



engineering news

School of Engineering

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SANTA CLARA UNIVERSITY

DEAN'S MESSAGE

Convergence. It's a word that comes up often in conversation at SCU as we work toward implementation of a new integrated strategic plan for enrollment, facilities, and aspirations (www.scu.edu/santaclara2020). As SCU President Michael Engh, S.J., said, "Today, the University finds itself at a remarkable intersection: the convergence of history and tradition, great new challenges, and remarkable opportunities."

One of the opportunities being advanced is the physical convergence of faculty and students in STEM-related fields (science, technology, engineering, and mathematics) to promote synergies, foster creativity, and stimulate innovation and entrepreneurship. For months, faculty and staff from the School of Engineering and the College of Arts and Sciences have been meeting to explore how scientific knowledge and technological innovation in service of humanity can be advanced via co-location of our STEM disciplines.

Plans for a new STEM complex are in the works. With an end goal of distinguishing SCU as a leader in STEM education, workshops have been going on for months to determine how best we can blend classrooms, laboratories, makerspaces, and informal gathering areas to foster convergence and enable greater collaboration between the sciences and engineering.

Of course, engineering is, intrinsically, a collaborative endeavor; convergence is not a new concept for our community. The articles in this edition of *Engineering News* are rife with examples of convergence and collaboration—students working with external industry partners, graduate engineers supporting the Department of Athletics, and engineering professors teaming up to write about spirituality. No, convergence is nothing new to engineering, but the possibilities stemming from it are exciting. Happy reading!

Godfrey Mungal
Dean
School of Engineering

Making Connections

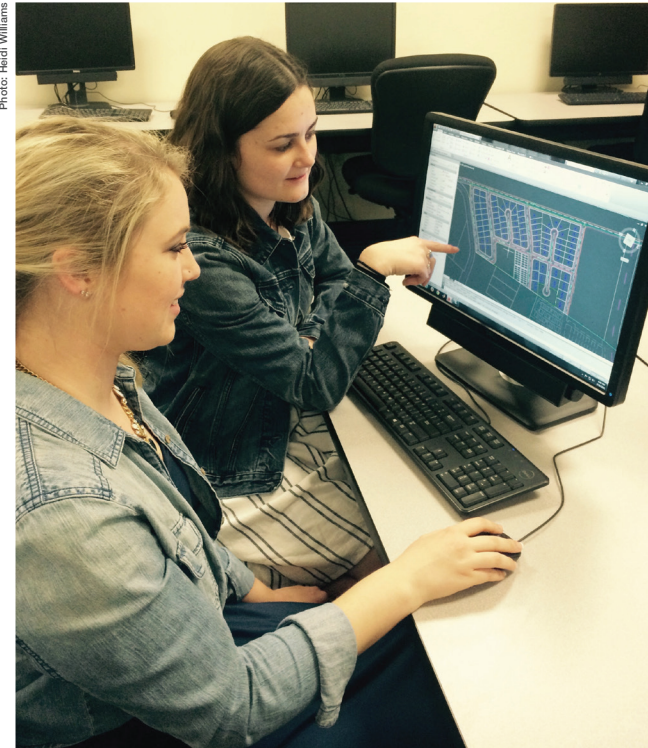
Sometimes, it's all about connections. For civil engineering seniors Ellen McKay and Kaelynn Willey, connections to faculty advisors, a fellow Bronco engineer, a local developer, and yes, even sewer lines, became paramount as they set out to plan and design a low environmental impact neighborhood district.

Their first important connections came when they selected associate professors Steven Chiesa and Rachel He as their project advisors. Chiesa, who specializes in wastewater management, and He, whose expertise is in transportation modeling, put them in touch with alumnus Chris Freitas '84, senior civil engineer for Santa Clara County, for help in finding a project they could dig into. "He showed us two plots; we chose the plot that made most sense to develop with a mix of single- and multi-family homes and an integrated commercial component," said McKay.

With their project identified, Freitas introduced them to Armintha Jensen, P.E., founding principal at Ruggeri-Jensen-Azar (RJA), an engineering, planning, and surveying firm in Gilroy, California. Jensen was enthusiastic about mentoring the up-and-coming female engineers. The pair met with their faculty and industry advisors regularly as they began plotting the streets, lots, and utilities. Their design work entailed using computer-aided software tools that went beyond the familiar AutoCAD—WaterCAD, SewerCAD, and StormCAD, to name a few.

Their proposal, which includes widening a two-lane country road, identifies where stop signs, ADA ramps, crosswalks, and bike and walking paths will best suit the community. It also lays out the sewer lines, pipe junctions, and fire hydrants.

Photo: Heidi Williams



From left: Kaelynn Willey and Ellen McKay

"We modeled using average and peak demand, turning on different hydrants to see if our plan was workable. The sewer uses a gravity system, which wasn't working with some of the initial elevations, so we learned how to fix that," said Willey.

"Through this process, we've learned that design is very iterative. If the model doesn't work, you have to change everything; it's not always right the first time and you have to be patient. We're lucky to have had the help of our advisors. When we get stuck, we talk to them and we have a new plan of attack," said McKay.

And after all, isn't fostering good connections what designing sustainable, family-friendly communities is all about?



CIVILS BEING CIVIL



Photo: Heidi Williams

From left: John Finnemore and Sukhmander Singh

For generations, civil engineering has been known as a “people-serving profession,” so maybe it shouldn’t come as a surprise that two Santa Clara University civil engineering professors recently teamed up to publish a paper aimed at helping humankind restore inner and world peace.

Colleagues John Finnemore (now professor emeritus) and professor Sukhmander Singh share a bond beyond their chosen profession; they both have a deep interest in spirituality. And while Singh has grown increasingly concerned about the “loss of harmony between the sublime/spiritual/divine in nature and within us” that separates us from “peaceful living within ourselves and among nations,” Finnemore has been championing spirituality as a means to nobility of character leading to peace and harmony.

The result of their collaboration is “Restoring Inner Peace in a Science Dominated Society,” a paper presented at The Religion in Society Knowledge Community Fifth International Conference on Religion and Spirituality in Society, at the University of California, Berkeley, this past April.

The authors are quick to point out that their definition of spirituality has nothing to do with religion; rather, it entails the development of personal responsibility, humility, sincerity, and integrity (among other traits) in the pursuit of being a channel for good.

“This work is consistent with the SCU mission to help humanity. We should strive to be of good character, conscious of suffering, and compassionate in our desire to relieve it. When we are in harmony with nature, and when we seek to behave with honesty, sincerity, and fairness, our rewards are far greater than any ego-driven pursuits. Someone has to raise a flag and pause to think about these things; that’s why we wrote this paper,” said Singh.

Finnemore, who recently compiled *Spiritual Light: Universal Teachings from the Highest Spirit Realms* (available via www.theusb.org) adds, “As a civil engineer, my focus was on environmental protection; I see this work as society protection. As a society, we have serious difficulties resolving conflicts, helping starving populations, and protecting our planet. We need to raise consciousness among different audiences, and this work is one way of doing that.”