

WIDE AREA MONITORING AND CONTROL OF CYBER POWER SYSTEM

GOBAL INITIATIVE OF ACADEMIC NETWORKS

(26 - 30 December, 2017) Department of Electrical Engineering, NIT Warangal

Overview of the course:

The future power networks will become more complex and difficult to predict the steady state and transient conditions. Wide Area Monitoring and Control (WAMC) of Cyber Power System will become an indispensible addition to every control center. The WAMC architecture of communication systems depends on specific system needs like its topology, generation profile and quality of the infrastructure. The Phasor Measurement Unit (PMU) also known as synchrophasor is the basic building block of WAMC. The PMU senses the power system signals from voltage and current sensors and converts them into phasors. The phasors are complex number representations of the sampled signals commonly used in the design inputs to control the system for bulk transmission grids. The Phasor Data Concentrator (PDC) collects phasor data from multiple PMUs or other PDCs, aligns the data by time tag to create a synchronized dataset and then passes it to the application process. The PDC also performs data quality checks and validates its integrity or completeness and flags all missing or problematic ones. Microprocessor-based computer relaying information and advances in communications are changing the landscape of transmission system monitoring.

The Cyber Power System consists of two interconnected infrastructures viz., power network and cyber network. The cyber network monitors, protects and controls the power network. Without the cyber network, the power network cannot operate efficiently and reliably. Whereas the Cyber security is a term that relates to technologies, process and measures taken to protect data, communication networks, information technologies and computing system against unauthorized access or attack. One of the most problematic elements of cyber security is quick and constant evolving nature of security issues.

Objectives:

The primary objectives of the course are as follows:

- To create awareness to PMUs and PDCs.
- To provide practical applications of PMUs.
- To learn Cyber Power System and Cyber security.
- To control the Cyber Security in Smart grids.

Modules	This course consists of one module only and is scheduled from 26 th December, 2017 to 30 th December 2017.	
You Should Attend if you are	 Students of B.Tech, MTech, Research Scholars & faculty members of academic institutions. Executives, Engineers and Researchers from manufacturing, service and government organizations, including R&D laboratories. 	
Registration Fee	The Registration fee for attending the course is as follows:	
(Excluding Lodging & Boarding)	 For Students from India (Without grading) For Students from India (With grading) Faculty (Internal & External) and Scientists from R & D Labs Persons working in Industry / Consultancy firms 	Rs. 500/- Rs. 1,000/- Rs. 2,000/- Rs. 4,000/-
	Overseas Participants (Students)	US\$ 50
	Overseas Participants (Faculty/Scientists) US\$ 100	
	Please register through GIAN portal at http://www.gian.iitkgp.ac.in/GREGN/index After short listing for GIAN course you will be directed to pay the registration fee.	

Foreign Faculty



Dr. Anurag K. Srivastava earned his Ph.D. degree from Illinois Institute of Technology, Chicago, USA. He is the Director, Smart Grid Demonstration and Research Investigation Lab (SGDRIL) and an Associate Professor, Washington State University, USA. His

research interests include smart grid operation and control including security, stability, phasor data application, real-time simulation, electricity market, intelligent control and microgrid. He is recipient of several awards and serves as reviewer for several international journals and conferences.

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Host Faculty



Dr. D.M. Vinod Kumar earned his Ph.D. degree in Electrical Engineering from IIT Kanpur, India. He is a Professor in the Department of Electrical Engineering, NIT Warangal. His current research interests include AI techniques application in power systems,

Distribution system state estimation, Power system Deregulation, Power System Operation and Control, Distributed Generation Technology and Smart Grid Technologies.



Dr. Ch. Venkaiah earned his Ph.D. degree in Electrical Engineering from NIT Warangal, India. He is an Associate Professor in the Department of Electrical Engineering, NIT Warangal. His current research interests include AI applications to Power and Energy

systems, Power System deregulation and Restructuring, Economics and Financing Renewable Energy Technologies, Distributed Generation Technology, Power Procurement Strategy and Power Exchanges, Smart Grid Technologies and ICT applications to Power and Energy Systems.

Course Coordinators

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For Registration: http://www.gian.iitkgp.ac.in/GREGN/ index