

IOWA STATE UNIVERSITY

Department of Civil, Construction and Environmental Engineering

Fall 2014

STUDENT ORGANIZATION NEWSLETTER



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New master's of engineering program

Iowa State's interdisciplinary, coursework-only, online master's of engineering in energy systems engineering launches this fall

As the world's population grows, so does a need for sustainable energy sources. With that need comes a demand for knowledge in a variety of energy-related areas and training for professionals working in these areas.

Engineering professors at Iowa State University say a new master's of engineering program will provide that education.

The program in energy systems engineering, which aims to build knowledge, skills, and abilities specific to energy system design, evaluation, construction, and management, is an interdepartmental effort developed to give students and working professionals a chance to move into an emerging field.

"Energy systems engineering involves a lot of new and emerging technologies that are necessary for sustainable energy in the future," said Ted Heindel, director of graduate education for the new program and Bergles Professor of Thermal Science in the Department of Mechanical Engineering. "Our program offers a chance to focus on one energy area while learning about others at the same time, giving students in-depth knowledge and a broad perspective."

The program consists of 10 classes and requires that students take ME 531: Advanced Energy Systems and Analysis and ME 510: Energy Engineering Economics and Policy, along with a math or statistics course and a professional development course.

Electives for the program fall within a variety of energy-related areas including: biorenewables, wind, nuclear, power generation and distribution, building energy and energy efficiency, and thermal science. Students take three courses in a single focus area, and the remaining courses can be selected from a long list of options that cut across engineering disciplines.

"We want to offer flexibility in our program and also give students enough education in a specific area of interest," Heindel said. "A lot of the courses in the electives were already offered to our students, and we've packaged them into an opportunity to earn a master's degree in an important field."

The coursework-only program is available not only on-campus but also through Iowa State's Engineering-LAS Online Learning, making it a convenient and accessible option for working professionals and on-campus students alike.

Students who want to get a taste of what the program is like can earn a graduate certificate in energy systems engineering first, which is a four-course program. "All the courses for the certificate can be applied to the master's degree, making it a great way to see if the program is a good fit," Heindel said. "They can even start taking classes this fall as a non-degree graduate student, assuming they satisfy all the entrance requirements."

Applications are being accepted for students interested in the master's of engineering or graduate certificate program in energy systems engineering. To learn more, check out the admission requirements at www.elo.iastate.edu/master-of-engineering-in-energy-systems-engineering. You can also contact Ted Heindel (theindel@iastate.edu or 515 294-0057) or Engineering-LAS Online Learning (elo@iastate.edu or 800 854-1675 or 515 294-7470).



Master's of engineering in energy systems engineering students.

Students break record

WE HAVE A RECORD: A team of undergraduate students held 102.6 pounds of bricks from a structure made of only seven sheets of newspaper and one yard of masking tape. What an engineering feat! Winning team was Crackers and Beans, featuring Rudolph Garza, Raul Madrigal, Matthew Staley, and John Langa. The activity was part of a team building exercise in the Civil Engineering Keystone Learning Community during the Fall 2014 semester. The previous record was 60.5 pounds, set in 2011.



Cruz: NASA intern, Air Force ROTC cadet, civil engineering student



Civil engineering senior Toby Cruz interned for NASA in summer 2014.

Civil engineering senior Toby Cruz has experienced a notable internship and extracurricular activities while pursuing his bachelor's degree at Iowa State University.

Soon after completing final exams in December 2013, Cruz completed a NASA internship application and gathered faculty recommendations within one weekend. One month later, NASA offered him two internships during summer 2014. He accepted the Rotorcraft Aeromechanics internship, held at NASA's Ames Research Center in Moffett Field, Calif.

Cruz learned that he was one of 50 students, chosen from about 5,000 applicants nationwide, to pursue the NASA internship. He also learned that he was the only civil engineering major in a group of aerospace engineering and mechanical engineering majors. Six Iowa State students were chosen.

The Aeromechanics Branch, within NASA's Aeronautics Office at Ames Research Center, conducts research activities that directly support civil competitiveness of the U.S. helicopter industry and the vertical lift

requirements of the Department of Defense.

