

IOWA STATE UNIVERSITY

Department of Civil, Construction, and Environmental Engineering



spring 2015 ccee

student organization newsletter



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cceeweb@iastate.edu.



Dear Reader,

The CCEE Student Organization Newsletter provides the latest on Iowa State University civil engineering and construction engineering students, their activities, and other associated stories. Student leaders provide updates contained in every issue, every semester. Since spring 2012, we have been thrilled to share what students do best — embark on adventures. Hope this inspires your next adventure.

Kind Regards,

IOWA STATE UNIVERSITY
Department of Civil, Construction, and Environmental Engineering

civil construction software club (ccsc)

The Civil Construction Software Club (CCSC) is a student organization that gives CCEE students up to date knowledge about the computer software and technology they'll need to succeed in the industry.

Last fall, the club explored all sorts of exciting programs and technologies. Some highlights from last semester include demonstrations about using Microsoft Word to its fullest extent, a demonstration of Autodesk Revit directly from the local AutoDesk distributor in the area, and a demonstration of Synchro construction software from Assistant Professor Yelda Turkan.

Grant Hagan of the Beck Group also brought a quadcopter for live demonstrations on how drones and similar technology change how projects are constructed. This semester, we hope to continue to explore new software and equip our students to be able to take official Autodesk certifications to put on their résumé and show they have the skills to succeed in the real world.

»To get involved, contact CCSC president Micah Makaiwi at mmakaiwi@iastate.edu.



earthquake engineering research institute (eeri)

Iowa State University's Student Chapter of the Earthquake Engineering Research Institute (EERI) is designed to facilitate networking opportunities and promote activities closely related to seismic engineering.

EERI supports the undergraduate seismic design competition (SDC) team to compete in balsa wood building in the annual national undergraduate SDC. The club also regularly invites guest speakers to talk to students about the field of seismic design, post-earthquake evaluation, and recent advances in this field.

Education outreach opportunities serve to promote interest and learning opportunities for local K-12 students within the field of earthquake engineering. The photo at right was taken at the end of our last outreach activity with the Science Bound Program. In addition, time is also reserved for relaxing and throwing social events. Come join us for the more exciting year to come.

»To get involved contact EERI president Bin Cai at binc@iastate.edu.



associated general contractors of america (agc)



The Associated General Contractors of America (AGC) Student Chapter at Iowa State has some exciting events planned for this semester. In April, AGC has arranged an overnight tour, where members will visit up to three jobsites in the Minneapolis metro area. Later in the semester, AGC will host the annual banquet and golf outing for the construction engineering program. AGC also conducted a Spring Break Service Trip that took place in March. AGC took 40 members to Johnson City, Tenn., to assist in poverty relief efforts. In addition, there are several socials and community service events scheduled throughout the semester.

AGC holds meetings on the first Wednesday of each month and is planning presentations from GC3, Ames Construction, and Clayco.

AGC provides great opportunities for students interested in the construction industry, regardless of experience. It is a dynamic student organization that intertwines friendships, construction education, and industry interaction.

»To get involved, contact AGC president Andy Reynolds at areynold@iastate.edu.

american society of civil engineers (asce)



The American Society of Civil Engineers (ASCE) is a student organization that aims to encourage active interest in the study of civil engineering. The purpose of ASCE is to expose students to a variety of events that will expand their education and career opportunities, as well as create a sense of community within the CCEE department.

Members of ASCE are given many opportunities to become involved with worthwhile activities outside of the classroom. Speaker events give members an opportunity to learn more about different civil engineering companies as well as build professional relationships with the practicing engineers. Alongside these professional relationships, many personal relationships are created and fostered from the social events, such as tailgates and tournaments. The ASCE outreach events are a chance to serve the environment and the people of our surrounding community. There are also many special events offered by ASCE, such as jobsite tours and help sessions.

Technical understandings can be gained from the two different team competition groups – Steel Bridge and Concrete Canoe. The Steel Bridge Team provides students with the opportunity to design and build a scaled-down bridge completely on their own. The Concrete Canoe Team gives students the chance to work together to design, build, and race a canoe made of concrete.

»To get involved, contact ASCE president Brady Lawler at blawler@iastate.edu.

civil ladies

Civil Ladies is a brand new organization at Iowa State University and the CCEE Department as of fall 2014.

The Civil Ladies were created for young women to interact and meet with other women in the civil engineering field.

We offer the chance for women to learn more about females in engineering programs at Iowa State and in the professional world. With this, the Civil Ladies will help prepare women to become more confident with their abilities in engineering through mentorship opportunities by adding opportunities to network with industry to advance career goals of young women entering the field. Lastly, the Civil Ladies will give back to the local community through outreach volunteering events and inspire girls to pursue engineering and science-related career fields.



