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UCF and Siemens unveil state of the art lab to turn students into digital grid tech experts

Homes and businesses can often be left without power for days or weeks after a severe hurricane or blizzard. And with the growth of renewables, utilities and power operators are faced with bringing these intermittent resources onto the grid while still providing their customers with reliable power.

A new lab unveiled Thursday at the University of Central Florida holds the promise of making these challenges a thing of the past. The new Siemens Digital Grid Lab, opened this week on UCF's campus, features cutting-edge technology used by many private and public utilities to manage the nation's power systems.

Longtime partners UCF and Siemens believe the lab will help produce the next generation of engineers to modernize America's energy grid. Students will now have hands-on training with real-world software and hardware to design and manage self-healing power-distribution grids to quickly recover from natural disasters, cyberattacks and other outages. They'll also train on the industry's latest microgrid software to manage and operate dynamic generation assets like solar, wind power, storage and electric vehicles.

The 660-square-foot lab will equip students with the latest skills needed to land jobs in the evolving energy field, an industry currently facing a skills gap akin to the nationally acknowledged talent gap in the manufacturing sector. A recent Department of Energy jobs report found that the country does not have enough workers to fill 1.5 million new energy jobs by 2030 and 75 percent of companies have challenges in hiring qualified candidates.

"The power grid is getting smarter, yet it will never be smart enough to run without workers who can manage it. The industry, even as it builds out a smarter – and yes, more automated – grid, needs more people like engineers who can work in control

centers or design electrical systems,” said Mike Carlson, President of Siemens Digital Grid in North America. “The energy jobs of today and tomorrow require the skills to match the new technologies that are moving our grid into the 21st century. We’re thrilled that this partnership with UCF will help further close the energy skills gap and give these students the experience that will strongly position them, and our country, for success.”

The lab is one of only a handful across the nation that give students hands-on experience in electrical grid technology and which incorporates traditional and renewable energy sources like solar and wind.

“The energy industry is rapidly evolving and demands highly skilled workers who can innovate and reimagine solutions,” UCF President John C. Hitt said. “This new lab bolsters UCF’s leading role in providing the top-notch talent that employers require and the problem solvers that society needs. And this elite facility will help expand a Siemens internship program at UCF that is one of the premier opportunities in our country for emerging engineers and computer science professionals.”

The lab will also feature software platforms that map out grid transmission needs and simulated models of the UCF campus power system where students will learn how to design and test a self-healing distribution grid. The lab can also be used to conduct simulations for-profit for commercial customers, helping energy users better analyze distributed generation assets. It is open to both undergraduate and graduate students. It also offers rich data for research to look at challenges in the future. Engineering Professor Wei Sun will lead the lab, which expects to accommodate about 120 students a year.

The lab adds to the growing hub of expertise at UCF, which includes programs aimed at modernizing and sustaining the nation’s power grid. Through collaborations such as FEEDER (<http://www.eecs.ucf.edu/FEEDER/>), programs such as ENERGISE (<https://energy.gov/eere/sunshot/enabling-extreme-real-time-grid-integration-solar-energy-energise>), multiple facilities on campus and research projects, students benefit from learning everything from theory and critical thinking, to experimentation and practical applications.

“People talk about making the grid efficient, incorporating different types of energy from traditional to renewable, but that’s not the only challenge,” said Zhihua Qu, chair of UCF’s Department of Electrical and Computer Engineering. “We need to look at making the system smart, so it knows what customers want and how to efficiently deliver it. And we must also make the entire system resilient.”

That means that if a storm or a manmade attack takes out part of the grid, it doesn’t result in entire communities being left without power for days or weeks.

“Making the power grid smart is a fantastic thing because it will improve lives and the economy,” Qu said. “The lab and the collaborative efforts of several professors and students here are leading us to that trigger point and we fully expect that the experience students get here will not only make them marketable, but it will make them leaders in the industry. They will innovate probably in ways we haven’t even envisioned yet.”

Students who have had early access to the lab are already raving about it.

“Some curricula in general lacks what the industry is actually using – it can be more of a research tool for academia,” said Matt Aberman, an electrical engineering graduate student. “The technology in this lab is the same technology used by industry. It ignites a spark in students for them to be passionate about the energy industry because while they’re in school they can actually work on something that’s real, that’s right in front of them. It can change how students are learning.”

This comprehensive program builds upon a decades-long strategic partnership with UCF, focused on fostering innovation, advancing technology and developing the next-generation workforce.

“For decades, Siemens has grown to be one of Orlando’s largest employers with a strong commitment to our community and a long history of collaborating with our hometown university, UCF,” said Orlando Mayor Buddy Dyer. “Like the many other successful partnerships forged between Siemens and UCF, the new Digital Smart Grid Lab supports the City’s continued efforts to make Orlando a national leader in sustainability, in training the next generation of high-tech workers and helping create high-wage jobs in emerging career fields.”

This past fall, Siemens provided UCF with an in-kind grant of product lifecycle management software with a commercial value of \$68 million – marking the largest grant in university history. For more than three decades, Siemens has called the Orlando area home, with a nearly 5,000-employee footprint spanning power generation, transmission and distribution, energy-efficient buildings and infrastructure, medical imaging and healthcare diagnostics.

Contact for journalists

Annie Satow (Siemens)

Phone: (202) 316-0219; E-mail: annie.seiple@siemens.com

Mark Schlueb (University of Central Florida)

Phone: (407) 399-8352; E-mail: mark.schlueb@ucf.edu

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About Siemens , UCF Partnership and Orlando Footprint

Siemens and UCF share a long history in the Central Florida community, and both are committed to fostering innovation, advancing technology and developing the next generation workforce. For more than three decades, Siemens has called the Orlando area home, including the company's Energy Hub, adjacent to UCF's main campus.

About UCF

The University of Central Florida, one of the largest universities in the nation with more than 64,000 students, uses the power of scale and the pursuit of excellence to make a better future for our students and society. Described by The Washington Post as demolishing "the popular belief that exclusivity is a virtue in higher education" and credited by Politico with creating a "seamless pipeline of social mobility," UCF is recognized as one of the best values in higher education. UCF aligns its teaching, research and service with the needs of the community and beyond, offering more than 200 degree programs at more than a dozen locations, including its main campus in Orlando. Faculty and students are creating innovations in areas as diverse as simulation and training, optics and lasers, hospitality management, video game design, business, education and health care to solve local and global problems. For more information, visit www.ucf.edu.

About Siemens

Siemens Corporation is a U.S. subsidiary of Siemens AG, a global powerhouse focusing on the areas of electrification, automation and digitalization. One of the world's largest producers of energy-efficient, resource-saving technologies, Siemens is a leading supplier of systems for power generation and transmission as well as medical diagnosis. With approximately 348,000 employees in more than 190 countries, Siemens reported worldwide revenue of \$86.2 billion in fiscal 2015. Siemens in the USA reported revenue of \$22.4 billion, including \$5.5 billion in exports, and employs approximately 50,000 people throughout all 50 states and Puerto Rico. For more information, visit www.usa.siemens.com.