VIDYUT

ESSENCE OF ELECTRICAL ENGINEERING

Vardhaman College of Engineering
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About the Department

Today, Electrical Engineering is at the forefront of the newest technology. The discipline has moved beyond wires and circuits into cutting-edge technology. The Department of Electrical & Electronics Engineering was established in 2002 with an intake of 60 and the number was increased to 90 in 2009 than to 120 in 2014. The department is also offering M. Tech (Power Electronics & Electrical Drives) with an intake of 18 from the academic year 2008 – 2009. The department is headed by Dr.N Kiran Kumar, with vast Teaching experience and is ably supported by 37 faculty members maintaining 1:15 ratio out of which 11 are with Ph. D qualification and 26 are with P.G. qualification. In addition, the department is supported by 10 Non-teaching staff. This program has been accredited by the National Board of Accreditation (NBA) till the year 2021. The department has very well-established Air-Conditioned Laboratories with sophisticated equipment supplementing the academic needs of the students.

VISION

Producing professionally competent graduates in the domain of electrical engineering to serve the industry/society addressing the challenges.

MISSION

- Provide professional skills in electrical circuit design and simulation to the students.
- Bringing awareness among the students with emerging technologies to meet the dynamic needs of the society.
- Develop industry institute interface for collaborative research, internship and entrepreneurial skills among the stakeholders.
- Encourage multi-disciplinary activities through research and continuous learning activities.

Program Educational Objectives

- Graduates will excel to make way to give solutions to real-time problems through technical knowledge and operational skills in the field of Electrical Engineering.
- Graduates will demonstrate their ability to acquaint with the ongoing trends in the field of Electrical Engineering to address the needs of the society.
- Graduates will communicate effectively as team players to cope with building a Prospective career.
- Graduates of the program will act with Integrity and have interpersonal skills in catering the need-based requirements blended with ethics and professionalism.

PROGRAM SPECIFIC OUTCOMES

- Conceptualize complex electrical and electronics systems, employ control strategies for power electronics related applications to prioritize societal requirements.
- Design, analyze and create energy efficient and eco-friendly power & energy systems.

About ETA (Electrical Technical Association

Electrical Technical Association (ETA) is a student organization for conducting career developing, interpersonal and intrapersonal skills for students. The department association was inaugurated in the year 2011 and is running successfully to nurture the budding engineers by conducting many core related competitions and encouraging them in a positive way.

Many innovative technical fests were conducted as a specimen. It organizes Seminars, Quiz Programmes, Industrial Visits, Paper Contests, Group Discussions, Guest Lectures, Career Guidance, Games etc. under its auspices. The students are encouraged to present papers and participate in seminars conducted in IITs, NITs and other engineering colleges. Industrial tours are arranged for students to familiarize exposure to industries.

Extension Lectures delivered by Industry Experts

Sl. No	Title of the Guest Lecture	Name of the Guest Speaker	Date	Target Audience
1	Role of Electrical Engineer in Lift Irrigation Schemes	Mr. K. Lakshmaiah, AEE	25-09-2020	II year
2	Power Electronics Applications In RES	Dr. Swami Naidu Assistant Professor IIT (BHU)	07-10-2020	IV year
3	Utility Smart Meter Data Collection & Utilization	Mr. Bharath Bhushan, Sr. Project Manager, HPL Electric & Power Ltd	10-10-2020	II & III Year

FDP Organized

Sl. No	Title of the Guest Lecture	Name of the Guest Speaker	Date	Target Audience
1	Fractional Order Robust Control System Design Series-I	Resource persons from Vardhaman College of Engineering	26-10-2020 to 31-10-2020	Faculty & PG students
2	Fractional Order Robust Control System Design Series-II	Resource persons from Vardhaman College of Engineering	23-11-2020 to 28-11-2020	Faculty & PG students

Guest Lectures Delivered

Sl. No	Title of the Guest Lecture	Name of the Resource Person	Date	Organized by
1	Multilevel Inverter fed Multiple Pole Pair Induction Motor Drives	Dr. N. Kirankumar	10.08.2020	Mahaveer Institute of Science & Technology, Hyderabad
2	Job Opportunities to Electrical Engineering Graduates and skills required	Dr. N. Kirankumar	11.11.2020	Andhra Pradesh State Skill Development Corporation
3	Introduction to MATLAB/Simulink	Dr. N. Kirankumar	12.11.2020	Andhra Pradesh State Skill Development Corporation
4	Performance Analysis of Power Electronic Converters using MATLAB/Simulink	Dr. N. Kirankumar	13.11.2020	Andhra Pradesh State Skill Development Corporation