Throughout the past semesters, the Cabinet members participated in a small luncheon and Q&A with two Iowa State alumni of Boeing. At the beginning of the fall 2014 semester, the Civil Ladies hosted HNTB from Kansas City for a presentation on the services they provide, the opportunities they have for students, and a résumé workshop including one-on-one time to critique résumés individually. For the remainder of the fall semester they hosted a career fair prep night scheduled to assist underclassmen in presenting themselves, elevator speeches, résumés, and confidence-building as well as social nights for classmates to interact and get to know one another. In addition, they hosted WSB & Associates for a presentation and Cabinet member meeting in collaboration with ASCE, AGC, and TSA. They also had the Dean of the College of Engineering speak about her successes and leadership. Lastly, they participated in Society for Women in Engineering's Halloween event for young middle school students to learn more about engineering and Iowa State!

»To get involved, contact Civil Ladies president Rebecca Dailey at rdailey4@iastate.edu.

sigma lambda chi (slc)

Sigma Lambda Chi (SLC) is an international honor society for construction engineering. SLC's fundamental purpose is to provide recognition to outstanding students in the construction curricula. Here at Iowa State, the Rho chapter of SLC is open to students in the top 20 percent of the junior and senior construction engineering class. Upon initiation, new inductees are lifetime members. Over the 2014 year we have welcomed seven new members.

As an honor society, SLC provides services to the community, university, and department. This year we hosted six Hotel Lego events. Children in grades K-12 are introduced to the construction engineering program as well as Iowa State University. SLC enjoys hosting these events to encourage future ISU students to consider engineering, with the construction program as a possible major.

This next year SLC plans to continue with our initiations, service and social events.

»To get involved, contact SLC president Andrew Lemus at aemus@iastate.edu.

water environment federation (wef)



Water Environment Federation (WEF) is a student organization that aims to share knowledge of available water resources, pollution prevention practices and design, and construction and maintenance of water treatment facilities. WEF provides opportunities for out-of-classroom educational and networking opportunities to ISU students.

Last year, we arranged a trip to WEF's Annual Technical Exhibition and Conference (WEFTEC) in Chicago. In the 2014 fall semester we toured the Des Moines Water Reclamation facility, attended the American Water Works Association annual conference in Des Moines, and had five students attend the Grade A water supply operator's certification workshop at Des Moines Area Community College. In

spring 2015, we toured the JBS Swift plant in Marshalltown, Iowa. This was a great opportunity to see an industrial facility and the associated industrial wastewater treatment process. Next year we again plan to attend the WEFTEC conference in Chicago.

»To get involved, contact WEF president Jeremiah McMahon at jmcmahon@iastate.edu.

mechanical contractors association (mca)



This past semester for the ISU Mechanical Contractors Association (MCA) Student Chapter was one for the books. The first few weeks of classes were kicked off by our first monthly meeting, followed closely by the 14th Annual ISU MCA Golf Outing. The outing took place on Sept. 17, 2014, at Tournament Club of Iowa in Polk City with outstanding weather. In attendance were 14 foursomes of mixed industry and student members.

For the second year in a row MCA teamed up with the NECA Student Chapter to host an M.E.P. Career Fair with many local mechanical/electrical contractors and design firms. This event has been a huge success,

helping both student chapters reach nearly 100 percent job placement.

In October 2014, two of our students attended the MCAA Student Summit in New York City, receiving an exclusive tour of Ground Zero and the new Freedom Tower. Additionally, they acquired information for the 2014 MCAA Student Competition Project. This year the project was a design-build proposal for the Segunda Student Services Center at the University of California-Davis.

This semester we had the Spring M.E.P. Career Fair and the MCAA National Convention in Maui, Hawaii.

»To get involved, contact MCA president Justin Block at jablock@iastate.edu.

transportation student association (tsa)

Transportation Student Association (TSA) is a student organization that is open to anyone interested in transportation. This year, TSA has been active in gaining knowledge about the field of transportation engineering through speaker meetings, community engagement and professional conferences.

Last semester, TSA had presentations from Burns and McDonnell, Iowa Department of Transportation (IDOT), Jim Dickinson from the City of West Des Moines, and Kyle Clute from the Office of Design Methods at the IDOT. Dr. Michael Pawlovich presented on work that the Department of Traffic and Safety at the IDOT is doing.