NASA tasked Cruz to produce solutions for an aircraft air intrusion problem at Ames Research Center. Problems arose when air blast from NASA airplanes and helicopters intruded from the tarmac to adjacent buildings. Cruz worked with engineers and state-of-the-art software to propose three solutions: 1) plant trees to slow down air blasts between the tarmac and area buildings, 2) build blast walls to deflect air blasts, and 3) reorient aircraft on the tarmac so air blasts would intrude on non-building areas. "It was rewarding to solve practical problems with a NASA research team beyond the textbooks," Cruz said.

Cruz also is a cadet squadron commander at Iowa State's Air Force ROTC. This role has helped Cruz develop strong leadership skills, communication, and professionalism. He said the Air Force ROTC has guided him to aeronautical interests within civil engineering: "I determine the structures of aircraft design, spacecraft design, and composites used within those structures."

Cruz was born and raised in Guam. While he grew up, education and society encouraged students to pursue engineering, particularly civil engineering. In 2012 he moved to Iowa State to pursue a civil engineering degree. "I see my life as an unfinished puzzle. The puzzle is unclear now, but as I collect the right pieces, everything will fit and make sense," Cruz said.

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Geotech student presents asphalt research in Spanish

Ka Lai Ng Puga, an Iowa State University geotechnical engineering doctoral student, recently presented—in Spanish—at the 9th International Conference of Asphalt.

Ng developed a presentation on the modification of asphalt-rubber binders and mixes with polyoctenamer, based on geotechnical engineering research under the direction of Olson Professor Chris Williams. “There is an international push to develop asphalt pavements in Central America and South America, using both conventional and modified asphalt,” Ng said. The Panama native presented to a predominately Spanish-speaking audience at the 9th International Conference of Asphalt, held in Medellin, Colombia, Aug. 5-8, 2014.

Ng’s presentation in Colombia also fit the tropical climate it surrounded. Her research tested polyoctenamer, a synthetic binder additive for asphalt pavement, and ground rubber tire to increase the service temperature threshold of asphalt pavement. The binder additive also proved to reduce asphalt pavement viscosity, allowing less energy to heat and produce the pavement mixture than regular asphalt-rubber binders. “We use green technology by utilizing scrap tires—waste that would normally pile up in stockpiles, landfills and dumps,” Ng said.

Ng grew up with a passion for wanting to build tall buildings. “In Panama, I saw high-rises everywhere—I wanted to build that,” she said. Her first interest was architecture. As she became more interested in the building and design process, Ng learned that civil engineering was her best fit. She went on to earn a civil engineering degree at the Technological University of Panama.

In 2010 Ng used her Fulbright scholarship to pursue civil engineering graduate school at Iowa State—a place she preferred for “personalized attention.” She said she wanted to pursue an area of civil engineering she was not yet familiar with—geotechnical engineering materials.



Ka Lai Ng Puga delivering her presentation in Spanish.

Student organization updates

Sigma Lamda Chi (SLC)



Sigma Lambda Chi members.

The Iowa State University Construction Engineering Honor Society, Sigma Lambda Chi (SLC), welcomed new members last semester and look forward to new initiates this fall. Members are eligible if they are in the top 20 percent of the junior and senior class, or chosen through peer recognition.

SLC is very involved with the community. They promote engineering to K-12 students through student visit days. Their workshop, Hotel Lego, helps young students read plans and build models based on the plans. This fall, the group also plans several job site visits. SLC is a great way to network with professionals and to meet other students in construction engineering.

To get involved, contact SLC president Jacob Schaefer at jakeschaefer@gmail.com.

Freshman construction engineering student pursues golfing

After losing four members from last season's top-25 team, it would be easy to assume that rebuilding team chemistry for the ISU women's golf team would take some time.

Despite the new roster, incoming freshman M.J. Kamin and Nattapan "New" Siritrai are already fitting in like seasoned veterans after a week on campus. Kamin, who is majoring in construction engineering, lacks the international pedigree of Siritrai but could be the best athlete on the team.

Kamin earned letters in basketball, cross country, golf and soccer at Washington High School in Cedar Rapids, Iowa.

"I just decided that [golf] was my favorite thing to do, probably the thing that I was best at and that was something I wanted to spend my summers doing, not playing indoor basketball and not playing soccer," she said.

The three-time all-state competitor initially had her sights on opting for a warmer weather school but decided to remain in her home state to pursue her future in golf as well as construction engineering.

