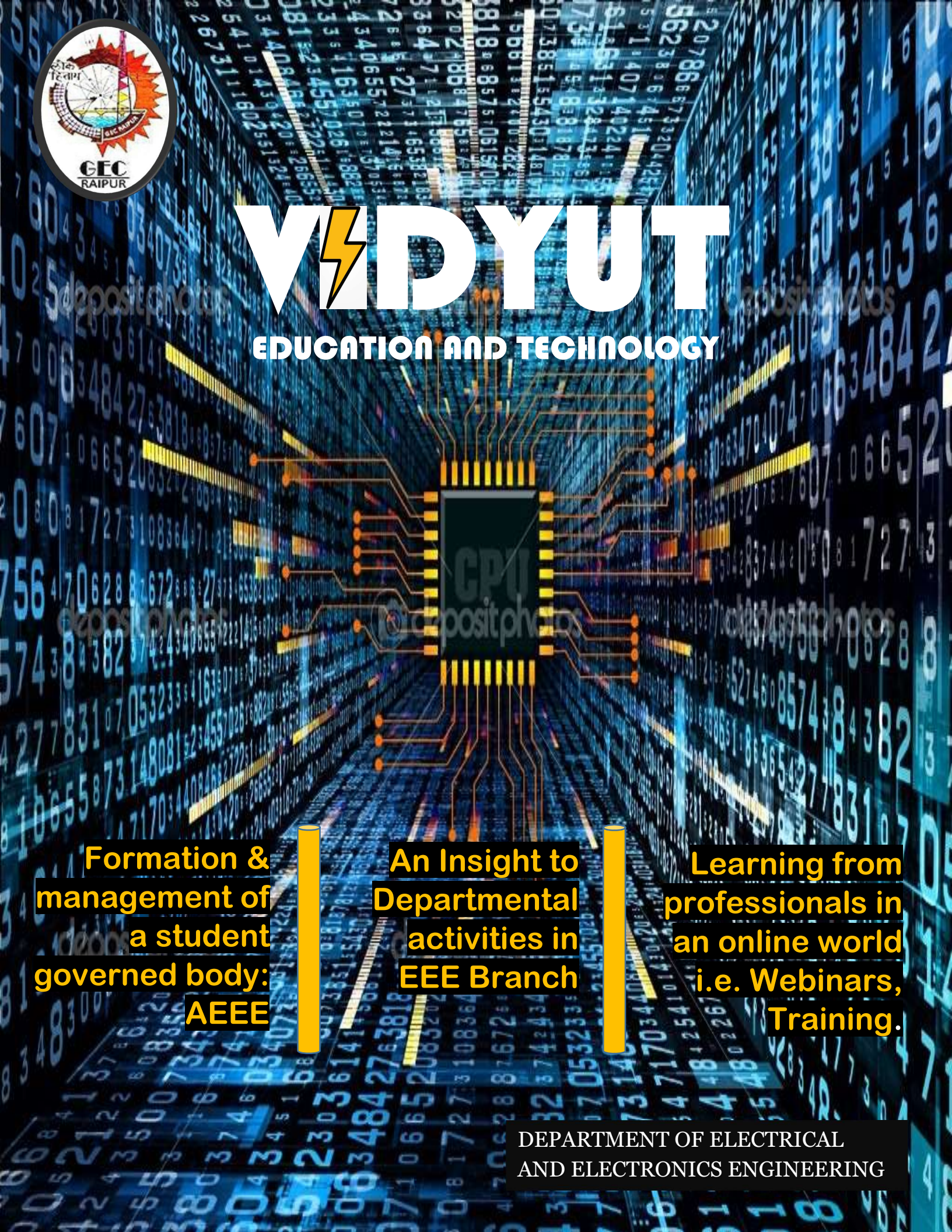

GEC
RAIPUR
VIDYUT
EDUCATION AND TECHNOLOGY
Formation & management of a student governed body: AEEE
An Insight to Departmental activities in EEE Branch
Learning from professionals in an online world i.e. Webinars, Training.
DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

# CONTENT



## DEPARTMENTAL ACTIVITIES

# Vision & Mission

## Vision

To be a center of excellence in the field of Electrical & Electronics Engineering and prepare proficient Engineers with ethical values for sustainable development of the nation.

## Mission

• MD1: Impart core fundamental knowledge, skills, creativity for higher education and future career prospects through innovative teaching learning methodology.

• MD2: Prepare socially responsible Engineers to serve the future needs and challenges of the society.

• MD3: Create a platform for research oriented activities with the help of industrial collaborations.

## PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

PEO1: Graduates will have effective problem solving skills to analyze, design and provide innovative solutions using fundamental engineering principles and modern tools.

PEO2: Graduates will contribute successfully to the society as professionals having high moral conduct and adaptable to changing trends through lifelong learning.

PEO3: Graduates will possess the qualities of leadership, teamwork, effective communication and self-learning for working in diverse fields adhering to their social and ethical responsibilities.

# PROGRAM SPECIFIC OUTCOMES (PSOs)

PSO1: Graduand will be able to apply core concepts of electrical engineering for the purpose of design, installation, operation, control, testing and maintenance of electrical equipment's and systems.

PSO2: Graduand will be able to undergo research and development activities with the help of hardware- software co-design.

# PROGRAM OUTCOMES (POs):

• PO1: Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex electrical engineering problems.