TSA also took two conference trips last semester. Ten students traveled to the Midwest chapter of ITE, MOVITE, meeting in Lincoln, Neb. TSA also went to the 95th Annual TRB Meeting on Jan. 11, 2015, where students went to see the best in research in transportation from around the world.

TSA also participated in the ISU engineering middle school day. We interacted with groups of students from local schools who made paper bridges at our booth. The TSA student club also helped to connect our students with their peers through social events; this year we went bowling and had dinner at Old Chicago.

»To get involved, contact TSA president Bo Wang at bowang@iastate.edu.



national association of home builders (nahb)

This year National Association of Home Builders (NAHB) has seen an increase in active membership. Holding monthly meetings, service and social events have contributed to getting members involved. NAHB and AGC teamed up throughout the fall semester to encourage interaction between the two organizations. The meetings in the fall followed a theme of energy-efficient construction. This all came to a head when members were invited to participate in Alliant Energy's Builder Training at the Gateway Hotel in mid-January 2015. This event was a great experience for students who participated.

This spring, NAHB continues to move forward. A partnership with the City of Ames gives students the opportunity to gain hands-on experience, even in the winter months. The first ever NAHB overnight tour is in the works. In April, the club will head to Eden Prairie, Minn., to tour Pulte Homes' Reeder Ridge development. This will give students an inside look at a large scale homebuilding operation and many homes in different stages of construction. All of these things have contributed to a great year of NAHB.

»To get involved, contact NAHB president Eric Johnson at ejohnson@iastate.edu.



Student News!

For more CCEE news stories, visit www.ccee.iastate.edu.

Iowa State student outreach event teaches kids bridge-building

What do K'Nex, marshmallows, toothpicks, and crawling on tabletops have in common? Why, bridge-building of course.

Several students in the Department of Civil, Construction and Environmental Engineering (CCEE) at Iowa State University led about 25 Story County elementary school students on a bridge-building adventure. One Sunday per month from November 2014 through February 2015, children discovered civil engineering concepts used to build bridges. Three two-hour sessions were held in 130 College of Design building.

“It was cool to see how passionate kids were about engineering,” said Meghan Cronin, an event volunteer and master’s student in civil engineering. “I was very impressed by how much kids that age already knew about bridges.”

Other CCEE volunteers were doctoral student Bin Cai, master’s student Zhao Cheng, master’s student Adam Miller, master’s student Anmol Pakhale, master’s student Andrew Sundal, and civil engineering sophomore Paige Taylor (pictured wearing gold below). Wilson Engineering Professor Sri Sritharan coordinated student participation in the activity.

The first session, held Nov. 9, 2014, gave children the chance to feel real bridge materials. Students, their parents, and event volunteers constructed two four-foot truss bridges using wooden panels, wooden dowels, and steel rods. Once complete, children crawled through the bridges spanning two tables. Afterwards, volunteers taught students compression force, tension force, abutments, decks and columns. Toothpicks and marshmallows were used to demonstrate concepts of transferring forces, including use of the more-stable triangular setup.



Taylor enjoyed this application of engineering, as she worked at a children’s gym while in high school. “In my early years as an Iowa State student, this was a great way to get more involved with the College of Engineering,” she said.

At the Jan. 11, 2015, session, elementary school students divided into groups. Each group produced a team name and logo, much like a new engineering firm would. Children learned about different types of bridges and used what they learned from November to design a bridge concept.

During the last session on Feb. 8, 2015, groups built their bridges using K'Nex. They were restricted to build bridges 12 inches long and with three inches of overhead clearance. Someone on the team kept inventory of bridge components, which taught economic decisions. A small toy car riding over the bridge was used as a strength test.

This event was part of the Elementary Engineering program, which Story County 4-H & Youth hosts and Iowa State University Extension and Outreach sponsors. Children also visited the Iowa State University Ag Farm in September 2014. During the spring they will learn about simple machines, with other science activities, through May 2015. The 2014-2015 cohort is the program’s second year.

CCEE grad student attends weight lifting championship with ISU weight club

Samuel Redd, a civil, construction, and environmental engineering graduate student, attended the 2015 Raw Midwest Powerlifting Championship that was held Jan. 31 and Feb. 1 in Dubuque, Iowa. Redd is the president of the ISU weight club and attended the championship with several other students of the Iowa State weight club.

The ISU students were among 70 weight lifters from across the Midwest who attended the event. The United Powerlifting Association hosted the championship. The meet consisted of three types of lifts: squat, bench press and deadlift. Participants were given three attempts at each of the lifts to allow their potential strength. Lifters were also allowed to wear a belt around their abdomen or wraps around their knees for extra support.

