

Computer Science Merging with Electrical and Computer Engineering Department

The new Min Kao Electrical and Computer Engineering Building will now be home to a re-named and re-invigorated department: the Department of Electrical Engineering and Computer Science (EECS).

The merger of the Department of Electrical and Computer Engineering (ECE) and the Department of Computer Science (CS) was announced by UT Provost Robert Holub November 17, 2006. The joining of the two departments will be official July 1, 2007.

"We have a task force working right now to finalize details of the merger," said Dr. Samir El-Ghazaly, professor and head of the ECE department. "We are reviewing staffing, budget and administrative issues in order to work out the best arrangement for both departments. We will find a way to realize the benefits of the merger."

Dr. Jack Dongarra, a University Distinguished professor in the Department of Computer Science and the Director of the Innovative Computing Laboratory and the Center for Information Technology Research at UT, sees the merger as part of a nationwide trend.

"Most of the influential universities in the U.S. have a joint electrical engineering-computer science department," said Dongarra. "The combined department will be twice as large, and we will be able to have a broader depth of material available for teaching. We will also be able to offer more accessibility to students in the way of lab facilities and computing areas."

"Recent developments in computations, plus other initiatives going on at UT and ORNL show a strong bent toward this field. There is a particular emphasis on computing right now, since computers are part of most consumer products, from watches to television sets to automobiles. The emphasis is important," El-Ghazaly added.

Discussions are currently underway regarding a joint major combining academic components from both departments, Dongarra said.

The ECE department also enhanced the college's computing research partnership with ORNL by naming Dr. Thomas Zacharia, Director of the Joint Institute for Computational Sciences (JICS) as a full professor in the department. The JICS functions in tandem with ORNL's terascale computer laboratories, and is home to the Cray XT3, known as "Jaguar," currently listed as the 10th fastest computer in the world.

"We anticipate the merger will strengthen and enhance the UT-ORNL collaboration efforts in the computer and computations area," said El-Ghazaly.

A national search is also underway for a new head for the merged department.

Engineering Energy for a Better Environment

The term "global climate change" has made its way from headlines to classrooms as more and more professors turn toward their research fields to contribute answers to the global energy problem.

"It is scientifically proven, without a doubt, that global warming is a fact and human activity plays a role," said Dr. Loren Crabtree, chancellor of the University of Tennessee, Knoxville. "The question now is how do we deal with population, energy and the environment?"

Plant, housed within the Department of Mechanical, Aerospace and Biomedical Engineering (MABE). The project started in 2004 during UT's Environmental Semester, in which the university facilitated a grant competition for environmentally-related projects. John Miller, mechanical engineering master's student from the UT chapter of the Society of Automotive Engineers (SAE), won the competition with a proposal for an on-campus biodiesel production plant. After Miller graduated, the project lost steam until



Mechanical engineering senior Scott Curran (right) looks on as Dr. Loren Crabtree (left) pours biodiesel produced by the student-led UT Biodiesel project. The demonstration was part of last September's "Make Orange Green Week," which was developed to showcase environmental efforts on the Knoxville campus.

Professors, students and researchers in the College of Engineering (COE) are addressing these same questions as they apply engineering technologies to sustainable solutions in an effort to improve energy efficiency, production and consumption.

"The significant issue is the impact of energy production on the environment," said Dr. Wayne Davis, COE associate dean for research and technology. "Our insatiable desire to utilize gasoline causes a dependence on petrol-based fuels, which increases our dependence on foreign oil. As a result, the Department of Energy (DOE), various funding agencies and the federal government are looking at alternative energy sources, particularly alternative fuel sources in the transportation sector."

One initiative in the college that has received significant attention in the past year is the UT Biodiesel Pilot Production

Scott Curran and Sean Peterson, seniors in mechanical engineering, decided to take the \$10,000 grant and get to work building a test production plant.

Now, three years later, the UT biodiesel plant is in the middle of its first full-scale production batch and swimming in media attention for the innovative project. Kicking off the "Make Orange Green Week" last fall, Curran and Peterson unveiled the production plant and their plans to collect waste vegetable oil from UT Dining Services to convert into biodiesel for UT Facilities vehicles.

