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Nambur (V), Pedakakani (M), Guntur (Dt.), Andhra Pradesh – 522 508, www.vvitguntur.com

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

A Report

on

AICTE Sponsored Two Weeks Faculty Development Programme

Phase-I: 2nd -14th October, 2020

Phase-II: 30th November- 12th December, 2020



AICTE Sponsored A Two Week Online FDP (Phase-I)



on

APPLICATION OF POWER ELECTRONICS IN RENEWABLE ENERGY SYSTEMS

(2nd -14th October, 2020)



Organised by

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

VASIREDDY VENKATADRI INSTITUTE OF TECHNOLOGY

(Autonomous)

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All India Council for Technical Education



Sponsored

Two week online Faculty Development Programme (Phase-1) On

"APPLICATIONS OF POWER **ELECTRONICS IN RENEWABLE ENERGY SYSTEMS"**

2nd- 14th November, 2020

Organized

by

Department of EEE



VASIREDDY VENKATADRI INSTITUTE OF TECHNOLOGY

Accredited by NBA & NAAC with "A" Grade Nambur, Guntur Dist.

Andhra Pradesh- 522 508
Ph: 0863-2293336. Fax: 0863-2293102
Website: www.vvitguntur.com

About the College

Vasireddy Venkatadri Institute Vasireddy Venkatadri Institute of Technology (VVIT) was established in the year 2007, under Social Educational Trust in Nambur village, Pedakakani mandal of Guntur district by Sri Vasireddy Vidyasagar. VVIT has self contained infrastructure located amidst the lush greenery of paddy and maize fields of Nambur located strategically between Guntur and Vijayawada, away from the hustle and bustle of the city life. In-house placement training team, absolute discipline, airconditioned classrooms, multimodal teaching methodology, a 300 KW rooftop solar power plant to supply green power make VVIT a uniquely different professional college. VVIT has Google Code lab and recognized as Centre of Excellence (COE) by APSSDC. The college has Wi-Fi enabled internet with a bandwidth of 140 Mbps.

of 140 Mbps.

The institute is permanently affiliated to JNTU Kakinada, approved by AlCTE and also an ISO 9001:2015 certified institution. All the branches CSE, ECE, EEE, ME, Civil & IT are accredited by NBA. The institution is also accredited by NAAC with "A" grade. The institute is offering 10 UG programmes in engineering and 5 PG programmes in M. Tech, with an intake of 1341 students every year.

About the Department

Electrical and Electronics Engineering department was established in the year 2007 Its graduates are serving the society since 2011 and have been mobile 2011 and have been making tremendous impact to the well being and development of the country. The department has been so structured, in terms of experienced staff and

excellent laboratory facilities. The department is offering both B. Tech and M. Tech with an intake of 180 and 18 respectively. The department is accredited by National Board of Accreditation for three years from 2017. The department provides ample opportunities to students to work on mini projects, develop communication skills, explore internship opportunities in industry and take active participation in national and international design contests.

About the FDP Programme:

Power Electronics technology has gone through dynamic evolution in the last few decades. Its applications are fast expanding in industrial through dynamic evolution in the last lew decades. Its applications are fast expanding in industrial, commercial, residential, transportation, utility, aerospace, and military environments. Power Electronics and the automatic control are important in decentralized generation of electric power by innovative wind power plants, photovoltaic cells or in the use of fuel cells. Power electronics plays significant role in harvesting power from renewable energy sources.

Tanics of the FDP:

- Topics of the FDP:

 Converters used for Renewable Energy
 - systems Phase Controlled converters and PWM
 - converters DC-DC Converters, Inverters, Multilevel
 - Inverters Simulation Techniques in Power
 - Electronics

 - Electronics
 Power Electronics in Solar PV Systems
 Research challenges in Grid feeding
 solar PV inverters
 Power Electronics in Wind energy
 systems
 Simulation and Analysis of Renewable Energy systems

Chief Patron

Sri Vasireddy Vidyasagar, Chairman

Patron

Sri S. Badari Prasad. Secretaru

Sri M. Sree Krishna, Joint Secretary

Dr. Y. Mallikariuna Reddy, Principal

Dr. K. Giri Babu, Dean of Studies

Dr.A.V Naresh Babu, Professor, HOD Dept. of EEE

Coordinator

Dr. D. Srilatha, Associate Professor, Dept. of EEE

Co-Coordinator

Mr. K. K. Vasishta Kumar, Assistant Professor Dept.

