Interim Chair Letter

The Department Civil and Environmental Engineering has 122 years of contribution at the University of Utah. We look forward to continuing this tradition in education, discovery, and service. We are proud of the quality education offered at the undergraduate level. We invite the best and the brightest to enter our Department and mentor them through their formative years. In our Department, students have many opportunities for professional growth through student chapters of professional societies such as ACI, AGC, ANS, ASCE, Chi Epsilon, ITE, and WEF-AWRA. Every semester, I observe undergraduate students rise to the challenge and enjoy the signature experience offered in our capstone design course. The students provide an exceptional service to the community through this course by creating preliminary designs for real projects, many of which are built through funding by various agencies. The Department has one of the nation’s most rapidly growing and diverse faculty. The faculty is committed to teaching excellence as evidenced by the fact that in the 2011-12 academic year 70% of the Department’s faculty ranked in the top 15% of instructors in the College of Engineering.

The University of Utah is a Tier 1 Research Institution and offers multiple opportunities for students to participate in research. The Department offers exciting careers in the traditional areas of emphasis such as Environmental, Geotechnical and Construction Materials, Structural, Transportation, and Water Resources. In addition, the Department houses the Utah Nuclear Engineering Program. Many of the challenges facing the world today such as infrastructure, transportation, sustainable systems, energy, and clean water require an interdisciplinary approach. Our graduates as civil and environmental engineers are at the forefront of the efforts to address these critical issues. The Department offers a variety of courses and opportunities for creative solutions through innovation and research. In addition to performing research in their own area faculty are currently collaborating on several research projects, which include: (i) Materials and Structural, (ii) Geotechnical, Structural and Nuclear, and (iii) Nuclear and Transportation.

Our faculty is carrying out research with colleagues from other Departments and Colleges at the University of Utah, including Architecture + Planning, Atmospheric Sciences, Biology, City & Metropolitan Planning, Geography, Mechanical Engineering, Chemical Engineering, and Energy and Geoscience Institute. In addition, there is research being carried out with other universities including Brigham Young University, Colorado School of Mines, National Taiwan University, New Mexico Tech, North Dakota State University, Oklahoma University, Princeton University, Purdue University, San Jose State University, Stanford University, University of Georgia, University of Massachusetts, University of Memphis, University of Missouri, University of Nevada-Reno, University of South Florida, University of Toledo, University of Wyoming, and Utah State University. I consider these collaborations as positive developments in the evolution and growth of our Department.

The financial support of our outstanding students, and the input and support of our Alumni Society and Industrial Advisory Board are essential for our success. It is my strong belief that the Department of Civil and Environmental Engineering at the University of Utah will continue to train the leaders who will find solutions to the major challenges of our society.

Sincerely,

Chris Pantelides
Interim Chair

Spring 2013
Volume: 6, Issue: 2
2013 February Civil Engineering Panel Discussions

The Civil and Environmental Engineering Alumni Society has been holding panel discussions each Friday in February for students to learn more about the activities taking place in industry and to meet an array of outstanding engineers working in their field. The panel discussions were held at the Meldrum Civil Engineering Building in the Layton Auditorium and were well-attended by students and Faculty. Topics of each panel included job duties, career planning, experience needed, and various other topics. Some of the attendees for the Panel Discussion were; Uintah Environmental, UDOT, Central Utah Water Conservancy District, Ames Construction and Roundabouts USA.
Civil Engineering Capstone Design Course, Impacts Students, Community by Thad Kelling

Latest student team prepares comprehensive stormwater management plan for Jordan River

Seniors across campus have great opportunities to test their skills in capstone design courses. One that stands out for its rich experience and real-world impacts is in Civil Engineering. Year after year, students in this course get to work on real, local projects, and since launching in 2002, most of them have been implemented in one form or another.

“The focus of the class isn’t necessarily to save the world but to impact the local community,” says Steven Burian, associate professor in the Civil and Environmental Engineering Department.

The latest crop of students demonstrates the impact the course is having – both on the community and the students involved. In fall 2012, the class worked with the Jordan River Commission to develop a comprehensive stormwater management plan. It will be used to guide all development along the 1-mile-wide corridor where the river flows 51 miles from Utah Lake to the Great Salt Lake.