“There are multiple weight classes for the lifters,” Redd said. “So, you can compare your strength with other people who have the same weight as you. Generally, the more you weigh the more you are able to lift. So, it makes for a fair competition.”

For more information about the ISU weight club, please visit its website at www.stuorg.iastate.edu/site/isuwc.

Iowa State wins 2015 TRB Best Paper relating to auto crashes, lane widths

A team of students from the Department of Civil, Construction and Environmental Engineering (CCEE) at Iowa State University recently received a best paper award through the 2015 Transportation Research Board (TRB) Data Contest. The award was presented at the 2015 TRB Annual Meeting, held Jan. 11-15 in Washington, D.C.

The Iowa State team comprised seven transportation engineering graduate students, who worked under the direction of Associate Professor Peter Savolainen. These students included: Timothy Barrette, Georges Bou-Saab, Amrita Goswamy, Raha Hamzeie, Emira Rista, Brendan Russo and Bo Wang. The team received the best paper award for their work in developing a random parameters negative binomial (RPNB) model. This model accommodated several important analytical concerns that are common to police-reported crash data, including temporal and spatial correlation. As compared to 12-foot lanes, the team’s results showed that rear-end and sideswipe crashes increased by 11 percent when lane widths were reduced to 11 feet. More pronounced increases of 22 percent (rear-end collisions) and 41 percent (sideswipe collisions) were observed when lanes were 10 feet wide.

The purpose of this contest, which currently is in its third year, is to provide a platform for researchers, practitioners and students to learn about cutting-edge statistical methods employed in the transportation field.

The objective of the 2015 competition was to develop an exploratory, analytical or statistical model to assess the impacts of narrow lane width on the safety of high-capacity urban roads. Contest participants were provided with 10 years of crash data from nearly 1,000 road segments in the state of Nebraska. The dataset also included information on traffic volumes, speed limits, lane widths, and other geometric characteristics.



Iowa State student receives national design-build leadership award



Iowa State University construction engineering senior Brandon Mai (pictured second from left) was awarded the 2014 Distinguished Design-Build Leadership Award at the Design-Build Conference and Expo, held Oct. 8, 2014, in Dallas, Texas.

The Design-Build Institute of America (DBIA) gave the national award to only three individuals this year: an academic professional, an industry professional, and a student.

To win this award, nominees must have demonstrated leadership in the design-build field. Mai has shown great leadership by being a part of the DBIA Iowa State University Student Chapter for three years and being on cabinet for two years, including his current role as vice president. He has shown much effort in design-build by being a part of the 2014 DBIA Student Competition Midwest-winning team and by attending the 2013 Design-Build Conference and Expo in Las Vegas, Nev. The 2013 conference allowed him to network

with professionals, which landed him an internship in San Diego, Calif., this past summer working on a design-build project. Mai also is the vice president of Mechanical Contractors Association Iowa State University Chapter.

“I am very excited to receive this award. It means a lot to my future,” Mai said. “I am hoping I can continue working on design-build projects and get my DBIA Certification.”

Iowa State teams win, place second in Midwest construction competition

Two teams of Iowa State University construction engineering students placed first in the 22nd Annual Associated Schools of Construction (ASC) Region IV Student Competition, held Oct. 23-25, 2014, in Nebraska City, Neb.

Six-person teams had 18 hours to develop comprehensive proposals for a mock request for proposals (RFP). Teams then gave a 20-minute presentation to a panel of industry judges. The competition was divided into four divisions – commercial, design-build, heavy-highway, and residential – representing real-world engineering challenges in construction industries. Iowa State won the heavy-highway and residential divisions. The commercial team and design-build team placed second in those divisions. Thirty teams representing 14 universities from Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, and South Dakota competed.



Iowa State has placed first in the ASC Region IV competition 39 times since 1994, and it has been at least a runner-up in 49 of 56 ASC competition divisions it has entered.

The residential division’s mock RFP was for Trend Homes, a residential contractor who wants to develop a division in Lincoln, Neb. Students were tasked to develop a feasibility study for a 30-acre, 69-lot residential development. Members of this team were senior Eric Johnson (captain), sophomore Lauren Bennett, junior Dylan Busby, junior Daniel Carlson, junior Tom Devereaux, and senior Kyle Streicher. The residential team has won seven of the last nine years.

Guam-native students typically study civil engineering

Iowa State University not only attracts students from all over the country, but all over the world. With growing programs and opportunities, Iowa State is the top choice for prospective students — especially those interested in civil engineering.

Among those who chose Iowa State as their college, six are from Guam. Of those six, five study civil engineering.

