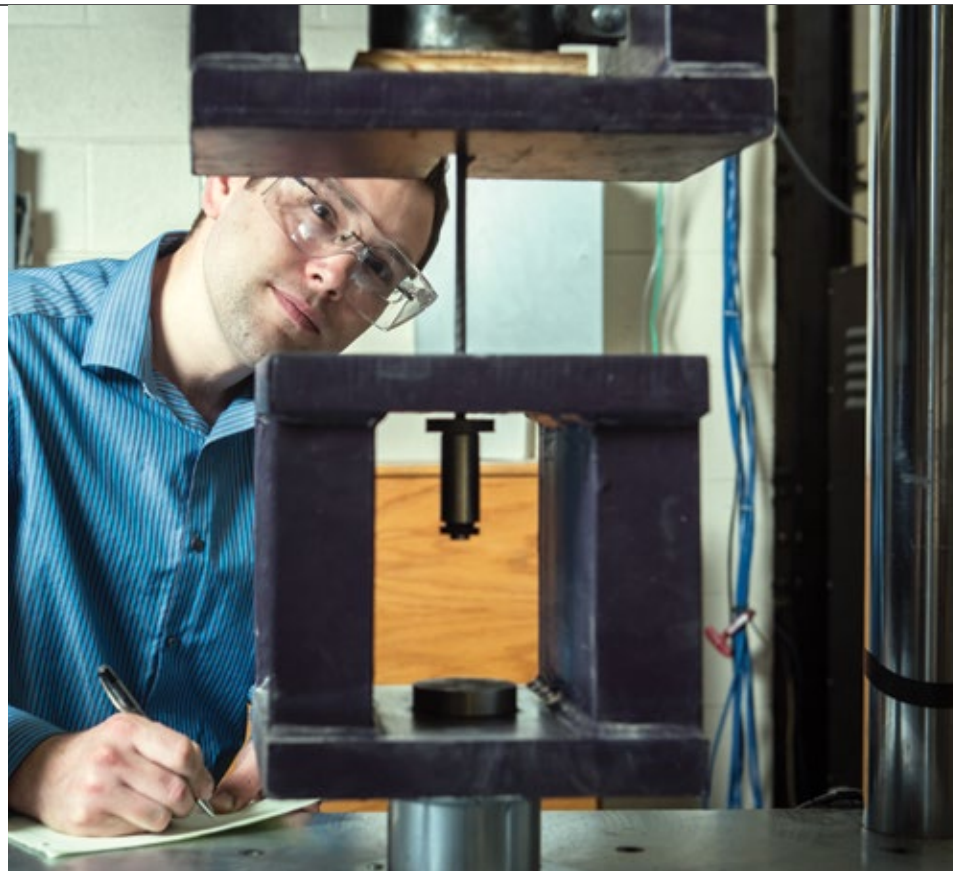
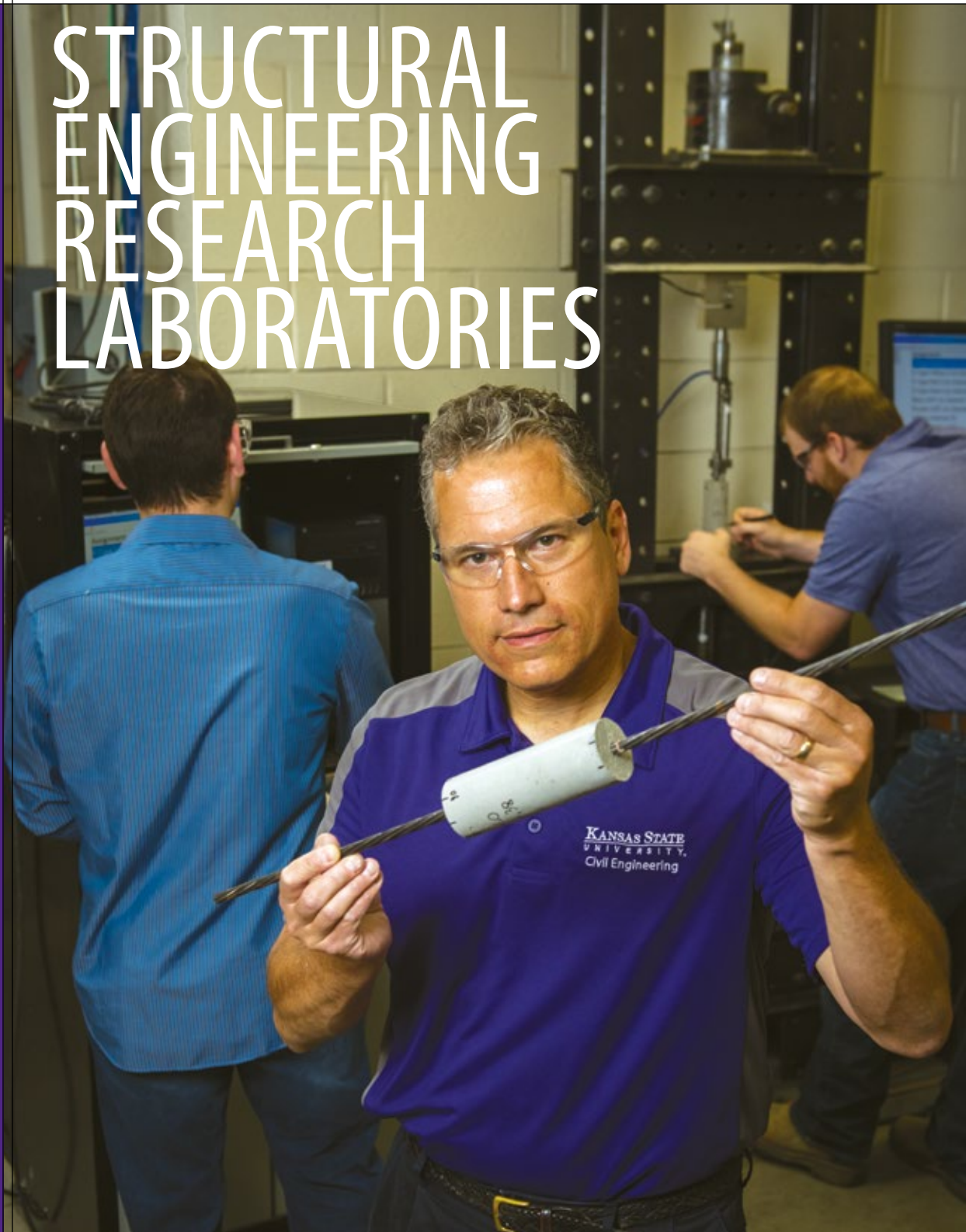
He is survived by his wife, Helen, two daughters and two granddaughters.

