



Overview of Course

Due to the increasing load demand and harmful greenhouse gas emissions from fossil fuels much emphasis is being given worldwide to produce electrical power from renewable energy (RE) sources, i.e., wind, and photovoltaic (PV), etc. The major advantages of these sources are that generally there is no fuel cost, and they don't produce CO₂ emissions. However, major problems with RE sources are that they are intermittent and variable in nature and therefore pose many challenges for power generation.

Power generation from wind is fast growing technology. The installed wind power capacity world-wide has reached the capacity of around 750 GW by the end of 2021. Wind power capacity has reached over 40 GW at the end of 2021, making India the fourth-largest wind power producer in the world. The country has a strong manufacturing base in wind power having several manufactures of different wind turbine models of international quality up to 3 MW in size with exports to Europe, USA and other countries. A few countries such as Denmark and Portugal have enhanced their wind installed capacity significantly compared to their grid capacity and they have started exploring strategies of safe operation for grids with high wind penetration levels. There has been significant development in the power generation from wind and power generation from single wind turbine has reached to the capacity of around 15 MW. It is expected that in near future, the wind turbine technology will mature enough to completely replace the conventional alternators. Moreover, the wind turbines can be installed both onshore and offshore providing them better avenues for power generation at a given wind speed.

The course covers the fastest growing wind systems in detail. Several aspects of wind and based power generating systems will be discussed with relevant numerical examples and simulation-based studies. Both the basic and advance contents of the wind and systems will be covered. Throughout the discussions in the course important research aspects of wind power will be deliberated with the participants in order to motivate them to take up their research problems from these emerging disciplines.

Course Contents

This course comprehensively covers the wind power based distributed generation. The salient points will be as follows::

- Wind system basic concepts and design,
- Power in the Wind,
- Generator Technology,
- Wind turbine modelling and control
- Onshore and Offshore wind farms,
- Wind distributed generation (DG) integration issues and interconnection requirements,
- Reliability and Challenges
- International Studies,
- Integration Experience,
- Renewable DG Energy Devices and Systems
- Research and Development,
- Challenges and Future Trends

About The Institute

National Institute of Technology Delhi (NITD) is one of the thirty one NIT (s) established in the year 2010. NIT Delhi is an autonomous Institute which functions under the aegis of Ministry of Education, Government of India. It aims to provide instructions and research facilities in various disciplines of Engineering, Science and Technology, Management, Social Sciences and Humanities for advance learning and dissemination of knowledge. The academic activities of NIT Delhi were initiated at NIT Warangal in year 2010 which later moved to a temporary campus at Dwarka, New Delhi and recently institute has shifted in its permanent campus on NH-44. NIT Delhi offers the Undergraduate, postgraduate and Doctorate program in Electrical Engineering, Electronics & Communication Engineering and Computer Science Engineering. Over the years the institute has established itself as a premier Institution imparting technical education of a very high standard leading to the B.Tech, M.Tech and Ph.D.

About The Department

The Department of Electrical Engineering offers an undergraduate program in Electrical & Electronics Engineering, and one Postgraduate programs in Power Electronics & Drives. Department is also offers subjects in Interdisciplinary area of reliability and safety engineering.

About GIAN Course

MHRD, Govt. of India 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.

Who can participate?

- Faculty and Students at all levels (BTech/MSc/MTech/PhD) from reputed technical/academic institutions.
- Executives, engineers, Scientists, and researchers from manufacturing, service and government organizations including R&D laboratories.

How to Register?

Stage-1: Web Portal Registration:

Visit <http://www.gian.iitkgp.ac.in/GREGN/index> and create login User ID and Password. Fill up the blank registration form and do **web registration** by paying Rs. 500/- online through Net /Debit/Credit card. This provides the user with life time registration to enrol in any number of GIAN courses offered.

Stage-2: Course Registration:

Login to the **GIAN portal** with the **user ID** and **Password**

already created in **Stage-1**.