Organizing Committee

Dr. S. Ravindra, Profess

Dr. Ch. V. Suresh, Professor

Mr. Sk. Rasululla, Associate Professor

Mr. Ch. Rambabu, Associate Professor Mr. A. Hari Prasad, Associate Professor

Dr. P. Lakshman Naik, Associate Professor

Mr. I. L. J. Baktha Singh, Associate Professor

Mr. B. Srinivasa Raju, Assistant Professor

Mr. P. Mahamood Khan, Assistant Professor

Mr. A. Naveen Reddy, Assistant Professor Mr. A. Rahiman, Assistant Professor

Mr. Ch. Naga Sai Kalvan, Assistant Professor

Mrs. A. Anusha, Assistant Professor

Mrs. T.Vasavi Prathyusha, Assistant Professor

Mr. P. Nagarjuna, Assistant Professor

Resource Persons:

The Senior and Eminent speakers from premier institutes like IIT's, NIT's and Industry will deliver the lectures

Eligibility Criteria:

This programme is open to all AICTE approved Engineering college faculty, research scholars, and industry persons. Selection of participants will be on first-cum-first-serve

Registration Fee & other Information:

There is no registration fee. The interested participants need to submit the online registration form through the link:

https://forms.gle/uiP9pnxPu8XMUsty5



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Important Dates

Last date for registration 28th October 2020

9

Intimation of Selection 29th October 2020

Note: e-certificate will be provided to the participants based on attendance and marks secured in the test conducted at the end of the

Address for Correspondence

Dr. D.Srilatha Coordinator Department of EEE VVIT. Namburu. Guntur Dist., A.P - 522508



For any Querries contact

Mobile: 9502728191, 8008379079 e-mail: dandesrilatha.eee@gmail.com



AICTE Sponsored A Two Week Online FDP (Phase-II)



RECENT TRENDS IN POWER ELECTRONICS FOR GRID INTEGRATION OF RENEWABLE ENERGY SYSTEMS

(30th November- 12th December, 2020)



Organised by

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

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All India Council for Technical Education



Sponsored

Two week online Faculty Development Programme (Phase-2)

"RECENT TRENDS IN POWER ELECTRONICS FOR GRID INTEGRATION OF RENEWABLE **ENERGY SYSTEMS"**

30th November- 12th December, 2020

Organized

by

Department of EEE



VASIREDDY VENKATADRI INSTITUTE OF TECHNOLOGY

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Inverters

- Topics of the FDP:

 ❖ Converters used for Renewable Energy systems

 ❖ Phase Controlled converters and PWM
 - converters
 - DC-DC Converters, Inverters, Multilevel
 - Simulation Techniques in Power
 - Electronics Power Electronics in Solar PV Systems
 - Research challenges in Grid feeding solar PV inverters Power Electronics in Wind energy

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 Simulation and Analysis of Renewable
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https://chat.whatsapp.com/DSST4ShfybN7ulB hcaH9W3

- Important Dates
- Last date for registration 26th November 2020
 Intimation of Selection 27th November 2020

Note: e-certificate will be provided to the participants based on attendance and marks secured in the test conducted at the end of the programme.

Address for Correspondence

Dr. D.Srilatha Coordinator Department of EEE VVIT, Namburu, Guntur Dist., A.P - 522508



For any Queries contact

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<u>Department of Electrical and Electronics Engineering</u> <u>Report of Faculty Development Programme</u>

A two weeks faculty development programme was successfully conducted in the Vasireddy Venkatadri Institute of Technology in virtual mode with two phases, phase-I from 2nd -14th October, 2020 and phase –II from 30th November- 12th December, 2020 by the department of EEE. The FDP programme received an overwhelming response with 54 participants in phase -I and 48 participants in phase -II from various institutions.

