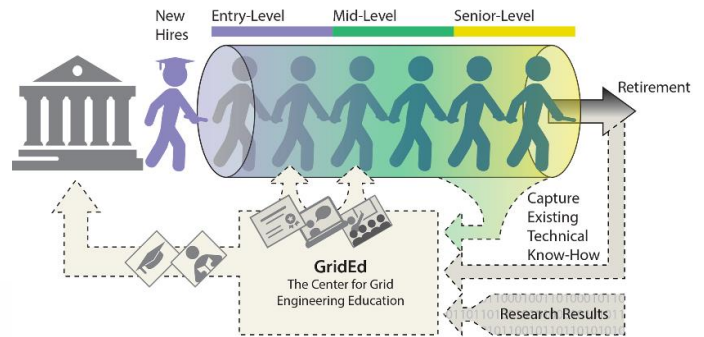


# GRIDEd

The Center for Grid Engineering Education

## 2019-2020 GridEd Summary Report

EPRI continues to build a formative Workforce Development initiative as it leverages the original Department of Energy (DOE) award from 2013 that led to the creation of GridEd—The Center for Grid Engineering Education. Valuable elements of the previous activities are being sustained as the evolution of the electric industry continues to reshape how energy will be produced, delivered, and used by consumers. In May 2019, the DOE awarded EPRI a new initiative called Grid Ready Energy Analytics Training with Data (GREAT with Data) which focuses on workforce needs at the intersection of the traditional power system and digital systems. With this new award, GridEd is now comprised of EPRI, our five (5) Partner universities (Stoney Brook University, University of California—Riverside, University of Texas—Austin, Virginia Polytechnic University, and Washington State University-Pullman), participating utility sponsors, and our Affiliate university network. GREAT with Data leverages electric industry R&D results with digital power systems engineering educational expertise to form a team of industry and university instructors for developing and delivering professional training, university curriculum materials, and educational offerings at various levels. GridEd’s objective is to empower 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.



2019-2020 Utility Advisors	
American Electric Power	New York Power Authority
Austin Energy	Salt River Project
Duke Energy	Southern California Edison
FirstEnergy	Southern Company
Lincoln Electric System	Tennessee Valley Authority
Portland General Electric	Western Area Power Authority

**Leveraging the Electric Industry:** Over seven-years, GridEd has leveraged \$7.3M in funding from DOE and another \$4M from electric utilities and universities. To date, GridEd has engaged 77 participating utilities, 70 universities, and 22 other electric industry organizational participants. The program has touched more than 3,100+ university students, taught short courses to more than 700 participants, granting some 8,500 professional development hours (PDHs).

### What is GREAT with Data?

GridEd’s new DOE funded [GREAT with Data initiative](#) will train and educate engineers and data scientists to address issues for merging Grid Operations Technology (OT) and Information Technology (IT), so they can design and develop the grid architecture and infrastructure to enable the integration of distributed energy resources (DER). The content of this effort addresses workforce skills in five key technical areas: (1) power system fundamentals, (2) data science; (3) cyber security; (4) information and communication technologies (ICT); and (5) integration of DER.

### Key Results from GREAT with Data

Although progress to date has been significantly impacted by the pandemic outbreak, the following has resulted:

- Formed strong technical and human resource advisory groups
- Development of a training roadmap informed by:
  - A [University Curriculum Gaps Assessment in Digital Power Systems Education](#)
  - A [Professional Training Gaps Assessment](#) including two course prioritization surveys to identify training needs
  - A [professional credentialing plan](#) based on feedback from twenty-two (22) utility advisors



- Established an impressive team of five (5) Partner universities to deliver education across different regions of the U.S.
- Hired an independent evaluator and developed a project evaluation plan including metrics to track project success.
- Established a [public repository](#) of course materials from twenty-one (21) courses that were developed under the DOE funded Grid Engineering for an Accelerated Renewable Energy Deployment (GEARED) program



**University Curricula:** In 2019 and 2020, GridEd’s five Partner universities have enriched a total of 15 university level courses in the four topical focus areas of the GREAT with Data initiative. This includes revisions to courses such as Cyber Physical Systems, Statistical Forecasting Techniques, Power Systems Under Abnormal Operating Conditions, and Smart Energy in the Information Age. There has been a total of 353 individual students enrolled in these courses. Student course and instructor evaluations indicate greater than 90% satisfaction with the overall courses and instructors. Further, student satisfaction averaged 84% on questions about knowledge attained, confidence in skills learned, and motivation to learn more about course topics .

