SREE VENKATESWARA COLLEGE OF ENGINEER

NAAC 'A' Grade Accredited Institution
An ISO 9001:: 2015 Certified Institution
(Approved by AICTE, New Delhi and Affiliated to JNTU,Anantapur)
Northrajupalem (Vi), Kodavaluru(M) , S.P.S.R Nellore (Dt)-524316

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

LIST OF GUEST LECTURES/ TECHNICAL TALK

ACADEMIC YEAR	DATE	YEAR	TOPIC	RESOURCE PERSON
2022-23	07-03-2023	IV YEAR (2019 Batch)	Career opportunities in Electrical Engineering	Dr.B.Prakash Reddy , Senior manager , Microchip India Pvt Ltd, Hyderabad.
	19-12-2022	III YEAR (2020 Batch)	Renewable Energy & Power Electronics	Dr.M.Kiran Kumar Associate Professor and Associate Dean (Faculty and Staff Affairs) Department of EEE, K.L.Deemed to be University.

A GUEST LECTURE ON

"CAREER OPPORTUNITIES IN ELECTRICAL ENGINEERING"

Date: 09-03-2023

REPORT

The Electrical and Electronics Engineering department has organized a **Guest Lecture** on "**Career Opportunities in Electrical Engineering**" on **03rd March, 2023.** The resource person was **Dr. B. Prakash Reddy**, Senior manager, Microchip India Pvt Ltd, Hyderabad. The IV year students of EEE department have attended this guest lecture.

This guest lecture on "**Career Opportunities in Electrical Engineering**" was inaugurated by the principal of institute Dr. P. Kumar Babu and head of the department Dr. V. Anil kumar.

Dr. B. Prakash Reddy, Senior manager, Microchip India Pvt Ltd, Hyderabad. Experienced in implementation of Video pipe line, ISP cores and video protocols on FPGAs. Good understanding of Convolution Neural Networks (CNN) and hardware accelerators for running CNNs on FPGA. Architecture level design of optimized CNN accelerator engine for small sized FPGA implementation. And also Experienced in implementation of high

performance motor control algorithms on FPGAs, DSPs and MCUs. Profound knowledge and hands on experience in implementation of advanced vector control of BLDC, PMSM, Stepper motor, SRM and induction motor on drives of various power ratings.

The country today has an installed thermal generating capacity of around 190 GW. However, due to growing power demand, the shortages in energy and peaking requirements continue to exist. A large potential exists for achieving increased generation and efficiency improvement through Energy Efficient R & M (EE R&M) along with Life Extension beyond normal design life. With a view to improve performance of underperforming thermal power stations in the country, Government of India initiated Renovation & Modernisation programme in a structured way. Today a large number of unit's especially larger size units of 800 MW capacity and above are performing well in terms of plant load factor but need life extension and also there exist scope of efficiency improvement. Thus, there is an urgent need to achieve increased generation and efficiency improvement. In order to meet the growing power demand in the country, Govt. of India have taken number of initiatives which inter-alia include new multi modal generation capacity addition. Coal based Thermal generation continues to be the dominant source of power generation. So there are huge employees are required this sector i.e thermal power plants.

The forenoon session started with keynote lecture on Thermal power plant and its importance in power generation. It also provided the insights of thermal power plant which includes site selection of thermal power plant and line diagram of thermal power plant. The resource person also explained the functioning of each block in the line diagram of thermal power plant which includes coal handling plant, coal storage, boiler, economizer, air pre heater, chimney, steam turbine, alternator, ash handling plant, switch gear etc.

The afternoon session continued with opportunities in thermal power plants and renewable energy sources. The resource person explained about employees working in thermal plants, power project developments and career and opportunities in thermal power plant. Finally he concluded the session with the benefits of the employees working thermal power plants.

These days, it's clear that we need to rethink the way that we approach energy. With an on-going and ever-worsening environmental crisis looming, it's important that we do so sooner rather than later. Thankfully, renewable energy engineers are hard at work developing

solutions that will allow us to maintain our quality of life while helping the environment recover.

How do they perform this impressive feat? Renewable energy engineers use engineering principles of science and mathematics to research and design new methods of energy generation that don't harm the environment. Thanks to these engineers, we've already seen the development of carbon-neutral energy solutions like solar arrays, wind turbines and hydroelectric dams.

With the climate and environment on the line, we need more people to step up as renewable energy engineers and help optimize existing energy sources and create the clean energy sources of the future.

A GUEST LECTURE ON

"RENEWABLE ENERGY & POWER ELECTRONICS"

Date: 23-12-2022

REPORT

The Electrical and Electronics Engineering department has organized a **Guest Lecture** on **"Renewable Energy & Power Electronics"** on **19th December, 2022**. The resource person was **Dr. M. Kiran Kumar**, Associate Professor and Associate Dean (Faculty and Staff Affairs), Department of EEE, K.L.Deemed to be University. The III year students of EEE department have attended this guest lecture.