The Cooper family asks that donations be given to The Manhattan Public Library, the Little Apple Barbershop Chorus Music Scholarship Fund or the KSU Foundation for the Kansas State Chapter of the Society of Women Engineers. Contributions may be left in care of the Yorgensen-Meloan-Londeen Funeral Home, 1616 Poyntz Avenue, Manhattan, Kansas 66502.





# STRUCTURAL ENGINEERING RESEARCH LABORATORIES



"Setting up for my testing will be two to three times faster due to easier accessibility to the beams, labs and testing equipment."

— James Scott  
CE graduate student

The structural engineering research facilities, under the direction of Robert Peterman, CE professor, are located in the basements of Fiedler Hall and the new Engineering Hall. The lab in Fiedler Hall houses an MTS FlexTest GT Servohydraulic controller; a 30-gpm MTS Silent-Flo hydraulic pump; 10-, 55-, 70- and 250-kip test frames; a 400-kip Baldwin universal testing machine; and three 10-kip Shimadzu AG-IC electromechanical test frames.

The newly completed structures laboratory in Engineering Hall has a 1200-sq.-ft. strong floor with 200-kip tie-downs at three-foot spacing. The lab is supported by a five-ton XYZ crane. Additional equipment housed in or adjacent to this laboratory includes an MTS 60-gpm Silent-Flo hydraulic pump, a four-channel MTS Flextest Servohydraulic controller, an extended-height 110-kip MTS load frame with hydraulic grips and a 250-kip Forney testing machine. The Jerry and Robin Westoff Concrete Mixing and Curing Lab contains a Sure-Cure concrete curing system and a temperature-controlled moist room.

"I really appreciate the open design and work space for equipment in the new lab," said James Scott, CE graduate student. "Setting up for my testing will be two to three times faster due to easier accessibility to the beams, labs and testing equipment. This will lead to getting results faster and having time to pursue other avenues of testing."

Michael Stancic, CE graduate student, added, "The new facility in Engineering Hall is very centralized. Before the new lab was operational, it could take 15 to 18 hours for the curing process, pushing actual testing late into the night."

Location is important to CE graduate student, Robert Schweiger: "The location of the new structures lab right next to the concrete lab is a huge benefit to my research. To have the materials and equipment I need for testing only 10 to 15 yards away, rather than 50 yards away, or a 100-yard round trip whenever I needed something, is a big improvement."

CONTINUED ON PAGE 18







# STRUCTURAL ENGINEERING RESEARCH LABORATORIES

CONTINUED FROM PAGE 17



## 2015-16 scholarship and award recipients

Matthew Anthony — Rex Eberline Civil Engineering Scholarship  
Luke Augustine — Clair A. Mauch Memorial Scholarship in Civil Engineering  
Megan Ball — Loyal and Jill Huddleston Civil Engineering Scholarship  
Swedi Bitendelo — Foundation for Engineering Scholarship, Tointon Family Scholarship  
Samuel Brown — Tointon Family Scholarship  
Christopher Christensen — Alfred Walton Johnson Memorial Scholarship, Orvill “Butch” and Doris Spray Family Civil Engineering Scholarship  
Amy Clark — Coen Family Civil Engineering Scholarship  
Jack Cunningham — Civil Engineering Excellence Scholarship, S.H. Brockway Memorial Scholarship, Tointon Family Scholarship  
William Daniels — Francis D. Wagner Memorial Scholarship  
Mitchell Easley — Loyal and Jill Huddleston Civil Engineering Scholarship  
Lauren Erickson — Alan and Sharon Sylvester Civil Engineering Scholarship, Kenneth and Maria Rector Scholarship in Civil Engineering  
Abraham Fangman — Jim and Pat Guthrie Civil Engineering Scholarship  
Andrew Foerster — Coen Family Civil Engineering Scholarship, Coonrod Memorial Civil Engineering Scholarship  
Claudia Gonzalez — Donald G. Dressler Memorial Scholarship, Foundation for Engineering Scholarship, Tointon Family Scholarship  
Weston Heidzig — Foundation for Engineering Scholarship  
Seth Heronemus — Chas Turnipseed Memorial Fund  
Kara Hinshaw — Kenneth and Maria Rector Scholarship in Civil Engineering, Kevin and Dianne Honomichl Civil Engineering Scholarship  
Brady Hoffman — Clair A. Mauch Memorial Scholarship in Civil Engineering  
Morgan Holmes — Foundation for Engineering Scholarship  
Jerald Hulsing — Foundation for Engineering Scholarship  
Daniel Hutchison — Walter M. and Alice K. Bellairs Scholarship  
Austin Jueneman — Bruce E. Roberts Scholarship  
Julia Keiter — Bruce E. Roberts Scholarship  
Casey Keller — Foundation for Engineering Scholarship  
Isaac Klugh — Jeanne M. and Edward J. Mulcahy Scholarship  
Kristina Ladner — Warren and Mary Lynn Staley Engineering Excellence Scholarship  
Madison Lage — Vicki Scharnhorst Civil Engineering Scholarship  
Alexandra Lee — Beavers Heavy Construction Scholarship, Brungardt Honomichl & Company, PA Civil Engineering Scholarship, Coonrod Memorial Civil Engineering Scholarship, Stuart E. Swartz Civil Engineering Scholarship  
William Lewis — Foundation for Engineering Scholarship, Jeanne M. and Edward J. Mulcahy Scholarship  
Boaz Love — Kenneth and Maria Rector Scholarship in Civil Engineering  
Jacob Lowery — E. William Ulrich Scholarship, Everett J. and Marilyn J. Cupps Civil Engineering Scholarship, ‘Red’ Web Sproul Memorial Scholarship  
Nathan Lubeck — Edmond E. Young Scholarship  
Mark Mathis — Foundation for Engineering Scholarship

