

by Franci Rogers



INTEGRATE FAITH AND WORKS
TO IMPROVE THE HUMAN CONDITION



WHEN SPENCE LANE GRADUATES FROM THE BAYLOR *School of Engineering and Computer Science,*

he will have more than a degree from a nationally recognized school. He will have more than the knowledge that came from Baylor's top professors in their innovative classrooms and laboratories. One of the most important things Lane will have is what he learned from a group of homeless, or nearly homeless, children from Waco, Texas.

Every Thursday night, Lane, a junior computer science major from Mexia, Texas, brings his computer skills to Compassion Ministries, a local organization that provides transitional housing to women, families and children who are homeless or on the verge of homelessness. He is in his third year of service.

"They don't have a computer tech person at Compassion Ministries, so I help in their computer lab, answering any questions they have," Lane said. "I like working with the kids there most of all. They come from all sorts of backgrounds, schools, and family situations. And they all really enjoy interacting with college students."

In addition to helping children in the computer lab, Lane also works on computers donated to the ministry and prepares them to be used by residents and program graduates.

For Lane, his volunteer service is a natural step in his Baylor education.

"I like applying what I'm learning to influence people's lives, and to help people here and in other countries," he said.

About 60 of Lane's engineering and computer science classmates who feel the same way make up a student organization called Engineers with a Mission. The group, the first of its kind in the nation, was formed in 2004 around the same basic principles as groups like Engineers Without Borders, but with a Christian emphasis.

"We want to expose students to using technology to help people here and in the developing world," said Senior Lecturer Brian Thomas, who advises the group.

Since its inception, the group has welcomed speakers, led local community service projects and traveled abroad. They have traveled to Kenya twice and Honduras three times.

Thomas and his family spent seven weeks in Honduras in summer 2008. During that time, nine Baylor engineering students spent from two to six weeks living with the family and working on a hydroelectric project.

"We basically started a small energy business in Honduras this past summer," Thomas said. "The company is now locally run by three employees and they do everything themselves from maintenance to billing. We think we can replicate this idea of forming a company and turn into a micro-franchise."

They also are working with other schools at the university to help refine their plans.

"What we've learned on these trips is not only how to create and use appropriate technology, but also that we need a business plan to help sustain the company," he said. That's one area where they hope to begin working with the Baylor Hankamer School of Business. "Every time we do one of these projects, we learn so much about how we can do better next time. It's exciting to see."



While some students travel overseas to work on engineering and computer science projects, Lane and others find ways to help closer to campus.

For fall 2008, several students worked at World Hunger Relief Farm in Elm Mott, Texas. The farm is a Christian organization committed to the alleviation of hunger around the world through training, education and sustainable development.

Students from Engineers with a Mission have worked to create solar-powered lighting for the farm's mobile chicken coops. Because more light for the chickens means more eggs for the farm, the students' plan is to use solar power. The plan also will save manpower and energy by eliminating the need to relocate extension cords, as well as look for power sites, each time the mobile coops are moved.

Students also are working on the design, construction and installation of a wind turbine to generate electricity at the farm.

The wind turbine will provide an alternate source of energy for the farm, and it will give students experience in using appropriate technology (technology that is designed with special consideration to the environmental, ethical, cultural, social and economical aspects of the community it is intended for) and a direction for the future.

"After we're finished, we'll have our revised set of plans available," said Lane, who worked on the project. "It will be easier for another group to use those plans to install their own tower."

It is that kind of experience that Lane believes gives Baylor's Engineering and Computer Science program an edge.

"Working with developing my own projects, and the experience of working on a project that is not defined by a classroom is something that takes self-management and develops good career skills for when I'm out in the field."

Sometimes the classroom at Baylor becomes the field.

Dr. Walter Bradley, distinguished professor of engineering, is teaching his students that engineering is a profession of helping others.

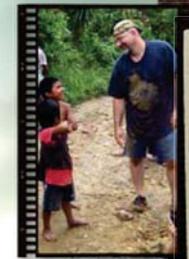
"In engineering, there are two approaches to helping people," Bradley said. "First, is building infrastructure, which is not so much engineering as just using well established technology."

For example, Bradley, along with Dean Ben Kelley, led a team of students who built a pedestrian bridge across a river in West Pokot, Kenya. The bridge gave people access to clean water, schools, medical care and a marketplace.

The second approach to helping people through engineering, Bradley noted, is creating new technologies.

"We're not just applying existing technology, we're creating long-term solutions for people," he said. "That doesn't minimize the first way, it just takes it a step further. We're identifying things that make a big economic impact for people."

One way the School of Engineering and Computer Science is creating new technology is by studying coconuts, an effort that led to the program receiving the Bosscher-Hammond Prize in December 2008. The prize recognizes work that "encourage the integration of faith, learning, and practice and demonstrate how the academic disciplines and professions can contribute to human flourishing."



In some cultures, the coconut tree is called the "Tree of A Thousand Uses," and Bradley and his students are discovering how accurate that phrase is.

Coconuts are used mostly for the oil, meat and milk, while the shell and the husk are thrown out as waste. Bradley and his team are discovering methods to use that waste to create new products and new opportunities for farmers.

"We're finding ways to use these under-utilized parts which brings the value of coconut from less than a dime each to about \$1 each for the farmer," Bradley said.

A patent is pending on the use of coconut husk fibers for automotive interior forms. Trunk and door panels can be made stronger and "greener" with renewable and abundant materials by using coconut fibers, rather than synthetic polyester fibers.

Students also are studying ways to use coconut fiber to make particleboard without the use of binders.

"You can create completely green particleboard if you can hot-press it at the right temperature and pressure," Bradley said. "It's green and it could be a lot cheaper."

Other uses being studied at Baylor include coconut pith as gardening and potting material and coconut shells as possible charcoal and filter material.

ECS students, working with the business school, plan during spring 2009 to formally establish a corporation to bring their coconut technology to many countries, where they will set up franchisees through their non-profit organization.

One Baylor graduate student and two undergraduates will be the first employees of the company.

In another program students are traveling to and working on homes in Armenia.

Pre-formed, recyclable polystyrene blocks are being created that allow for easy construction of energy-efficient homes in that country.

"The blocks are like giant Legos," Bradley said.

Steel reinforcing bars and concrete are used to strengthen the walls made from the blocks. The result is an eco-friendly, easy-to-build home that can withstand an 8.0 earthquake and last for more than 40 years.

"It's a good, solid construction with good insulation," Bradley said. "And once it's sprayed with stucco, it looks just like a California contemporary house."

Homes, churches and schools are being built using this system in Armenia and Mexico, through a non-profit partnership between Baylor, Point Loma Nazarene University and the Lazarian World Home Project.

"All of these projects are designed to not only bring new technology to these countries, but also to foster economic development for the people who live there," Bradley said. "It's doing business with what is called a triple bottom line. In a normal business situation, the bottom line is simply the profit, but in triple bottom line, the bottom line is a combination of profit, people and the planet."

And that's engineering with a true mission.