“Being involved with ‘real’ people, like the Jordan River Commission and other engineers involved with the Jordan River, brought an element to the class that made you feel like it wasn’t just another college course,” says Tyler Jepsen, a senior in civil engineering who served as a project manager.

All the other students in the class had similar experiences, producing not only a hefty 78-page guidance document but also elaborate, sample site plans to illustrate how county officials, developers and engineers can use the document. Working on a real project makes the course more stressful, but the students say it’s worth it.

“I actually enjoyed many of the high pressure situations,” Jepsen says. “There was always the chance that we would fail, and when the stakes were so high, succeeding was something that was that much sweeter.”

Hundreds of other design students have had a similar experience in this capstone course, designing roads, bridges, landfills and everything in between. Professor Larry Reaveley has taught the vast majority of these classes. In the process, they are making a major impact on the local community, while also furthering their educational careers.

“The course has allowed me to improve many skills needed to become a successful engineer in a classroom setting where the stakes are much lower than in a professional setting,” says Jeff Huber, another senior civil engineering and project manager on the stormwater project. “These skills help me stay ahead of the curve upon entering the professional field.”
Hassan Tavakol-Davani will be presenting in May at the EWRI Conference. Here is an abstract of his presentation;

**Title: “Developing Urban Water Infrastructure Modeling Approach to Control the Flood Damages and Reduce Life Cycle Impacts”**

In recent years, decentralized approaches in urban water infrastructure engineering have been studied to determine their relative environmental impacts and their ability to control stormwater quantity and quality in urban areas compared to traditional centralized approaches. In this paper, sustainability aspects of decentralizing urban water infrastructure systems in the City of Toledo, Ohio have been estimated through a Life Cycle Analysis (LCA) software package, EEAST, and long-term stormwater runoff control benefits have been simulated via the PC-SWMM model. The results have been compared to the current condition (centralized infrastructure).

Min Ook Kim will be presenting at the ACI Spring Conference. Here is an abstract of his presentation;

**Title: "Determination of Total Fracture Energy for Fiber-Reinforced Concrete"**

At the ACI spring convention, I will make a presentation on current experimental test procedures, analysis methodology, and computational modeling methods for determining and predicting the total fracture energy of fiber reinforced concrete in an attempt to provide insight on causes of methodology inconsistencies.

Mohammad Javad Ameli Renani will be presenting at the 7th National Seismic Conference in May. Here is an abstract of his presentation;

**Title: “Seismic Evaluation of Grouted Splice Sleeve Connections for Precast Reinforced Concrete Bridge Piers”**

I will present preliminary results of two half scale bridge specimens tested recently at the structures laboratory, in which Grouted Splice Sleeves (GSS) were used to connect the precast components together. This type of connection may be considered as an effective ABC (Accelerated Bridge Construction) method in the moderate-to-high seismic regions, if it emulates the performance of the specimens without the GSS used currently in monolithic Construction.
Lucy Li will be presenting at the Gordon Research Conference in March. Here is an abstract of her presentation;

**Title:** “Multi-Drug Resistant Pumps Export Endocrine Disrupting Chemicals”

**Overview:** In our lab, we are studying how drug-resistant bacteria have become resistant to endocrine disrupting chemicals (EDCs) during wastewater treatment. Our research shows that one reason for the persistence of EDCs in the environment is due to chemical efflux mechanisms (drug-resistance) in bacteria. Before the EDC is degraded by bacteria, it is exported from the cell by drug-resistant proteins.

Jonathan Wood presented at the TRB Annual Meeting in January. Here is an abstract of his presentation;

**Title:** “Safety Impacts of Design Exceptions on Nonfreeway Segments”

Crash frequencies and crash severities of nonfreeway road segments in Utah with design exceptions were compared with crash frequencies and crash severities of comparable nonfreeway road segments in Utah that did not have design exceptions. The findings indicated that the crash frequencies and severities were no different between locations with and without design exceptions.