Evan McMillan — Charles A. Stryker Memorial Engineering Scholarship, Charles Freund Memorial Scholarship, Kenneth and Maria Rector Scholarship in Civil Engineering  
Darren Meyer — Foundation for Engineering Scholarship, Jim and Pat Guthrie Civil Engineering Scholarship  
Ethan Meyer — Charles Freund Memorial Scholarship, Walter M. and Alice K. Bellairs Scholarship  
Caleb Mitchell — Shelby K. Willis Civil Engineering Scholarship, Tointon Family Scholarship  
Kevin Moluf — Bartlett & West, Inc. Civil Engineering Scholarship, Clair A. Mauch Memorial Scholarship in Civil Engineering, E.C. Lindly Scholarship for Engineering Students  
Blake Moris — Jeanne M. and Edward J. Mulcahy Scholarship  
John Nachtigall — Foundation for Engineering — Dolese Brothers  
Laura Neilson — Bartlett & West, Inc. Civil Engineering Scholarship, Paulson Civil Engineering Student Excellence Award, Stephen and Deloris Berland Civil Engineering Scholarship  
Benjamin Nye — Bruce E. Roberts Scholarship  
Jack Olso — Karl J. Svaty Memorial Engineering Scholarship, Tointon Family Scholarship  
Jacob Paperi — Foundation for Engineering Scholarship  
Yadira Porras — Foundation for Engineering — Dolese Brothers  
Zachary Queen — Clair A. Mauch Memorial Scholarship in Civil Engineering  
Matthew Rowe — Ben A. Sellers Scholarship in Civil Engineering, Tointon Family Scholarship  
Dalton Savage — Forrest Faye and John Warren Frazier Scholarship, Kansas Asphalt Pavement Association, Inc. Civil Engineering Scholarship, R.D. and Mary C. Andersen Scholarship, Tointon Family Scholarship  
Barrett Schmidt — Foundation for Engineering Scholarship  
Colin Shipwright — Foundation for Engineering — Dolese Brothers, Tointon Family Scholarship  
Michael Stancic — Foundation for Engineering Scholarship, Shelby K. Willis Civil Engineering Scholarship  
Brock Swart — Edwin F. and Eunice F. Wambsganss Engineering Scholarship  
Andrew Talkin — Clair A. Mauch Memorial Scholarship in Civil Engineering  
Braden Taylor — Brungardt Honomichl & Company, PA Civil Engineering Scholarship  
Sergio Valenzuela — Foundation for Engineering Scholarship  
William Walker — Chas Turnipseed Memorial Fund, Mick and Nancy McAuliffe Civil Engineering Scholarship  
Elena Watson — Foundation for Engineering Scholarship, Jeanne M. and Edward J. Mulcahy Scholarship  
Seth Weber — Foundation for Engineering — Dolese Brothers  
Alec Weninger — Chas Turnipseed Memorial Fund  
Luke Wetter — Kenneth and Maria Rector Scholarship in Civil Engineering  
Ashton Wherry — Coen Family Civil Engineering Scholarship  
Seaver Williams — Hal and Mary Siegele Scholars Fund, Ray and Pat Wells Engineering Scholarship  
Michael Wood — Alok Bhandari Civil Engineering Scholarship, Donald G. Dressler Memorial Scholarship, Edward L. Wilson Civil Engineering Scholarship  
Jared Yost — Chas Turnipseed Memorial Fund





## CE ADVISORY COUNCIL

The mission of the council is to provide a continuing liaison between the academic community and practicing profession, and to assist the civil engineering department, the College of Engineering and Kansas State University in providing the highest quality of civil engineering education. Functions of the council are to review programs and goals, and advise the department head and dean of the college.