"As time went by, it became evident that this was the right place for me to be," Kamin said. "The facilities were great. I wanted to do engineering and this is a great school for engineering. I met the team and knew that they lost some players but that there was a lot of upside. I just really liked the atmosphere."



Construction engineering freshman M.J. Kamin, Photo by: Korrie Bysted, Iowa State Daily.

This article summarizes a Sept. 4, 2014, Iowa State Daily article written by Mike Randleman, "M.J. Kamin, Nattapan Siritrai fit seamlessly with ISU women's golf."

Transportation Student Association (TSA)



TSA promotes itself at the CCEE Fall 2014 Welcome Picnic on Sept. 9.

The Transportation Student Association (TSA) is a student organization that is open to anyone interested in transportation. TSA holds biweekly meetings that include professional guest speakers, conferences, and social events. This group is designed for students to learn more about transportation, professionalism, and to network with other transportation students and professionals.

Last year, TSA had many great opportunities to learn more about the field including attending professional conferences such as the Midwest ITE Annual Conference, the ITE Annual Meeting and Exhibit, and the 93rd Transportation Research Board Annual Meeting. In September 2014, TSA received the Best Student Chapter Award from the Missouri Valley Section of Institute of Transportation Engineers.

This semester, TSA's plans include presentations from Burns & McDonnell, Schneider Electric, City of West Des Moines, and the Iowa Department of Transportation. The group also hosts social events such as a bowling night and tailgates before ISU football games.

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

Earthquake Engineering Research Institute (EERI)

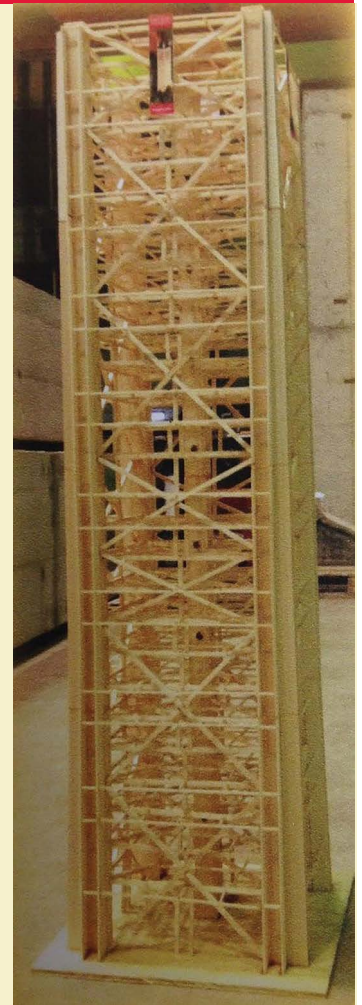
The Iowa State University Student Chapter of the Earthquake Engineering Research Institute (EERI) is a student organization designed to promote activities and research related to earthquake engineering. It is a great way for students to network with other students as well as professionals in engineering. This past summer, six civil engineering students from EERI designed and built a wooden high-rise building model and competed in the 2014 Undergraduate Seismic Design Competition that was held in conjunction with the Tenth U.S. National Conference on Earthquake Engineering in Anchorage, Alaska. The structure was designed to undergo a series of ground motions recorded from real earthquakes. The student chapter also plans to participate in the 2015 competition to be held from March 31 to April 3, 2015, in Boston, Mass.

EERI will be involved in many exciting activities on campus throughout the semester. These activities include hosting seminars from academia and industry, outreach opportunities such as educating local 4-H groups, organizing field trips, and regular monthly meetings.

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



Transportation engineering doctorate student Xiao Lang greets a CCEE student at the CCEE Fall Welcome Picnic on Sept. 9.



Wooden high-rise building model.

Water Environment Federation (WEF)

The Water Environment Federation (WEF) is an international technical and educational organization. The Iowa State University student chapter meets a couple times a month to hold conferences, seminars, and host professionals to speak at these events. It is an environmental engineering organization designed to help students build connections with professionals and is a great learning opportunity for students in water quality related fields.

This semester, WEF is looking forward to attend a tour of the Des Moines Wastewater Reclamation Authority and the Marshalltown Water Pollution Control Plant. The chapter also hosts speaker meetings.

