Educational Activities for 'Cyber Infrastructure for the Smart Electrical Grid’

Dr. Anurag K. Srivastava
Assistant Professor, The School of Electrical Engineering and Computer Science
Director, Smart Grid Demonstration and Research Investigation Lab (SGDRIL)
asrivast@eecs.wsu.edu
The increasing convergence of power, communications, and information network is creating a need for new multi-disciplinary skill sets for the power industry employee.

Two 75-minute lectures per week.

{undergrad, grad} X {CptS, EE} X {Pullman, TriCities, online}

5 modules, 3 professors. Modules include:
1) introduction to electric grid,
2) communication networks,
3) data management and computing,
4) cyber security,
5) linking all topics together with case studies.

No Books, but reference material and selected book chapters.
Learning Objectives and Students Feedback to Date

• Offered in 2012, 2013 and 2014 Spring
• Evaluations from 23/27 students

Apply the interdisciplinary principles that I have learned in building secure smart grid infrastructure

Critically analyze the interdependencies of related infrastructure in the smart grid needed to sense, communicate, compute and control in secure way

Understand the principles of communication networks, data management, distributed computing and cyber security in context of the smart grid

Understand the basic principles of smart grid components and operation
Professional Online Masters Degree

☑ Transitioned to Global Campus through online MS Professional Engineering degree

☑ Online Professional Science Masters Degree in Electric Power Engineering

☑ Combines Courses in electric power engineering with engineering management courses

Beginning Fall 2014 - More information at: www.cea.wsu.edu/psm

Required Courses
- EE 521 – Analysis of Power Systems
- EE 526 – High Voltage Overhead Transmission Lines
- EE 536 – Power System Economics and Electricity

Elective Courses
- 10+ power engineering courses,
- 10+ engineering management and internship
Cyber-Physical Test Bed

Diagram showing layers and components of a cyber-physical system, including:
- Application Layer
- Communication Layer
- Sensor and Control Layer
- Power System Layer
- OpenPDC
- RT-VSMAC
- NS3
- Database
- PDC
- PMU
- Hardware Interface/Ethernet Internet
- RSCAD
- RTDS
- Wide Area Voltage Stability Application And OpenPDC

Image of people working in a lab environment with equipment and displays.