Resource Person Profile:

Dr. M. Kiran Kumar, Associate Professor and Associate Dean (Faculty and Staff Affairs), Department of EEE, K.L.Deemed to be University has published around 35 international journals in various filed of electrical engineering and he is working as associate professor from 2016 to till now in KL Deemed to be University

About Renewable Energy

Renewable energy is energy derived from natural sources that are replenished at a higher rate than they are consumed. Sunlight and wind, for example, are such sources that are constantly being replenished. Renewable energy sources are plentiful and all around us.

Fossil fuels - coal, oil and gas - on the other hand, are non-renewable resources that take hundreds of millions of years to form. Fossil fuels, when burned to produce energy, cause harmful greenhouse gas emissions, such as carbon dioxide.

Generating renewable energy creates far lower emissions than burning fossil fuels. Transitioning from fossil fuels, which currently account for the lion's share of emissions, to renewable energy is key to addressing the climate crisis.

Renewables are now cheaper in most countries, and generate three times more jobs than fossil fuels.

About Power Electronics

Power electronic devices such as Metal Oxide Silicon Field Effect Transistor (MOSFET), Insulated Gate bipolar Junction Transistor (IGBT), Integrated Gate Commutated

Thyristors (IGCT), Gate turn off Thyristor (GTO), Triode as an AC Switch (TRIAC) etc. has high current carrying capacity and high voltage handling capacity also. They have higher switching frequencies which is useful characteristics for voltage magnitude conversion and frequency control. These devices are used in converters. Depending upon the converter topology these converters are able to control the power flow also. Power electronics therefore plays a vital role in smart grid implementation and its development.

The forenoon session started with keynote lecture on Smart Grid which is the interconnection of generating stations and load centre and its importance in electrical power systems. It also provided the insights of power grid which includes Need of power grid, Site selection for power grid, Layout design, Bus bar schemes and Drawing of electrical layout. The resource person also explained the functioning of each block in the layout of the smart grid.

The afternoon session continued with the **Applications of power electronic devices**

Volt-Var Optimisation

Power electronic voltage regulators using TRIAC are used to regulate the voltage on the distribution feeders. The capacitor banks are used to boost the voltage of the line by generating Vars.

For integration of renewable energy sources

Exponential growth of renewable energy has been enabled in recent years, this is only because of technological advances in 'Power Electronics' devices and their ability to control power flow. Power electronics based Flexible AC Transmission (FACTS) technologies and automation technologies are necessary for smooth integration of renewable energy sources with the main grid.

Different energy sources are integrated with power electronic interfacing technologies as follows:

Large wind farms have been connected increasingly with the grid using technologies such as Power Electronic Voltage Source Converters (VSC), HVDC systems consisting of Dual Converters, FACTS and Static VAR compensators (SVC) with energy storage system. Now a days, Full scale converters are used as power electronic interface which is placed between the wind turbine generator and the main power Grid. This interface satisfies the generator and grid side requirements. These converters always ensure that the turbine speed is adjusted so that maximum power can be generated. Also, on the grid side, regardless of the speed of wind, this power electronic interface, controls frequency, active, reactive power as

well as voltage. The wind turbine generators, whether it is Double-Fed Induction Generator (DFIG) or variable speed Permanent Magnet Synchronous Machine (PMSM) rotate at asynchronous speed with respect to the frequency of the grid. DFIG uses Partial scale converters which are two-level Pulse width modulation Voltage source converters (VSC) and which have 30 per cent capacity of the wind turbine. These converters work at optimum operating points of the machine to produce electrical energy at 50/60Hz.Technically it shows full power controllability with a simple structure which is reliable and cost effective. For off-shore applications,

Wind turbines with Permanent Magnet machines always require full scale converters. These converters are mostly three-level Neutral point diode clamped back-to-back converters. These converters respond to frequency changes on both sides of DC link. The output power of the converters can be adjusted to maintain the system frequency. These types of converters give one more output voltage level and less dV/dt stress as compared to two-level converters. Therefore, it is possible to convert power at medium voltage level and lower current and use smaller filter size. These power electronic converters are simple modular structures with compact designs based on high power semiconductors, Integrated Gate Commutated Thyristors (IGCT) or Insulated Gate Bipolar Junction Thyristors (IGBT). Due to their compact design, these converters can fit inside the turbine tower along with the grid harmonic filters and generator harmonic filters.

For Electric Mobility in Smart Grid Environment

The main Purpose of Electric Vehicles is to fulfil all mobility needs at the costs equivalent to those of the conventional vehicles taking into consideration green-house gas emission reduction. The power train system of Electric vehicle consists of power electronic building blocks. such as voltage regulators, Choppers (DC-DC converters), Traction Inverters (DC-AC converters), on- board charger etc. Alternators require Voltage regulators are required to produce constant voltage at the battery terminals by modulation of field current. Choppers (DC-DC Converters) are used for soft-switching where the switches are subjected to low stress and therefore give longer -life. These covert 400 V to 12V in electric vehicle. As AC motors have high efficiency instead of DC motors, AC motors are used in Electric vehicles. Traction Inverters (DC-AC inverters) are used for to supply power, to AC motors which is stored in batteries of the Electric vehicle. On -board chargers are power electronic converters in rectification mode used to convert AC to DC in order to charge the batteries in the electric vehicle. All other components also like ignition switch, control module, vehicle speed sensor, steering sensor etc are power electronics devices.


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