Faculty Publications

List of Authors	Title of the Paper	Journal Name	ISBN/ ISSN/ Impact Factor
P. Tamilarasu, Dr. R. Shivakumar, Dr. K. Jaiganesh, M. Senthil Kumar, Dr. T. Logeswaran	Monitoring and Controlling Carbon Dioxide Emission from Vehicles	Journal of Advance Research in Dynamical & Control Systems	ISSN 1943-023X

Conference Publications

S.NO	List of Authors	Title of the paper	Title of the proceedings of the conference	Name of the conference
1	S. Rajalingam, S. Kanagamalliga , Iddrisu Danlard , **N. Karuppiah,**	"IoT based Sustainable Agriculture - Advances, Challenges and Opportunities",	Second International Conference on IoT, Social, Mobile, Analytics & Cloud in Computational Vision & Bio-Engineering (ISMAC-CVB 2020).	Second International Conference on IoT, Social, Mobile, Analytics & Cloud in Computational Vision & Bio-Engineering (ISMAC-CVB 2020).
2	**N. Karuppiah,**	Optimal placement and sizing of DGs using Voltage Stability index and Differential Evolution Algorithm	International Conference on Modern Research & Computations in Electrical Technology (ICMRCET–2020).	International Conference on Modern Research & Computations in Electrical Technology (ICMRCET–2020).
3	**N. Karuppiah,**	Performance comparison of FACTS incorporated DC/AC microgrid for rural electrification,	International Conference on Modern Research & Computations in Electrical Technology (ICMRCET–2020).	International Conference on Modern Research & Computations in Electrical Technology (ICMRCET–2020).
4	**K Muralidhar Goud,** C. srisailam, D Harsha, D sathish,	"Stability analysis of Automatic Voltage Regulator using Fractional Order Controller",	ICETEE-2020 Conference.	ICETEE-2020 Conference.
5	**N. Srinivas,** Dr. R. Brinda, Dr. T. Sairama,	"ENHANCEMENT OF POWER QUALITY BY USING DVR IN A SIX PHASE SYSTEM",	National Conference on Emerging Technologies in Energy Systems (NCETES-2020),	National Conference on Emerging Technologies in Energy Systems (NCETES-2020),

Patents Filed/Published by Faculty

Sl. No	Name of the Inventor	Title of the patent	Reference Number	Date
1	Dr. C. N. RAVI, Dr. INJETI SATISH KUMAR, **Dr. BALAGA HARISH**	AOVL- Voltage Load Protection: Automatic Over Voltage Under Voltage Load Protection And Distribution.	202041045339	19/10/2020 30/10/2020
2	N., VASANTHA GOWRI KHAN, AMER ALI B., ANIL KUMAR MOHAMMED, **IMRAN SHARIEFF MOHAMMED,** SAJID RAMAVATHU, SRINU NAIK MOHAMMED, ARSHAD	IoT and Machine Learning Based Power Quality Improvement System For Micro-Grid	2020104355	28/12/2020 28/12/2020

FDP/STTP Attended

S. No	Name of the Faculty	Name of the Program Attended	From Date	To Date
1.	Dr. N. Kiran Kumar	STTP on Electric Vehicle Battery Charging System With Renewable Energy Sources	02-11-2020	07-11-2020
2.	Dr. N. Kiran Kumar	STTP on Electric Vehicle Battery Charging System With Renewable Energy Sources	14-12-2020	19-12-2020
3.	Dr. N. Kiran Kumar	Recent Advancements in Electric Vehicle Technologies	08-12-2020	14-12-2020
4.	Dr. N. Kiran Kumar	Fractional Order Robust Control System Design (Series-I)	26-10-2020	31-10-2020
5.	Dr. N. Kiran Kumar	Fractional Order Robust Control System Design (Series-II)	23-11-2020	28-11-2020
6.	Dr. N. Karuppiah	Electric Vehicle (EV) Components, Technologies, Challenges and Future Development	07-12-2020	19-12-2020
7.	Dr. N. Karuppiah	Recent Developments in Power Electronics and its Applications	31-08-2020	05-09-2020
8.	Dr. S. Ravivarman	Electric Vehicle (EV) Components, Technologies, Challenges and Future Development	07-12-2020	19-12-2020
9.	Dr. K. Jaiganesh	Electric vehicle (EV) Components, Technologies, Challenges and Future Developments	07-12-2020	19-12-2020
10.	Prof. Md. Asif	Ensuring University Human Values Through Education	19-10-2020	23-10-2020