Erfan Goharian will be presenting at the EWRI Conference in May. Here is an abstract of his presentation;

**Title:** “Evaluating the reliability of a water supply system based on system dynamics modeling: A Case Study of Salt Lake City, Utah”

The impacts of the climate change on the performance of the water supply system. In our study, the performance of the Little Dell and Mountain Dell reservoirs have been evaluated.
CvEEN Research

Milan Zlatkovic made three presentations at the TRB Annual Meeting in January. Here are abstracts of his presentations;

Invited presentation: Simulating Transit Signal Priority through Various Software in the Loop Simulation Platforms. Presented at the AHB25 Traffic Signal Systems Committee Simulation Subcommittee meeting. The presentation summarized most widely used traffic control software for analyzing Transit Signal Priority (TSP) in traffic simulation. Experiences and ideas from several past research projects that dealt with this topic were showed. The presentation was useful for researchers and practitioners, since they presented some practice-ready ideas.

Leading author poster presentation: Effects of Queue Jumpers and Transit Signal Priority on Bus Rapid Transit. This paper looked into a combination of priority strategies for Bus Rapid Transit along the 3500 South corridor in West Valley City, UT, with a focus on implementing queue jumper lanes for buses at signalized intersections. The results showed that queue jumpers have a big potential in improving transit operations, without negative impacts on vehicular traffic, especially when combined with green extension and early green TSP. This paper was co-authored with Dr. Aleksandar Stevanovic and Zahid Reza of Florida Atlantic University.

Co-author poster presentation Evaluation of InSync Adaptive Traffic Signal Control in Microsimulation Environment. This paper evaluated the performance of InSync, a new adaptive traffic control system, through a comparison with different field or optimized time-of-day signal timing plans. The test site was a 4-mile corridor along the Dunlawton Avenue in Port Orange, FL. The results showed that in most cases the InSync adaptive system performed better than other signal timing plans. The leading author of this paper was Dr. Aleksandar Stevanovic of Florida Atlantic University.
Department Spotlight

The Making of a Concrete Canoe by Michael Ekenstam

Designing and building a concrete canoe to race at the regional concrete canoe competition is an exciting tradition at the University of Utah. Civil Engineering students have put over 500 hours into material testing, making a mold and construction of this year’s canoe. This year we have received lots of support from faculty, and local companies including Utelite and WB Parsons. Many people are amazed that concrete can float, but the true task is not achieving a lightweight canoe, but also one that can support the weight of four college students who will be rowing in the competition. We will be racing Arrollite, this year’s concrete canoe, named after its lightweight property and the use of Utelite®, at Utah State University on the first weekend in April. That’s right; we will be braving the bitter cold at Hyrum Dam Reservoir to race Arrollite at this year’s regional conference competition! Arrollite has been cast and is now ready for the final stages of sanding and painting to truly represent Utah pride. Our team has been prepping and getting ready for this competition since last September, including going to the gym to lift and be ready to row. We feel confident that our performance this year will show people that the University of Utah has got game!

Student Spotlight - John Heiberger

John Heiberger will be presenting on February 11, 2013 the results of a study titled ‘Infiltration and Potential Groundwater Recharge Performance of Urban Stormwater Bioretention Designed for Semiarid Climates’. Bioretention is a structure which captures runoff from small catchments and stores it in porous vegetated areas with the intent of infiltrating all or a large fraction of the annual runoff volume. The effects of bioretention on potential groundwater recharge are oftentimes unknown because of variable infiltration rates. This study examined the infiltration performance of a bioretention field site located on the University of Utah campus over the course of nine months between March, 2012 and November, 2012. Overall, this research indicates that bioretention is a viable stormwater best management practice in Utah. It was shown that with proper design and sizing, nearly all annual runoff volume can be controlled on site and either infiltrated or utilized by native plant species.
3rd ANNUAL
Civil Engineering Alumni Society Academy Awards Banquet

SAVE THE DATE
MAY 1, 2013

U of U Rice-Eccles Tower
451 South 1400 East, Suite 600
Salt Lake City, Utah

For more information visit:
www.civil.utah.edu

To purchase tickets visit:
https://umarket.utah.edu/civilmarket/