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



WEF promotes itself at the CCEE Fall 2014 Welcome Picnic on Sept. 9.

Associated General Contractors of America

The Associated General Contractors of America (AGC) is a student organization that has some pretty big plans for the school year. The organization has a great lineup of presenters including PCL, Kiewit Underground, and Union Pacific Railroad. AGC also has made plans for special information sessions from Caterpillar and WSB & Associates, area jobsite tours, overnight jobsite tours, and a technology fair with the Civil and Construction Software Club. AGC also has social events including intramural softball, ultimate Frisbee, broomball teams, grill outs, as well as friendly volleyball, football, and softball competitions with ASCE. With all of these fun opportunities, along with monthly meetings and professional opportunities, AGC is a great and fun organization to join.

AGC is also very passionate about community service and giving to others. Each year, the organization sponsors a family for Christmas. Last year, they raised \$400 for a family to buy Christmas gifts. AGC also does various community service projects throughout Ames by helping Mary Greeley Medical Center, Friendship Ark Homes, Volunteer Center of Story County, Story County Conservation, and Central Iowa Habitat for Humanity. AGC also goes on a service trip each year to help those affected by natural disasters. This Thanksgiving break, they plan to go to Colorado for flood damage relief.

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



2014-2015 members of AGC.

Design Build Institute of America (DBIA)

The Iowa State University Design-Build Institute of America Student Chapter (DBIA) is a club dedicated to promoting widespread and successful utilization of the design-build project delivery method in shaping the built environment. DBIA bridges the gap between engineer and designer by having active architecture members interacting with engineers. They hold regular student-run meetings once a month and provide free pizza and beverages for those who attend. Each meeting features a presentation and discussion from a nationally recognized company. This fall, they plan to host social events such as grill outs and Friday After Class Socials. They will also host Bratney Companies, Gilbane Construction, and others to speak about various aspects of the design-build project delivery method.

This year, DBIA plans to go on its annual overnight jobsite tour to a nearby major city. Last year they traveled to Kansas City, Mo., where they toured two different jobsites and visited an architecture office. J.E. Dunn Construction gave a tour of its IKEA store and taught them how professionals used pole planning on the jobsite to coordinate with everyone included on the project. The Opus Group showed off its nearly completed student housing. HNTB Corporation gave students a behind-the-scenes look at its office space and some of its past projects.



2014-2015 members of DBIA at a J.E. Dunn Construction Site.

National Association of Home Builders (NAHB)

The National Association of Home Builders (NAHB) aims to educate members about residential construction and development. The group holds informative meetings where industry professionals come and present important topics in the residential construction industry. NAHB's first meeting of the semester was about energy efficiency practices. Their next meeting, on Oct. 8, will focus on geothermal systems. On Nov. 12, NAHB will have a presentation about the SAVE program.

NAHB is also involved in community service where members can learn the basics of using simple handtools. Jobsite and facility tours are also very important to the group. NAHB has many hands-on opportunities to see houses and facilities where building products are made. On Sept. 26, around 20 members went to Des Moines to tour the ReWall Company. This fall, NAHB will raffle off a set of Bags Boards for a social event in December. Tickets can be purchased from Eric Johnson (ejohnson@iastate.edu) or Jack Viverito (viverito@iastate.edu). They are \$1 each or 6 for \$5. There are also ways to get free tickets; contact Eric or Jack for more details.

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



Bags Boards to be raffled at an NAHB social event in December.

American Society of Civil Engineers (ASCE)



ASCE promotes itself at the CCEE Fall 2014 Welcome Picnic on Sept. 9.

The American Society of Civil Engineers (ASCE) is a student organization that provides great opportunities for anyone interested in civil engineering. The group has two main subgroups—Steel Bridge and Concrete Canoe—which create hands-on experiences for those who are interested. ASCE holds speaker meetings which include presentations from professionals in the field, special events, social events that include tailgates and tournaments, and outreach events that include community service. ASCE is a great place to network with professionals and to make friends with other civil engineering students.

The Steel Bridge Team provides students with the opportunity to design and build a scaled-down bridge completely on their own. Last year, the group placed second overall at the 2013 Midwest Regional Conference and traveled to Seattle, Wash., for the national competition where, they placed fifth overall.

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.

