

THE DAILY ORANGE

Smart Grid Labs Prepare Electrical Engineering Students for Future Careers

By Nicki Gorny, Asst. News Editor

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In the basement of the L.C. Smith College of Engineering, \$400,000 of equipment is currently working to provide students training for the future of power grid technology.

The Smart Grid lab simulates the upgraded form of the power grid that supplies electricity to homes and businesses across the country. The lab was made possible through the \$2.5 million of federal stimulus money given to six New York schools, including Syracuse University, three years ago, said Chilukuri Mohan, chair of the electrical engineering and computer science department.

The lab at SU became operational in October, Mohan said, and students have been active in the lab through classes and independent work since then.

Since Smart Grid technology is expected to be implemented across the country in the coming years, access to the lab, in addition to a series of related curriculum offerings in the electrical engineering department, gives students a distinct advantage as they graduate and enter the workforce.

"I think it's a really good experience for students currently working in the lab, and when they go out and graduate, they already know how the technology works," said Savit Vajpayee, a graduate student in electrical engineering who has worked in the Smart Grid lab since January.

Smart Grid improves upon the existing power grid in several ways, Mohan said. Although the existing system enables electricity to flow in only one direction – from the generation site to individual customers – Smart Grid accounts for multiple renewable energy sources, such as solar or wind power, that may be installed in individual homes. Smart Grid also enables information about energy use to flow in two directions, so a customer who avoids using appliances at peak times may be charged less.

Students can see this in a hands-on environment in the lab, said Tomislav Bujanovic, a research associate professor in L.C. Smith who teaches several courses that utilize the lab. The lab includes a simulated Smart Grid, which includes a photovoltaic cell for solar energy and a wind turbine, as well as a simulated Smart Home, which demonstrates how a new form of a power meter records power usage within a household.

Because power generation is such a critical issue and a failure of the power grid has great consequences, implementation of Smart Grid has been slow, and few attempts have been made in New York, said Mohan, chair of the department.

Mohan said he expects Smart Grid to be implemented across the country in the next 10 years. However, this coincides with an expected gap in the workforce as many currently employed electrical engineers approach retirement. This is where the role of SU, and the new Smart Grid lab, becomes important.

"What we are trying to do is make sure that we can educate engineers who can operate the Smart Grid and work in this area where we know that there is a huge demand in a critical area for the entire nation," he said.

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To accomplish this, Mohan said the department has worked to “*revitalize*” its curriculum, including doubling and modifying courses related to Smart Grid; incorporating hands-on experiences in the Smart Grid lab; and developing a new power systems concentration within the electrical engineering program.

Since the 2011-2012 academic year, at least four courses related to power electronics have been started, Bujanovic said, and more courses will be added to the curriculum next year. Each of these classes requires students to spend time in the lab.

Vajpayee, the graduate student, said he doesn’t expect to work with Smart Grid immediately when he graduates in December, but thought that within one or two years, he’d be able to utilize his knowledge of the technology in the workforce.

He has long been interested in Smart Grid, he said, but had never actually seen the technology until he requested permission to work in the lab at the beginning of the spring semester. This interactive experience, he said, will give him an advantage against students at other schools as he looks for a job in the power systems industry.