11.	Dr. K. Muralidhar Goud	Recent Developments in Power Electronics and its Applications	31-08-2020	05-09-2020
12.	Dr. T. C. Srinivasa Rao	Recent Developments in Power Electronics and its Applications	31-08-2020	05-09-2020
13.	Dr. B. Harish	Recent Developments in Power Electronics and its Applications	31-08-2020	05-09-2020
14.	Dr. B. Harish	Fractional Order Robust Control System Design (Series-I)	26-10-2020	31-10-2020
15.	Dr. B. Harish	Fractional Order Robust Control System Design (Series-II)	23-11-2020	28-11-2020
16.	Dr. Md. Imran Sharieff	Fractional Order Robust Control System Design (Series-I)	26-10-2020	31-10-2020
17.	Dr. Md. Imran Sharieff	Fractional Order Robust Control System Design (Series-II)	23-11-2020	28-11-2020
18.	Mr. D. Srinivasulu	Recent Developments in Power Electronics and its Applications	31-08-2020	05-09-2020
19.	Mr. B. Rajagopal Reddy	Recent Developments in Power Electronics and its Applications	31-08-2020	05-09-2020
20.	Mr. B. Rajagopal Reddy	Fractional Order Robust Control System Design (Series-I)	26-10-2020	31-10-2020
21.	Mr. B. Rajagopal Reddy	Fractional Order Robust Control System Design (Series-II)	23-11-2020	28-11-2020
22.	Mr. B. Rajagopal Reddy	NAAC Assessment and Accreditation Process	03-07-2020	03-07-2020
23.	Mr. B. Rajagopal Reddy	Research Challenges in Renewable Energy Technologies	14-09-2020	20-09-2020
24.	Mr. K. Kalyan Kumar	Advanced Waste Water Treatment Technology	27-07-2020	29-07-2020
25.	Mr. A. Ramakrishna	Fractional Order Robust Control System Design (Series-I)	26-10-2020	31-10-2020
26.	Mr. A. Ramakrishna	Fractional Order Robust Control System Design (Series-II)	23-11-2020	28-11-2020
27.	Mr. N. Srinivas	Renewable Energy Development in Deregulated Power Market: Future Scenario	12-10-2020	17-10-2020
28.	Mr. N. Srinivas	Fractional Order Robust Control System Design (Series-I)	26-10-2020	31-10-2020
29.	Mr. N. Srinivas	Recent Developments in Power Electronics and its Applications	31-08-2020	05-09-2020
30.	Mr. B. Mohan	Fractional Order Robust Control System Design (Series-I)	26-10-2020	31-10-2020
31.	Mr. B. Mohan	Fractional Order Robust Control System Design (Series-II)	23-11-2020	28-11-2020
32.	Mr. B. Mohan	Electric Vehicles	05-10-2020	09-10-2020
33.	Mr. B. Mohan	Controller Hardware-in-the-Loop Simulation: Tool for Future Electrical Engineers	24-07-2020	24-07-2020
34.	Mr. A. Ananda Kumar	Fractional Order Robust Control System Design (Series-I)	26-10-2020	31-10-2020
35.	Mr. A. Ananda Kumar	Fractional Order Robust Control System Design (Series-II)	23-11-2020	28-11-2020

Faculty Internships

36.S. No	37.Name of the Faculty	38.Name of the Program Attended	39.From Date	40.To Date
1.	Mr. A. Ananda Kumar	ISTE SPONSORED VIRTUAL INDUSTRIAL INTERNSHIP PROGRAM ON IOT	20-12-2020	26-12-2020
2.	Mr. A. Ananda Kumar	Internship on EV Design	21-09-2020	23-10-2020

Super Capacitors

The supercapacitor, or ultracapacitor, is electrically known as the electrochemical capacitor (EC) because it stores electrical charge in the electric double layer of a surface-electrolyte interface. This interface is primarily a high surface-area carbon. The large surface area, coupled with the tight area of the double layer, gives the device one of the highest capacitance outputs of any capacitor around. The first electrochemical capacitor device was patented by General Electric's H.I. Becker in 1957. Though a double-layer charge storage was used with this device, it was impractical because of the need to immerse it in a pool of electrolytes.