NEED AND MOTIVATION

Electricity is one of the most important commodity. Life seems impossible without electricity. Power system deals with the generation, transmission, distribution and utilization of electrical energy. Power Electronics deals with the processing and control of electrical power from an electrical source into the form and quality suitable for a particular electrical load. Power System and Power Electronics are very important courses in the curriculum of Electrical Engineering and Electrical & Electronics Engineering. Every Engineer in the area of Electrical Engineering needs to have a detailed exposure to Power system and Power Electronics.

FDP OVERVIEW

Power electronics is interdisciplinary in nature and is used in a wide variety of applications, such as a cell phone charger, a personal computer, a microwave oven, an MRI system, a hybrid electric car, or even the electrical grid. The importance of power electronics has grown over the years due to several factors. A few of these are the advent of smart power devices and the increasing global concerns about the effects of environmental pollution. Smart power devices are expected to become ubiquitous and revolutionize the way power is handled. Electric vehicle is currently looked upon as a promising solution to curb urban pollution. Also, to avoid the pollution due to setting up of new power generating stations, power electronics has been called upon to ensure better utilization of existing capacity. The integration of power electronics with renewable energy sources such as solar and wind has a vast potential to meet the energy scarcity.

For huge amount of power transaction efficient means like HVDC and FACTS are employed. Power electronics is the heart of these power system technologies.



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This FDP will expose the participants to the recent developments in both the area of power electronics and power system technologies

CONTENTS

With the above stated objectives, an extensive coverage will be provided in this faculty

development program on the following aspects:

- Power Converters and Rectifiers
- DC-DC converters
- Inverters
- Simulation of Power Electronic Converters
- Power System Monitoring and Control
- Power System Stability
- Integration of Renewable energy sources

Objectives:

The objectives of the proposed FDP are,

- 1. To introduce the participant with important concepts and methods of control of power electronics.
- 2. To explore advanced schemes and optimization technologies required to improve the performance of the renewable energy sources utilisation.
- 3. To design the Power electronic converters for various renewable energy sytems.
- 4. To understand the various national and international standards used in the design of renewable energy systems.
- 5. To understand the different issues/challenges related to energy storage, and renewable energy sources integration.
- 6. To implement various optimization algorithms for the performance enhancement of renewable energy systems.

Expected Outcomes:

At the end of the FDP, the participants will be able to,

1. Demonstrate the application of important concepts learnt to the operation of individual renewable energy systems, their integrated systems



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- 2. Demonstrate the application of important concepts learnt to the topologies of the individual renewable energy systems, their integrated systems and.
- 3. Comprehend the advanced optimize the design technologies and controls to reduce size/volume and control techniques to enhance the performance of the power electronic controllers.
- 4. Apply the national and international standards, while designing the various components of PE with grid.

FDP (PHSAE-I) Programme Details:

DATE	SESSION DETAILS	
	Fore noon session (10am-12pm)	Afternoon session (2pm-4pm)
2.11.2020	Inauguration, Key note session by DR.S.SIVA NAGARAJU	Basics of Vector Control in Renewable Energy Applications by Dr. RAJIN M LINUS
3.11.2020	Implementation of Vector control in PMSG Based grid connected wind energy system with simulation by Dr. RAJIN M LINUS	Symmetrical and Asymmetrical Reduced Device Multilevel Inverter Topology by Dr. LALIT KUMAR SAHU
4.11.2020	Multiple Input converters and its applications by Dr. LALIT KUMAR SAHU	Overview of renewable power generation systems and their control by Dr. VARAPRASAD JANAMALA
5.11.2020	Maximum power point tracking of wind & PV system by Dr. RITULA THAKUR	Speed sensor less control of DFIG based Wind Energy System by Dr. D. GIRI BABU
6.11.2020	Grid synchronization techniques for grid-connected power converters by	Role of multi-level high power factor converters in power ad online grid connected RES by