Civil engineering is one of the most commonly studied engineering programs of students from Guam because there are ample civil engineering job opportunities in Guam. Because of increasing military personnel in Guam, new civil engineers are needed to expand infrastructure there. Civil engineering senior Toby Cruz opened up about the job opportunities available in Guam for civil engineers by saying, “Civil engineering offers a variety of sub-disciplines which allows students to explore different work and job opportunities under one umbrella.”



Civil engineering junior Tim Chargualaf said that students who move from Guam to the U.S. for college typically go to the west coast because Guam-native families have established businesses there. Instead of going where most of their classmates went for college, the five Iowa State civil engineering students chose Iowa State because of its high ratings and more specifically, the Department of Civil, Construction and Environmental Engineering (CCEE). Chargualaf said that while he was looking into schools, Iowa State continued to come up for low tuition, low crime rates, and the university’s civil engineering program. The more he researched, the more appealing it became. Once Chargualaf arrived at Iowa State, he was very pleased with the college and the opportunities that were available. “The facilities are great,” Chargualaf said. “We’re getting a really good education here, and you can tell.”

Civil engineering master’s student Grace Mercado spent a lot of time early in her college career not knowing what she wanted to study. She went from architecture, to accounting, and finally landed on civil engineering. Her father inspired her to pursue civil engineering, which she learned to love the more she did it. Mercado said that she is glad she picked Iowa State because of the community and all of the nice people she has met. However, she still isn’t quite used to the cold and snow. “I try to tell myself it’s all in my head,” Mercado said. “But it’s scary when my fingers turn purple.”

Civil engineering junior Rose Manual said that despite being scared to move so far from Guam, she was encouraged to come to Iowa State because of all the great reviews she read online about the civil engineering program. Manual said her favorite thing about the civil engineering program is the faculty. “My professors are very helpful. Whenever I have just one question, they always make time for me and they respond very quickly,” Manual said. She went on to mention how she sees her future: “I’m really thinking I would want to stay in Iowa. I want to work here because the people are so nice.”

CCEE GOLD recent alumni discussion panel

Civil, Construction and Environmental Engineering Graduates of the Last Decade (CCEE GOLD) and CCEE student organizations hosted the first-ever CCEE GOLD Recent Alumni Discussion Panel Jan. 29 in Howe Hall. Students gained first-hand advice of college-to-career transitions, work-life balances, and academic applications to life experiences.



More than 100 students networked with six recent alumni: Andrew “AJ” Barone (BSCE’12) from Raker Rhodes Engineering of Iowa City, Iowa; Nathan Hardisty (BSCE’10) from Shive-Hattery of West Des Moines, Iowa; John Puls (BSCE’07, MSCE’08) from Kiewit Engineering of Omaha, Neb.; Joel Sikkema (MSCE’11, PhDCE’13) from Dordt College of Sioux Center, Iowa; Allison Smyth (BSCE’10) from Iowa Department of Transportation of Ames, Iowa; and Gina Sundermann (BSConE’06) from Ryan Companies US, Inc., of Clive, Iowa.

Panel members represented various sectors of the civil engineering and construction engineering professions, including small engineering firm (Barone at Raker Rhodes Engineering), regional engineering firm (Hardisty at Shive-Hattery), large engineering firm (Puls at Kiewit Engineering), academics (Sikkema at Dordt College), government (Smyth at Iowa Department of Transportation), and construction contractor (Sundermann at Ryan Companies US, Inc.). “We wanted to be prepared to answer any question from any student, regardless of the path they feel strongly about,” Puls said.

Applying undergraduate knowledge to structures research and quality management

As a junior in civil engineering, Lauren Ruchti is making sure she learns as much as she can about the practice of structural engineering to prepare for her career.

Through her experience as an undergraduate research assistant, Ruchti is investigating important topics, like how bridges are rated for agricultural vehicles since the structures are currently only rated for trucks.

During fall semester of her junior year, she researched how to continuously monitor bridge health and stability and how to repair bridge railings.

Ruchti says civil engineering was a natural fit for her, “I have always been interested in buildings and classes related to structures, such as statics and mechanics.” And she knew Iowa State would be the best place to learn more about her interests, “The College of Engineering felt like a really supportive environment and a good place to learn.”

She adds that her engineering classes have served as a foundation for her professional growth. “I have learned a lot of applicable knowledge from getting an education from Iowa State that I can use in my internships and research.”

Ruchti builds her knowledge base through campus activities as well, including the Steel Bridge Team, Undergraduate Student Advisory Council, Tau Beta Pi, and the Rifle and Pistol Club.

In the future, she plans to continue to work on structures, specifically buildings, and pursue a master’s degree.