UTC Foundation Focus is **EPIC**

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The utility industry's support of education and training is vital in combating the growing gap between an established community and incoming talent in the workforce. The newly launched UTC Foundation's (UTCF) mission – sponsoring educational incentives and programs to attract, retain and support top technology and telecommunications talent to foster the future workforce in critical infrastructure industries – addresses this concern. At this year's UTC Telecom & Technology in Charlotte, NC, UTCF took its first step towards fulfilling that mission by presenting a grant to the Energy Production and Infrastructure Center (EPIC) at UNC Charlotte. Sukumar Kamalasadan, Ph.D., Associate Professor, UNC Charlotte, said of the donation, "We are very fortunate to receive this award from the UTC Foundation. UTC's global presence and large membership base provides excellent opportunity for our students to enhance their education by addressing issues that are important to UTC members. The award is also a nice recognition of the relevance of UNC Charlotte and EPIC's energy related programs. It is indeed a great honor to be selected from more than 100 energy programs in the country. I hope this is the beginning of long-standing partnership between UTC and EPIC in the development of the energy-sector workforce of the future."

UTCF chose EPIC due to the continually vital role the facility plays in today's utility workforce, but also in consideration of the groundwork they are laying to secure the workforce of the future. EPIC is a joint effort between the university and its sponsors, bringing many disciplines together with a mission to "enhance the available technical workforce, advance technology, and facilitate strategic industry-university collaboration for the global energy industry..."[1]

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EPIC brings a wealth of knowledge to the table with its 75 professors and professionals. Offering programs at the undergraduate and graduate level, where the focus is predominately research and development. EPIC's labs and research equipment replicate the work being done by major players in the professional sphere in scale, size and technology, sometimes even surpassing it.

EPIC research centers include:

- The Center for Advanced Power Engineering Research (CAPER)
- Coal Ash and Liquid Management Office (CALM)

[1] http://epic.uncc.edu/about

- Technical Services
- Sustainability Integrated Buildings and Sites (SIBS)

The curriculum is organized into seven research clusters where today's energy challenges are addressed:

- Power System Modernization
- Large Energy Component Design and Manufacturing
- Energy and Environmental
- Renewables and Energy Efficient Devices
- Power Infrastructure Development
- Energy Analytics and Markets
- Transportation Energy

While the center's curriculum is impressive enough, at its heart, EPIC's success might just be in its understanding of the need to make energy as exciting and alluring as other careers available to young talent. It starts with the very architecture of EPIC's facility, thoughtfully designed by Creech & Associates. The main building, a testimony to clean energy, achieved LEED Gold certification. Some LEED aspects include rain gardens, a gray water system, day lighting, and a chilled beam system. In the EPIC building, students and visitors walk on locally harvested marble as they enter a sun lit, atrium-style lobby where a visitor or student can stand at the center of the immense facility and glance up past stacked circular overlooks all the way to a distinct, if understated, white ceiling. This atmosphere of fresh discovery travels past the entrance throughout the halls and into the rooms beyond. Within these walls, students can engage in research on a massive, almost exclusive, scale thanks in great part to benefactors such as Duke Energy, Siemens and Schweitzer Engineering, among many more. Arguably, most of the innovation happens in one of eight laboratories EPIC offers its students. These include:

The Duke Energy Smart Grid Laboratory (DESGL) - a state-of-the-art facility that supports the education, research and outreach activities needed to modernize the power grid. As computers have merged with the electric grid, the DESGL educates the engineers who will run this improved grid and allows them to perform research to achieve top efficiency in the new digital world. Both undergraduate and graduate students are granted real-world experience and taught necessary skills to engineer and design the next-generation power grid.

The EPIC HighBay Laboratory - an advanced, full-scale testing facility where faculty and students design and test resilient infrastructure systems, both above and below ground, many of which support the power industry...By researching energy infrastructure improvements and creating new designs, UNC Charlotte assists the energy industry in building reliable energy infrastructure components and systems. In one such project currently underway, Civil Engineering researchers in UNC Charlotte's Lee College of Engineering are working on a North Carolina Department of Transportation project to determine the axial bearing capacity of steel sheet piles used in short span bridges.

The Siemens Large Manufacturing Lab - Students and staff work with industry partners to identify strategic research themes and conduct basic and applied research aimed at improving the productivity and accuracy of large-scale manufacturing operations. Some of the current projects include: alternatives to broaching of turbine disk grooves, spiral milling of tapered holes and in-process metrology for generator rotors and volumetric accuracy.

The Photovoltaic Technology Research Laboratory fosters the science and engineering of solar energy by partnering with industry leaders to produce more low-cost and efficient solar cells.[3]

[2] http://mccrackenlopez.com/portfolio-item/uncc-energy-production-infrastructure-center-epic/

The center challenges students with contemporary industry concerns and solutions that will have real world impact; But beyond that, they feel engaged and part of something external to the traditional student/teacher roles. As Travis Rutledge, Senior in B.S., Computer Engineering, said of his experience, "The William States Lee College of Engineering at UNC Charlotte is something really special. Not only do we have a modern campus, but we have the EPIC building. Here, I have spent countless hours working on projects and studying for those midterms. Within our program, and [on our] facility, I have come in contact with many faculty members and professors I am now lucky enough to call friends. Not only do the professors here care about your success, many of them actively assisted me in reaching my goals in and outside of the classroom. I do not think I could have asked for a better campus and success network than the one I had at UNCC - EPIC." With experienced faculty, industry involvement and the perfect environment to foster innovation, EPIC has formed a bridge between a market that evolves at a merciless speed and the future workforce capable of the pace necessary to keep up with demands.

Not stopping there, EPIC strives beyond higher-education to achieve its founding ideologies. There is, for example, a veteran's program, customized for military personnel retiring into the workforce. At EPIC, this pool of talent is trained and paired with areas of the industry in need of revitalization. The center is also fleshing out ways to interact and foster excitement for engineering along all rungs of the learning ladder, starting with kindergarteners. Stepping into another key role, the facility uses its location in Charlotte, a city fast becoming a national hub for the energy industry, to provide a neutral zone where different viewpoints in a politically charged landscape can gather and exchange ideas. Two large auditoriums, each with capacities of up to 300, serve as a meeting place for leading public and private sector minds in both traditional and renewable energy. In this way, EPIC dedicates itself to the notion that academic institutions must not limit their role to producing the workforce of the future. Such establishments must also use their unique position to provide a neutral space in which the industry itself can come together and attempt a unified vision of what that future should look like.

EPIC can not achieve all this alone. It needs active contribution from the industry. And the industry is rising to the occasion. While there is real opportunity to benefit from the innovation flourishing in such collaborative environments, utility investment also showcases what utilities have to offer in terms of robust and fulfilling careers. Gaging by the steady path of success EPIC shares with its utility investors it is a model that will likely be replicated if the very real problem of the growing gap between those retiring and those entering the workforce is going to be resolved.

For more information about EPIC at UNC Charlotte, visit: epic.uncc.edu.

For more information about the UTC Foundation, or to make a donation, visit: utcfoundation.org ■

[3] http://epic.uncc.edu/laboratries