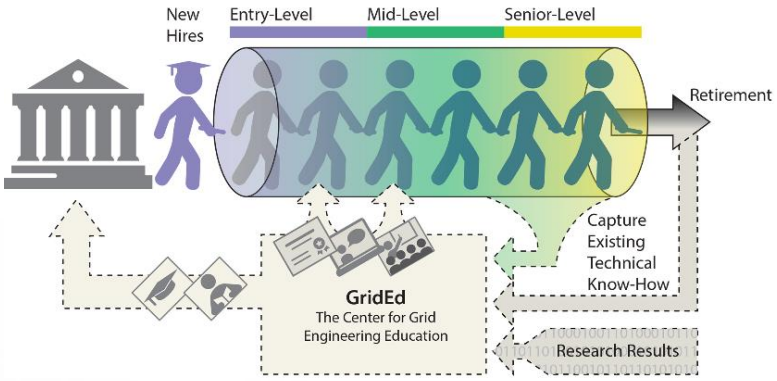
GridEd

The Center for Grid Engineering Education

2015 GridEd Report

In 2013, the Department of Energy (DOE), through its SunShot Initiative, awarded to EPRI a project known as Grid Engineering for Accelerated Renewable Energy Deployment (GEARED), an educational initiative to develop and train the next generation of power engineers so that they can help shape the electric grid of the future. In response, EPRI created GridEd—The Center for Grid Engineering Education, which is comprised of EPRI, our university partners (Georgia Technological Institute, University North Carolina Charlotte, Clarkson University, and University of Puerto Rico Mayaguez), and utility and industry sponsors.



GridEd Utility Advisors
Arkansas Electric Company Corp
Central Hudson
Consolidated Edison Co. of New York, Inc.
CPS Energy
DTE Energy
Duke Energy Carolinas
Entergy
FirstEnergy Service Company
LG&E and KU Energy LLC
Lincoln Electric System
National Grid
NYPA
Salt River Project
Southern Company

Leveraging the Industry

GridEd is anchored by 14 utility advisors and leverages electric industry research through EPRI and university engagement to educate a future electric grid workforce. The objective is to empower new and continuing education students not only to become competent and well-informed engineers but also to participate and influence major technological, social, and policy decisions that address critical global challenges. Additionally, GridEd connects its utilities, universities, and students with the larger GEARED network consisting of an additional 12 universities, 8 utilities, 12 industry representatives, and 2 national labs. Collaboration within the GEARED network consists of shared student conferences, innovation boards, and networking events.

Affiliate Universities

One of the most exciting aspects of GridEd is the extension of the university network through our utility sponsors to establish Affiliate universities and emphasize power engineering education at the regional and local levels. In 2015, GridEd welcomed 4 new Affiliate universities, for a total of 20, fostering new and enhancing established utility-university connections. New power engineering curricula and revisions to existing curricula were incorporated at Partner and Affiliate universities during the year, led by the University of North Carolina, Charlotte and Clarkson University. Planning began to disperse course content developed by GridEd to Affiliate universities through tech transfer events and seminars. Also in 2015, Affiliate university professors attended GridEd short courses, where they learned about the latest issues in applications of smart inverters and the investment decision-making process for utilities. Using the foundational pieces from the GridEd short courses, they added math and modeling, to create semester-long courses at their universities. Finally, by affiliation with GridEd, students at Affiliate universities had additional opportunities to engage in power engineering through the GridEd Student Innovation Board and GEARED student conferences.