		Dr. NAKKA.JAYARAM
	Dr. NAKKA.JAYARAM	DI. IMMMIONIIMM
7.11.2020	Battery energy storage for solar applications	Demand side management in Smart grid environment
	by	by
	Dr. JONNALA ROHITH BALAJI	Dr.B.LOKESH GUPTA
	11011111 2112 101	
9.11.2020	PV Simulator demo and MPPT	Grid-tied and off-grid solar systems by
	Technique	
	by	Dr.RAVINDRA .K
	Dr.MORE RAJU	
10.11.2020	Wind turbine generators and	Grid integration of wind power
	their components	by
	by	Dr.V.NAGA BHASKAR
	Dr.K.SRIKUMAR	
11.11.2020	Inverter Technology:	Introduction to various types of wind turbine
	Understanding battery inverters	generators and their power electronics
	and their role in energy storage by	components. by
	Dr.P.MOHANA KISHORE	Dr.V.NAGA BHASKAR
12.11.2020		Hardware demonstration on 1 kW grid-tied
12.11.2020	Variable speed control and its	solar photovoltaic system
	role in improving wind turbine	by
	efficiency. by	Dr.M.VENKATESWARARAO
	Dr. VARAPRASAD	
	JANAMALA	
13.11.2020	Understanding grid-tied solar	Battery energy storage for solar application
	systems, their benefits, and the role of grid-tie inverters.	by Dr. I.SATISH KUMAR
	by	DI. I.OMITOH KOMIK
14 11 0000	Dr. P. BARANI CHANDRA	MOO Took 9 17-1- 1:
14.11.2020	Yoga & Meditation by	MCQ Test &Valedictory
	MR. JAGADISH ČHITTALA	



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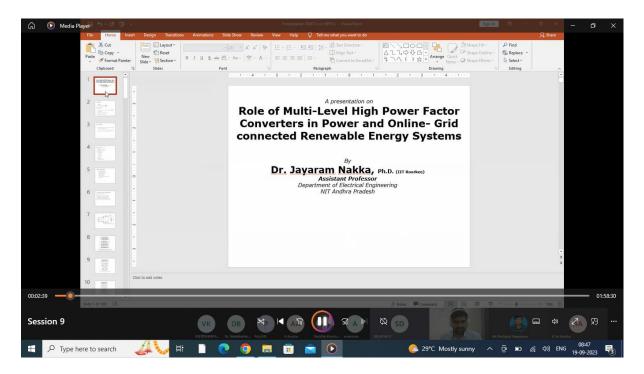


Fig: lecture by Dr. Nakka Jayaram, NIT AP

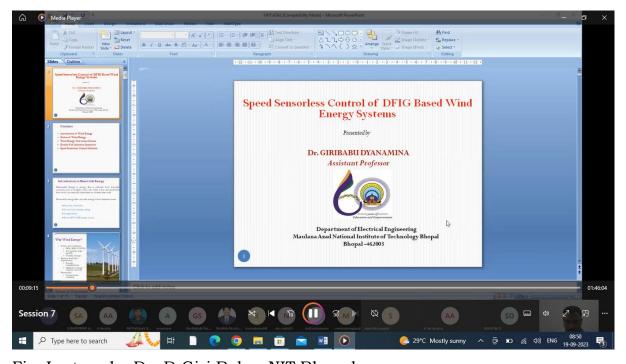


Fig: Lecture by Dr. D.Giri Babu, NIT Bhopal



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Fig: Lecture by Dr. Lalith Kumar Sahu, NIT Raipur

FDP (PHSAE-II) Programme Details:

Date	Fore Noon Session (10am-12pm)	After Noon Session (2pm- 4pm)
Day 1 30th November, 2020	Inauguration and Key note session Dr. Anup Kumar Panda NIT Rourkela	Basics of Vector Control in Renewable Energy Applications Dr.Rajin M Linus Sanjay Godhawat university
Day 2 1 st December, 2020	Simulation of wind power generation Dr.Ritula Thakur NITTTR, Chandigarh	Applications of power electronic converters Dr.Rajin M Linus Sanjay Godhawat university



