Overview of the Course

The course covers renewable energy systems and distributed generation, focusing on solar photovoltaics, wind turbines, fuel cells, micro-turbines, and micro-hydro generation. It explores grid and micro grid integration, energy storage devices, and smart grid technologies like advanced metering infrastructure, demand side management, demand response, and electric vehicles. Emphasis is on efficient, environmentally friendly solutions to improve energy efficiency and reduce consumption.

The primary objectives of the course are as follows:

i) Equip with foundational knowledge of power systems, emphasizing distributed generation, micro grids, and smart grids.

ii) Enable to grasp the basic principles and applications of various distributed generation systems, highlighting their role in enhancing power system reliability and reducing network losses.

iii) Introduce to different types of energy storage devices used in power systems, including their characteristics, applications, and impact on energy management.

iv) Provide with a comprehensive understanding of various smart grid technologies, focusing on their functionality, benefits, and integration with distributed generation systems.

v) Discuss the advantages of renewable energy sources, such as solar and wind, and their long-term viability compared to traditional fuel sources.

vi) Equip with knowledge of current research trends and critical issues related to the development and deployment of smart grid technologies, preparing them for future challenges in the field.

vii) Encourage to apply their understanding of power systems, power electronics, electrical machines, and control theories to real-world scenarios in distributed generation and smart grid implementations.

Course contents

Day 1: Introduction of Smart Grid, Energy Internet, Advanced Metering Infrastructure (AMI) and Smart Meters.

Day 2: Introduction to Phasor Measurement Units and Applications Energy Storage Technologies – I and Energy Storage Technologies – II

Day 3: Energy Storage System Applications, focusing on load leveling and key issues. Overview of Distributed Generation (DG), its classifications, and applications in smart grids Mathematical Optimization, basics, and concludes with Microgrid, focusing on its structure, components, energy management, and volt/var regulation.

Day 4: Effects of penetrating microgrids with storage on conventional grids. Power Quality issues, analysis and its effect on smart grid. Power Converters in Smart Grid Applications. Simulation on Power Converters in Smart Grid Applications

Day 5: Basics of DSPACE Controller and OPAL-RT applications to Control Power converters in Smart Grid. Experimental demonstration of Power Converter Control with DSPACE controller and OPAL-RT

Who can attend?

- Scientists and researchers from government research organizations
- Faculty from academic institutes
- Engineers from industry
- Students at all levels (B.Tech/ M.Tech/ PhD)

शिक्षा मंत्रालय
MINISTRY OF EDUCATION
सत्यमेव जयते

GIAN
GLOBAL INITIATIVE OF ACADEMIC NETWORKS

Online Five-day GIAN course on
Renewable Energy Systems in Smart Grids
(**Course ID:** 2412129)

25-29 November 2024
(Online)

International Faculty
Prof. Xu Yan
**School of Electrical and Electronic Engineering
Nanyang Technological University (NTU),
Singapore**

Coordinators
Dr. G. Siva Kumar
Dr. T. Vinay Kumar

Organized by
Department of Electrical Engineering
National Institute of Technology Warangal
(An Institute of National Importance)
Warangal-506 004, Telangana State, India

About the Institute

National Institute of Technology Warangal, formerly known as Regional Engineering College was established in 1959. Over the years it has developed into a premier institute of higher learning and is ranked among the top technical education institutions in India. There are 14 Departments offering eight undergraduate and 31 post- graduate programmes besides doctoral programmes. About 5000 students across the country and about 500 international students' study in the campus. It is a fully residential campus sprawling over 250 acres with excellent infrastructure.

About the Department

The Department of Electrical Engineering is one of the oldest departments of the National Institute of Technology, Warangal (NITW). Established as one of the major departments of the Institute, in 1959, the department has been actively engaged in teaching and research in diverse fields of Electrical Engineering. With excellent faculty, the department offers Under Graduate (B.Tech) program in Electrical and Electronics Engineering and Post Graduate (M.Tech) programmes in "Power Electronics & Drives", "Power Systems Engineering" ,"Smart Electric Grid", "Control and Automation" and also offers Ph.D. programme in Electrical Engineering. The department has well-equipped state-of-the-art laboratories to augment the coursework and enhance the research potentials. The department has a dynamic group of faculties with profound experience in academics, research and industry, dedicated in teaching-learning process and actively engaged in the cutting-edge R&D activities with broad areas of expertise like; Power Electronic & Drives, Application of Power Electronics to Energy Efficient Lighting Systems, DSP controlled Industrial Drives, Electric Vehicle & Wireless Power Transfer and Power Quality Improvement, State Estimation and Real Time Control of Power Systems, Applications of ANN and Fuzzy Logic in Power Systems, Power System Deregulation, Power System Transients, Artificial Intelligence & Machine Learning etc.

About GIAN

About GIAN Course: Ministry of Human Resource Development (MHRD), Government of India (GoI) has launched an innovative program titled "Global Initiative of Academic Networks (GIAN)" in higher Education, in order to garner the best international experience. As part of this, internationally renowned Academicians and Scientists are invited to augment the Country's academic resources, accelerate the pace of quality reforms and elevate India's scientific and technological capacity to global excellence.

How to register for the course?

Fill out the Google form using the following link to complete the registration process.
https://forms.gle/aVu4wdvHjc1JoWP87
Candidates registering early will be given preference in shortlisting process.

Registration charges

Students & Research Scholars	Rs. 1,000/-
Faculty (Internal & External) and Scientists from R&D Labs	Rs. 1,250/-
Persons working in Industry/ Consultancy firms	Rs. 1,500/-
Students from abroad	US $50
Faculty/Scientists/Industry Participants from abroad	US $100

Note: Rs 500/- shall be charged extra for grading. The course fee is inclusive of 18% GST as per institute norm.
Last date for registration: **20-11-2024**

Details for NEFT

Account Name	Director Research Account
Account No.	62266262236
Bank	State Bank of India
Branch	NIT Branch, Warangal
Branch Code	20149
IFSC	SBIN0020149
MICR Code	506002030
SWIFT Code	SBININBBH14

International Faculty

XU YAN received his B.E. and M.E. degrees from South China University of Technology in 2008 and 2011, and PhD degree from The University of Newcastle, Newcastle, Australia in 2013. He conducted postdoctoral research at University of Sydney in Australia before joined Nanyang Technological University (NTU) in 2016. He is now the Cham Tao Soon Professor in Engineering (an endowed Professorship named after NTU's founding president). He is also the Director of Center for Power Engineering (CPE), and the Co-Director of Singapore Power – NTU Joint Lab. His research interests include power system stability, micro grids, and data-analytics for smart grid applications.

For any queries, please contact

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