GridEd Affiliate Universities
Akron University
Arizona State University
Buffalo State
Case Western Reserve University
Clemson University
Lawrence Technological University
Louisiana State University
New Mexico State University
North Carolina State University
Rensselaer Polytechnic Institute
State University of NY (SUNY) New Paltz
Syracuse University
University of Alabama Birmingham (UAB)
University of Louisville
University of Michigan Ann Arbor
University of Nebraska
University of New Orleans
University of Texas - SA
University of the Incarnate Word
Worcester Polytechnic Institute (WPI)

Short Course Program

In 2015, GridEd expanded the development and offerings of its short course program to address the educational needs of practicing engineers. The GridEd short course library expanded to include new courses such as Applications of Smart Inverters, Distributed Generation Technologies and Applications, and Distributed Generation Interconnection on Radial Distribution Systems. Courses were offered in a variety of formats to include live in-person, online, and hybrid. GridEd continued to survey utility sponsors to determine gaps in utility industry needs for worker training. Based on the gap assessment, new courses were developed and existing courses were offered again. Some courses were brought to utility sites at their request, with seats fully purchased for their staff. One of the most exciting aspects of this program was the conversion of short courses into full university curriculum by Case Western University and Clarkson University. In 2015, 161 attendees received a total of 1710 professional development hours through the GridEd Short Course Program. All GridEd short courses are open to the public and registration is accessible at http://grided.epri.com as courses become available.

Feedback from Short Course Evaluations

- *"Great blend of science with field applications."*
- *"The instructors have a broad knowledge of the inverter industry and research efforts."*
- *"The course is very timely about topics currently facing us."*

University Curriculum Design

The overarching goals and strategy of GridEd are to design and implement a sustainable business model to support the long-term impact of GridEd and to foster strong ties with the other GEARED consortia, professional associations like IEEE, international organizations whose goals are aligned with GridEd, and other entities of interest. Central to this objective is devising and designing new curriculum with our university network. In 2014, the University of North Carolina, Charlotte and Clarkson University spearheaded an inventory of power engineering courses at both the undergraduate and graduate levels between the four partnering universities of GridEd. Based on those findings and assessments within each university, the following courses were revised or added in 2015:

- Clarkson – Revised – EE 530 – "Dielectrics"
- Clarkson – New – EE 554 "Deregulated Power Systems"
- Clarkson – New – EE 552 "Optimization Techniques in Engineering"
- Georgia Tech – Revised – ECE 3072 – "Electrical Energy Systems"
- UNCC – Revised – ECGR 4144/5144 – "Power Electronics"
- UNCC – Revised – ECGR 4090/5090 – "Utility Applications of Power Electronics"
- UPRM – Revised – INEL 5406 "Design of Transmission and Distribution Systems"

Student Innovation Board (SIB)

GridEd's Student Innovation Board grew to 27 members in 2015 and officers were elected. SIB members participated in meetings, workshops and presented on GEARED and GridEd at IEEE PES round-tables. Students participated in the GEARED Poster Competition at the North American Power Symposium (NAPS) Conference at UNC Charlotte in October. SIB member, Monica Mercado, a senior undergraduate student from the University of Puerto Rico – Mayaguez won 1st Prize with a poster titled "Residential Grid-Tied Photovoltaic Energy System Design in Puerto Rico."

Summary of 2015 Outputs

- 8 short courses delivered
- 5 revised under/graduate courses
- 2 new graduate courses
- 3 GEARED Executive Committee Meetings
- 4 K-12 Outreach Events
- 2 GridEd Advisory Workshops
- 2 SIB meetings and 1 webcast
- 1 Seminar in Puerto Rico
- 1 Affiliate University Webcast
- 1 GEARED Student Conference
- 12 GEARED Coordination Calls
- 22 GridEd Planning Calls
- Fundamentals of Power Course
- Student Engagement via Conferences and Innovation Boards
- K-12 Outreach

GridEd Focus Areas for 2016

- Additional Short Course Offerings
- New/Revised University Courses

GridEd Expansion

In July 2015, EPRI submitted a proposal to U.S. DOE to expand the GridEd reach with a formal program into the western U.S. Additional university partners in that effort include Arizona State University, Portland State University, and University of California, Riverside. Further, an expanded Affiliates universities pool, utility, and electric industry network will be created in the west. The proposal was accepted and a final agreement will be completed in 2016 to launch that effort.

For More Information:

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