Click on Course Registration option at the top of Registration form. **Select** the Course titled "Wind Power based Distributed Generation" from the list and **click** on **Save** option. **Complete** your registration by clicking on 'Confirm Course'.

REGISTRATION FEE:

Students & Research Scholars	Rs. 500/-
Faculty (Internal & External)	Rs. 1000/-
Persons working in Industry/ Consultancy firms and Scientists from R&D Labs	Rs. 3000/-
Students from abroad	\$ 50
Faculty/Scientists/Industry Persons from abroad	\$ 100

Selection and Mode of Payment:

Selected candidates will be intimated through e-mail. They have to remit the necessary course fee to the Bank as per the details given below

Account Name: **GIAN NIT DELHI**
Account No: **092901001889**
Bank: **ICICI BANK**
Branch: **ICICI Bank Ltd, P63A, Alipur Road, Narela,
Delhi - 110040**
IFSC: **ICIC0000929**
MICR Code: **110229103**
SWIFT Code: **ICICINBBNRI**

For any queries, please contact the coordinator. This course shall be conducted in **ONLINE** mode as per Ministry of Education(MoE) guidelines.

Address for Correspondence

Dr. Vivek Shrivastava
Coordinator
Department of Electrical Engineering
National Institute of Technology Delhi
209, Administrative Block Plot No. FA7,
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The Faculty:

International Expert:



Prof. Ramesh Bansal has more than 25 years of diversified experience of research, scholarship of teaching and learning, accreditation, industrial, and academic leadership in several countries. Currently he is a Professor in the Department of Electrical Engineering at University of Sharjah and extraordinary professor at

University of Pretoria. Previously he was Professor and Group Head (Power) in the ECE Department at University of Pretoria (UP), South Africa. Prior to his appointment at UP, he was employed by the University of Queensland, Australia; University of the South Pacific, Fiji; BITS Pilani, India; and Civil Construction Wing, All India Radio. Prof. Bansal has significant experience of collaborating with industry and Government organizations. These utilities include NTPC (a 60 GW Indian power generation company), Powerlink, and ESKOM. He has made significant contribution to the development and delivery of BS and ME programmes for Utilities. He has extensive experience in the design and delivery of CPD programmes for professional engineers. He has carried out research and consultancy and attracted significant funding from Industry and Government Organizations. Prof. Bansal has published over 350 journal articles, presented papers at conferences, books and chapters in books. He has Google citations of over 13000 and h-index of 54. He has supervised 25 PhD, 4 Post Docs. His diversified research interests are in the areas of Renewable Energy (Wind, PV, DG, Micro Grid) and Smart Grid. Professor Bansal is an editor of several highly regarded journals, IET-RPG and IEEE Systems Journals. He is a Fellow and Chartered Engineer IET-UK, Fellow Institution of Engineers (India), and Senior Member of IEEE-USA.

GoogleScholar:<https://scholar.google.co.za/citations?user=xam0PsQAAAAJ&hl=en>

Host Faculty/Coordinator



Dr Vivek Shrivastava is a faculty member at National Institute of Technology Delhi. He has more than 18 years of experience of teaching and research. Dr. Shrivastava has supervised 05 Ph.D. scholars and published over 80 journal articles, and his diversified research interests are in the areas of reliability engineering, renewable energy and conventional power systems which include Wind, Photovoltaic (PV), Hybrid Power Systems, Distributed Generation, Grid Integration of Renewable Energy, Power Systems Analysis, and Smart Grid. Dr Shrivastava is an Editor/Associate Editor of the Journals, International Journal of Swarm Intelligence (IJSI) and International Journal of System Assurance Engineering and Management. He is a fellow of the Institution of Engineers (India), and Senior Member of the Institute of Electrical and Electronics Engineers (IEEE).

Important Dates

Last date for Receiving Application: 22nd April 2022
Last date for intimation to participants: 25th April 2022
Course Dates: April 29th - May 4, 2022