**Affiliate University Engagement:** Our Affiliate university program currently includes twenty-one (21) schools and is a core ingredient for expanding the basic principle of GridEd – building strong relationships between universities and electric utilities. The GridEd approach is to improve the quality of future employees and create a partnership between the utility and its area and regional universities. Each participating utility can select universities for sponsorship. Affiliate universities have many opportunities to engage the GridEd program through shared course materials, student sponsored projects, and discounts to GridEd short courses (sometimes at no cost). In the 2019 school year, 25 undergraduate students participated in projects sponsored by GridEd with a power engineering theme at Affiliate universities. In lieu of a face to face Tech Transfer meeting between Partner and Affiliate universities, a series of virtual meetings were conducted to exchange ideas and learnings.

2019-2020 Affiliate Universities	
Arizona State University	Texas A&M Prairieview
California Polytechnic University	Tuskegee University
California State at LA	University at Buffalo
Colorado State University	University of Memphis
Iowa State University	University of Nebraska, Lincoln
New Mexico State	University of NC, Charlotte
North Carolina A&T	University of Pittsburgh
Oregon State University	University of PR Mayaguez
Portland State University	University of South Alabama
South Dakota State University	University of TN, Chattanooga
Southwest Texas State	

**Human Resource (HR) Committee:** The objective of GridEd’s HR Committee is to collaboratively share leading practices for the electric utility industry to attract and retain top talent given current trends and issues that are impacting the industry’s need for a diverse workforce. Since its relaunch in 2020, eleven (11) HR professionals from participating electric utilities have gathered to exchange ideas with several highlights including: (1) servicing employee needs during the COVID crisis, (2) re-evaluation of sustaining remote work policies for certain jobs, (3) highly valued skills including learning agility, communication (both written and verbal), and leadership, and (4) challenges related to developing internal processes to lack of internal analytical tools to identify skills gaps.

**Professional Short Course Program:** The COVID pandemic created a significant delay in delivering professional training courses which were originally designed to be provided in an in-person environment. All planned courses were modified for the live-online format. None the less, GridEd continues to expand short course development and offerings to address the educational needs of practicing engineers with emphasis on the impacts of digital and edge of grid technology. Based on course 70+ prioritization surveys from utility sponsors and universities, gaps in utility industry needs for employee training have been identified. The short course library has expanded and five courses were offered in 2020 including: [Machine Learning and Big Data Analytics in the Smart Grid](#), [Introduction to Energy Storage Series](#), [ICT for DERs and Systems](#), [DER Interconnection on Radial Distribution Systems](#), and [Electric Transportation Fundamentals](#). In 2019 and 2020, 194 attendees have received a total of 2,000 PDHs. Please visit the [GridEd website](#) for more information on short courses.

**Feedback from Short Course Evaluations**

- *“The professor’s expertise was most impressive. He clearly knew the material & understood what he was teaching.”*
- *“The course gave good insight towards future applications for data analytics.”*
- *“Great job explaining everything and making sure the class had a good base knowledge.”*

**Credentialing:** Based on feedback from twenty-two (22) utility advisors, GridEd will be implementing a new feature in the professional training activities that will include the option for participants to receive a higher course credential beyond a conventional PDH. These credentials will be provided to participants who pass an optional learning assessment based on the defined learning objectives of a course. The requirements and process to receive these credentials are posted on the [GridEd website](#).

**What’s Next?** GridEd continues to expand and tailor its activities to meet the workforce needs of our utility members. Additional short course offerings on new topics and through virtual formats will result in a more robust training program. Engagement with Affiliate university participants through tech transfer sessions will share enhanced course materials and identify strategies to connect traditional power systems and digital technology education. Additional materials will be qualified for inclusion in the repository from the GEARED program and a public facing Data Analytics Center of Excellence will be launched. Further, the GREAT with Data initiative will engage historical black college and universities to help expand the market with more human resources and address challenges of the electric industry as a whole in meeting its diversity goals.

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