



Postscript

Summertime, and engineering is easy

Something amazing happens to the University of Oklahoma each summer. While most undergraduates vacate the premises in May, by June the Norman campus has been re-populated by pint-sized doppelgangers complete with backpacks, water bottles and gym shorts. The season of summer camps — for everything from cheer and pom to football and wrestling — has arrived. Perhaps not as vocal as the cheerleaders, nor as numerous as the basketballers are the high school juniors and seniors who attend OU's Engineering Days.

Throughout June, the day camps attract more than 100 high school students from Arizona, Arkansas, Indiana, Missouri and Oklahoma, who have chosen to spend a Friday or Saturday exploring what it means to be an engineer. Students may elect to participate in one camp or all seven, representing each of the seven schools within the Gallogly College of Engineering.

"The activities are the same as what OU engineering students experience in their classes and they are taught by some of our own professors," says Jackie Foos, director of Engineering Recruiting and Outreach. "If you like what you see here, chances are engineering would be a good fit."

Students are often surprised by the relevant, hands-on projects offered at the camps. Those who spent the day with Dr. Chad Davis in Electrical and Computer Engineering learned how to "breadboard" electric circuits and assemble a hexacopter — a six-legged drone. Then each group tested their work by flying the copter around the atrium of Devon Hall. Davis's students also competed in a target obstacle course after connecting circuits to a water gun to make it easier to aim.

Across the board, the camps presented real-world problems that engineers are asked to solve. Those attending the day for industrial and systems engineering created amusement park layouts based on pedestrian flow to maximize the number of rides or shops park-goers could enjoy in a given length of time. Students interested in the biomedical field were introduced to the same CAD software for 3-D printing that is used in top research labs to develop organs using the patients' own cells.

While the caliber of experiments seems humbling for those of us who had trouble braiding an acceptable lanyard, Foos said one of the best things about Engineering Days is exploding the preconceived notions students sometimes have about the discipline.

"There are some people who are terrified of engineering until they see it in action," she says. "Stereotypically they think you have to be amazing in math and make straight As, and that's just not true. We have students at all levels of math who become successful engineers. We want high school students who attend these day camps to see engineering as an option, even if they didn't before."

Jeffrey Volz, associate professor of Civil Engineering and Environmental Science, says an art history class during his freshman year of college was instrumental to his becoming an

engineer. Inspired by the beauty of Gothic cathedrals, he realized he wanted to understand the structure as well.

"When you think about it, structural engineering is the foundation for society," Volz says. "It's not just a lot of 'boring' math. Civil engineers build things that have real-world applications."

After a discussion about basic design elements, Volz had students build towers with Popsicle sticks and hot glue guns. What might have been child's play turned challenging when the professor added that the finished buildings would have to support a two-pound bag of sand — and survive an earthquake.

Six teams crowded around the "shake table" in Fears Lab to see whose tower, if any, would survive. As the table began to shake, students learned that some buildings do better at higher frequency, some at lower, and that even with lowly Popsicle sticks as building materials, the right design can make the difference. This year, one out of six structures remained impervious to the shaking and the sand.

Behind the fun, of course, is a deeper purpose. With the state's economy riding a two-trick pony of oil and agriculture, the more diverse Oklahoma's workforce can become, the brighter its future. According to the National Math and Science Initiative, 60 percent of new jobs that will open in the 21st century will require skills possessed by only 20 percent of the current workforce. Dallas is now home to 21 Fortune 500 companies; only three are in the energy industry.

The number one resource these companies are looking for is an educated workforce packing a toolkit of fresh perspective and creative problem-solving skills. One of the best ways to prepare for that future is getting more students into the areas commonly known as STEM (science, technology, engineering and math).

"We do K-12 outreach all year round. We have about 3,000 kids who come in all year, but this is different," says Foos. "During Engineering Days high school students get an in-depth look with faculty they could be taking classes with. And that's something we really like and they really like."

Frances Lee, a junior at Lawton's Eisenhower High School, attended the computer science session where students learned fundamental coding to instruct robots. Lee's robot perfectly performed the maneuver she and her partner had programmed. "It was kind of cool learning how to make statements the robot would understand," says Lee. "And there wasn't as much math as I was expecting."

Summer at OU is a great time for students to explore what engineering has to offer without the pressure. And once they begin working with the professors, they realize it's "kind of cool." After all, once you see a teacher in shorts with a water pistol, it helps break the ice.

"I see a lot of kids come in, participate and a light bulb goes on," says Foos. "They know that this is where they want to be."

—Lynette Lobban