The standard EC design used today was invented by Robert A. Rightmire, a chemist at the Standard Oil Company of Ohio (SOHIO). SOHIO could not find a use for the application but patented the design to the Japanese company Nippon Electric Company (NEC). NEC sold the first commercially viable EC in 1975, called the "Supercapacitor." Though ECs today are commonly called supercapacitors or ultracapacitors, the only "true" supercapacitor is NEC's brand of ECs of the same name.

Active And Reactive Power Flow and Flicker On The Electrical Power Grid

Inverters are looked at by power utilities as "static" devices since they are not of the type classified as rotating machinery such as electric generators. The power companies require users, who put power back onto the grid, to have power factor control to compensate for quick changes in weather conditions that can affect the grid quality of power. This is especially the case with utility-scale inverters in a solar plant when a fast-moving cloud drops the power momentarily being generated by that solar plant facility onto multiple grids.

If one of those grids responds slower than another in trying to keep a 12 kV level steady within a small percentage variance, the slower grid could experience a drop as much as 5%, an unacceptable "voltage flicker". Magnitude of the "flicker" depends upon the "stiffness" of the line which involves voltage level, distance from the substation, size of the substation transformer and electrical design of a Solar Plant or Wind turbine facility.

Flicker can be a problem because it might affect the human body in some people who are sensitive to light density fluctuations and cause lack of concentration, general feelings of discomfort and even epileptic fits. Flicker can also cause reduction in the quality of welded connections.

Flicker compensation is different than reactive power compensation. During a flicker event, power factor is not targeted as much as keeping the voltage constant during rapid changes in load. Voltage drop during a load change is split into two components: a drop in actual voltage and a drop in reactive voltage.

These components' influence is described using the ratio of active resistance to reactive resistance of the grid impedance R/X. Capacitive reactive power will increase the voltage and inductive reactive power will decrease the voltage.

The goal of flicker compensation is to handle the mostly inductive. The compensation power can be fed through dynamic compensation systems and/or active mains power filters depending upon how dynamic are the load fluctuations. Another way can be changes to the operating behavior of the load or increases in the short-circuit capacity which will also help decrease flicker. The short-term behavior of the load needs to be measured in each case in order to configure a good flicker compensation.

Modern utility-scale inverters of the current source type on the market today are actually beneficial to the utility grid and help to correct the power quality available on the grid while still maximizing real power generation. These inverters can operate at power factor levels less than unity and still produce 100 percent of real power. The inverter has the ability to provide reactive power based on a function of the entire size of the inverter, not just on the level of generation. So, if cloudy skies drop solar generation from 100 percent to 10%, the inverter can use the other 90% of its remaining capacity to supply reactive power support and enhance utility grid power quality.

Students Participated in Internships

S. No.	Name of the Organisation	Year (I/II/III/IV)	No. of Students
1.	ACTS Techno Solutions	III	73
2.	CAD Desk	III	1
3.	Dhanush Engineering Services	III	1
4.	Hyderabad Institute of Electrical Engineers	III	48
5.	Internshala Trainings	III	4
6.	Kaashiv	III	3
7.	RCSS Group	III	1
8.	Verzes	III	1

Dealing With Discarded, Surplus, Leftover, Unused, Waste

The modernization of the societies, in a large measure, is technology driven. One of the negative consequences of this process is generation of waste at an increasing rate. We have to take appropriate actions to manage our waste; These actions are also bound to be technology driven. Our focus has to be reduction of waste material, their utilization and their recycling and to ensure their appropriate final disposal.

Why Waste should be Reused or Recycled?

Consumption pattern greatly affects the generation of consumer waste. Disposable goods and packages are increasingly used, more so in the developed countries. They enormously add to waste burden on the "throwaway" society and decrease the likelyhood of voluntary recycling.

We owe it to posterity to reduce the amount of waste we generate and the amount of natural resources which we deplete, often unnecessarily. Recycling results in reduction of landfills, conserves mineral, forest and other resources, reduces emission loads and improves economic vitality of a country. Recycling technologies need to be improved, or developed if not available, for waste related to automobiles, electronics, electrical, batteries, packaging, paper, textile scrap and residue, domestic and household waste, furniture, civil construction, agriculture and food processing, power stations, industries, etc. Innovative technologies, which are specific to various types of waste, which are compatible to local milieu, and which are techno-economically feasible, must be developed for reuse and for recycling of waste.