Current members are as follows:

Don Allison '82, '84, retired

Gregg Greenwood '76, retired

Andy Buessing '97, Hutton Construction

Jeff Hancock '98, '00, SMH Consultants PA

Brad Fagan '84, Schwab Eaton PA

Gary Janzen '94, City of Wichita

Catherine M. Patrick '87, Kansas Dept. of Transportation

Scott Uhl '92, Barlett & West

Joe Surmeier '91, Professional Engineering Consultants, PA

Karen Becker '98, City of Manhattan

Jerry Westhoff '74, JJ Westhoff Construction Company

## EDUCATIONAL OBJECTIVES AND STUDENT OUTCOMES

The civil engineering B.S. program at Kansas State University was first accredited by the Accreditation Board for Engineering and Technology (ABET) in 1936, the first year accreditation was given for engineering programs. K-State's CE program has been regularly accredited since then. The last ABET general review was in fall 2011.

### ABET PROGRAM EDUCATIONAL OBJECTIVES

The educational objectives of the civil engineering program at Kansas State University are that most graduates, within three to five years, will —

1. Be successful in their civil engineering careers; and
2. Pursue professional development, advanced degrees and registrations as appropriate for their careers.

### ABET STUDENT OUTCOMES

- (a) an ability to apply knowledge of mathematics, science and engineering;
- (b) an ability to design and conduct experiments, as well as to analyze and interpret data;
- (c) an ability to design a system, component or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability;
- (d) an ability to function on multidisciplinary teams;
- (e) an ability to identify, formulate, and solve engineering problems;
- (f) an understanding of professional and ethical responsibility;
- (g) an ability to communicate effectively;
- (h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and social context;
- (i) a recognition of the need for, and an ability to engage in, life-long learning;
- (j) a knowledge of contemporary issues; and
- (k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.



**KANSAS STATE UNIVERSITY**  
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Department of Civil Engineering

## DISTANCE EDUCATION MASTER'S DEGREE COURSES

The civil engineering department offers graduate-level courses leading to a master of science degree in civil engineering to off-campus students — no matter where they live. All courses needed for the degree will be offered online or by other multimedia delivery methods. At the end of their program, students need to complete an oral examination conducted by their graduate committee. A master's degree can also be counted as a year of credit toward earning a professional engineering license. For information on earning this license, go to the Kansas Board of Technical Professions online at [www.kansas.gov/ksbtp/](http://www.kansas.gov/ksbtp/).

### Fall 2016

- CE 786 Land Development for CE and Planners
- CE732 Advanced Structural Analysis I
- CE 751 Hydraulics of Open Channels
- CE 766 Wastewater Engineering/Biological Processes
- CE 816 Design of Deep Foundations
- CE 828 Advanced Soil Mechanics
- CE 777 Portland Cement Concrete Pavements
- CE 745 Structural Dynamics
- CE 775 Traffic Engineering
- CE 654 Design of Groundwater Flow Systems

### Spring 2017

- CE 833 Advanced Structural Analysis II
- CE 774 Pavement Design
- CE 743 Advanced Reinforced Concrete Theory
- CE 741 Civil Engineering Materials 2
- CE 680 Economics of Design and Construction
- CE 762 Water Treatment Processes
- CE 872 Transportation Safety
- CE 816 ABAQUS Applications in Geosystems
- CE 728 Advanced Geotechnical Design

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"The education received from the department of civil engineering at K-State opened the door to many opportunities. We have been fortunate and believe in giving back to help current and future students. Our giving is further enhanced by matching gifts."

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