"The process is very slow right now," said Curran. "We will probably get 30 gallons of usable biodiesel from 40 gallons of waste vegetable oil." A reaction between vegetable oil, methanol and lye, similar to making soap, produces biodiesel. During the reaction, oil separates into glycerin and methyl esters, or

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From the Dean's Desk



Welcome to the Spring 2007 edition of *Tennessee Engineer*.

Our theme for this issue is the environment, and we are very excited about updating you on the ways in which both

the college and the university are discovering new methods to help enhance air and water quality, researching alternative forms of energy and determining ways to make our campus more environmentally friendly.

We are already utilizing current design and construction techniques to ensure that our new Min Kao Electrical Engineering and Computer Science Building is designated as a *green building*. UT Chancellor Loren Crabtree outlines other plans for the university's

Green Building Initiative in an article on page 5.

It is our hope that, with the construction of the new electrical and computer engineering building, Estabrook Hall and the Joint Institute for Advanced Materials (JIAM), the college can continue our progress toward improving and updating our laboratory and classroom facilities and offering our faculty and students more advanced study and research environments.

The Min Kao building will house the new Department of Electrical Engineering and Computer Science, created by a merger of the Department of Electrical and Computer Engineering and the Department of Computer Science. The official union of the two departments will take place July 1, 2007. For more information about this exciting new initiative, please see the article on page 1.

The college did receive good news in early November when an anonymous donor pledged \$50 million, the largest personal gift in UT history, to the university with the designation of that half of the gift be targeted to specific initiatives in Veterinary Medicine and the College of Engineering. The other half of the funding is to be designated for intercollegiate athletics, including the renovation of Neyland Stadium.

We are deeply grateful to the donors of this wonderful gift, and we plan to show our good stewardship by using these funds, as well as those from Dr. Min Kao and other generous supporters, to continue striving toward our goal to be one of the best engineering colleges in the nation.

We hope that you find this issue to be both interesting and informative. Please direct your comments to coe@utk.edu.

Way Kuo
Dean of Engineering and
University Distinguished Professor

Engineering Energy

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biodiesel. Once the reaction is complete, glycerin is drained off and the biodiesel is washed. When burned in diesel vehicles, biodiesel reduces the emission of harmful pollutants such as carbon monoxide, particulate matter, hydrocarbons and sulfur oxides in the air. Currently, no facility vehicles are running off biodiesel.

"We made an agreement with Facilities Services that we'd wait until we can test a sample of biodiesel that meets the required standards," said Curran. "We'd hate for them to get a bad taste in their mouth because of a bad batch of biodiesel, but we're on track to deliver some fuel to them by the end of the semester."

This year, students in mechanical engineering had the opportunity to learn more about biodiesel through a special topics class on biodiesel production and application. "The class is reading and writing intensive with a final paper on applications of biodiesel," said Curran. "Our focus is on sustainability and quality of biodiesel."

Curran and Peterson have had help along the way from COE alum Jonathan Overly, coordinator of the East Tennessee Clean Fuels Coalition (ETCFC), part of the DOE Clean Cities Program "designed to advance the nation's economic, environmental and energy security by supporting local decisions to adopt practices that contribute to the reduction of petroleum consumption," according to its website.

"UT's College of Engineering already has a track record with alternative fuels. The biodiesel project is a natural extension," said Overly. "Dean Kuo's goal is to give students the opportunity to leave here with experience. More collaboration and research sets the stage for UT to become a nationally recognized university as one of the players to move the frontier forward. Heads of research for the entire university see this and are supportive in trying to see where bioenergy and biofuels can fill its potential partnerships across the departments."

Recognizing the need for energy independence and sustainability is an important first step in reduction of global energy consumption. Improving energy efficiency is important in all facets of energy consumption in the United States, including vehicles, residential and commercial buildings.

"Numerous sources of energy exist, from solar to wind, to nuclear and biofuels such as ethanol and biodiesel," said Davis. "We need reduce our dependency on foreign oil and reduce our emissions of CO₂. If we succeed in developing and utilizing these alternative energy/fuel sources, then we have the potential to reduce the impact of global warming."

—Story by Amanda Womac

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