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Day 3 2 nd December, 2020	Applications of multi-level converters Dr. Venkata Ramana Naik NIT, Rourkela	
Day 4 3 rd December, 2020	Simulation and analysis of grid integrated PV system Dr. Dasthagiri Reddy NIT, Trichy	
Day 5 4 th December, 2020	Role of Power electronics in electrical engineering Dr.O. Chandra shekar NIT Srinagar	Renewable energy sources and applications Dr.Gopala Krishna NIT Rourkela
Day 6 5 th December, 2020	Utilisation of renewable energy sources Dr.V K Harish PDPU, Gandhi Nagar	Control of power electronic converters Dr. M. Bala Subbareddy CBIT,Hyderabad
Day 7 7 th December, 2020	Real time applications of intelligent converters Dr. Prajof SVNIT,Surathkal	Review of PE converter control strategies applied for power system reliable operation
		J Venkata Ramanaiah, SVNIT,Surathkal
Day 8 8 th December, 2020	Enhancement of PE converter operation and control Dr. Balaji SVCET,Bhimavaram	
Day 9 9 th December, 2020	Optumal allocation of soft open points for hosting maximum renewable energy	Maximum power point tracking methods renewable energy generation
	Dr.Varaprasad Janamala Christ University, Bangalore	Dr.Y.V.Pavan kumar VIT AP



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Date	Fore Noon Session	After Noon Session
Dute	(10am-12pm)	(2pm- 4pm)
Day 10	Role of power electronics in Industries	
10 th December, 2020	.Dr.Tousif khan SRM, AP	
Day 11 11 th December, 2020	AI techniques for power system operation and control Dr. Prajof SVNIT,Surathkal .	Comparision of MPPT techniques for performance enhancement of RES Dr.Amarendra Mizoram state univ
Day 12 12 th December, 2020	Yoga & Meditation by MR. JAGADISH CHITTALA	MCQ Test &Valedictory



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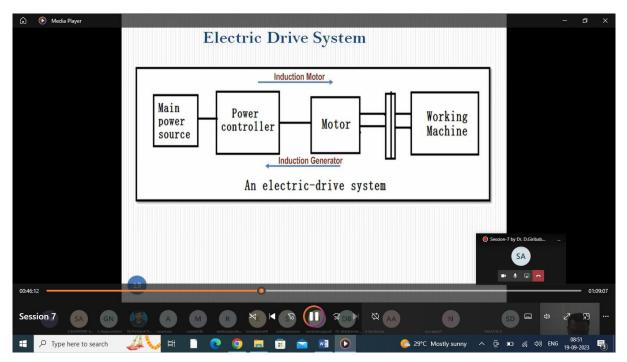


Fig: Lecture by Dr. Dasthagiri Reddy NIT, Trichy

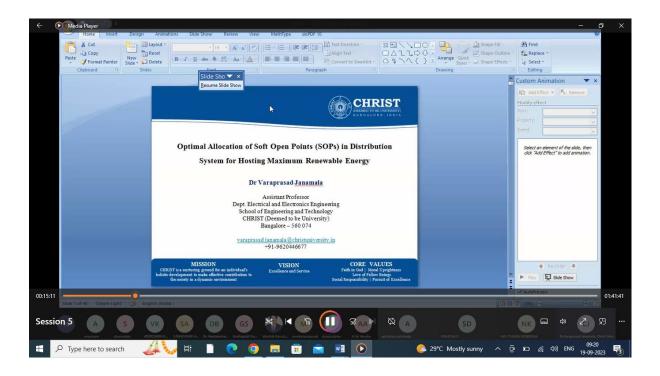


Fig: Lecture by Dr. Varaprasad Janamala Christ University, Bangalore



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The following feedback was received from the participants:

- 1. 84% of the participants felt that the delivery and presentation of the resource person was good.
- 2. 90% of the participants were of the opinion that the FDP brought practical knowledge of the subject in them.
- 3. 90% of the participants felt that the FDP was coordinated very well. Participants felt that such FDP should be arranged regularly.

Prof. D.Srilatha

(Coordinator-FDP)