• PO2: Problem analysis: Identify, formulate, review research literature, and analyze complex electrical engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

• PO3: Design/development of solutions: Design solutions for complex electrical engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

• PO4: Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

• PO5: Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex electrical engineering activities with an understanding of the limitations.

• PO6: The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

• PO7: Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

• PO8: Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

• PO9: Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

• PO10: Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

• PO11: Project management and finance: Demonstrate knowledge and understanding of the electrical and electronics engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

• PO12: Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.


# WEBINARS

*Association of Electrical and Electronics Engineering (AEEE) organized a series of online seminars in this uncertain environment with the objective of continuing the flow of knowledge using the tool of online interaction.*

## Power Systems Switchgear and applications

19-08-2020

Conducted by the CEO of Universal Power Control of Karnataka, Mr. Bhasavesh Shetty Doddabele, this Webinar primarily focused on the composition of Power Systems Switchgear and its applications**.** Switchgear is used both to de-energize equipment to allow work to be done and to clear faults downstream. This type of equipment is directly linked to the reliability of the electricity supply. This informative Webinar ended with Mr. Shetty clearing the doubts of our curious students.

## Fuzzy Logic Controller application on power system

25-08-2020

This Webinar was delivered by Dr. Vasundhara Mahajan who is an Associate Professor from SVNIT, Surat in Electrical Department. Dr. Vasundhara highlighted the importance of the Fuzzy Logic Controller and its increasing applications in today's electrical sector. This Webinar was successfully conducted with major focus being laid on the various applications of Fuzzy Logic Controller which are Contingency analysis, Diagnosis/monitoring , Distribution planning , Load frequency control , Generator maintenance scheduling , Generation dispatch , Load flow computations , Load forecasting , Load management , Reactive power/voltage control Security assessment , Stabilization control (PSS) , Unit commitment.

## Microgrid Stability definition, analysis and examples

26-08-2020

Microgrid is a decentralized group of electricity sources and loads that normally operates connected to and synchronous with the traditional wide area synchronous grid (macrogrid), but can also disconnect to "island mode" and function autonomously as physical or economic conditions dictate. This Topic of discussion was conducted by Dr. Tapan Prakash (Assistant Professor, VIT Vellore) and it constituted of really useful content which made the students understand the benefits of microgrid.

## Renewable energy based electric power generation with MPPT

28-08-2020

Our AEEE Team invited Dr. Neeraj Priyadarshi (Principal, Chandil Polytechnic, Jharkhand) for conducting this online seminar. Beginning with the common technologies based on Renewable energy, Dr. Neeraj went on to dive deep into the fundamentals of MPPT and its principle of operation. The renewable energy technologies explained in the session also included Energy harnessing technologies and Grid strengthening technologies.

## Advanced Power Electronic Converters for Electric Vehicle

30-08-2020

A Clearly Structured Session was led by Dr. Raveendhra Dogga who is the Founder of Zunik Technologies. Throughout the whole webinar Dr. Raveendhra stressed on the Integrated Power Electronics Interface (IPEI) for Battery Electric Vehicles (BEVs) in order to optimize the performance of the electric vehicle. At the end of this session, he answered the Queries asked by the students with great courtesy.

## An intelligent protection schemes for micro-grid with DGs

31-08-2020

Protection system schemes have increasingly become important due to the increasing complexity and challenges in power systems. An Introductory seminar on the topic really turned out to be helpful for the students. Dr. Anamika Yadav (Associate Professor, NIT Raipur) conducted this webinar. More in-depth exploration led to the discussion on Artificial intelligence (AI) and related technologies which are effective in solving complex system controls and decision problems.

## Resume Building

01-09-2020

Resume writing is important for making the transition from school to the workforce. When you're in learning mode, you're focused on the theory that underlies the kind of work you're interested in. However, once you complete your education, you must focus on the practical application of your skills. Taking this fact into account, AEEE team invited Mr Avnish Tiwari who is a Developer (Darwin Box, Hyderabad) and also a brilliant alumnus of GEC Raipur. Mr. Avnish delivered this commendable session in an engaging manner. The tips and instructions given by him regarding Resume Building will definitely come in handy in near future for the attendees.

## Power Quality Improvement

02-09-2020

A seminar on Power Quality Improvement was delivered by Dr. T. A. Naidu (Assistant Professor, NIT Andhra Pradesh). Power quality is a combination of voltage profile, frequency profile, harmonics of contain and reliability of power supply. The degree to which the power supply approaches the ideal case of stable, uninterrupted, zero distortion and disturbance free supply. Voltage sags, voltage surge, transient, harmonics, lighting these are the typical power quality problems.

## Recent Trends in Solar Energy Sector

03-09-2020

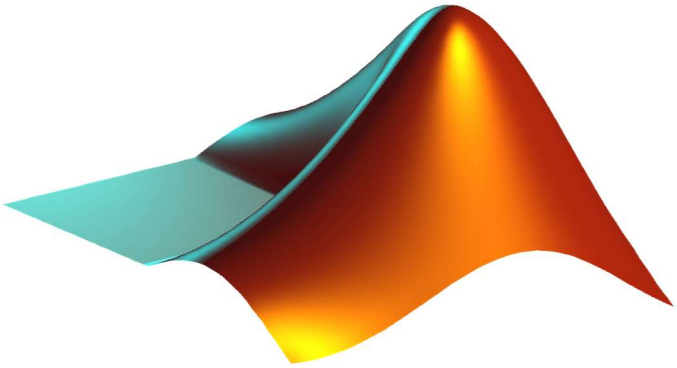
Led by the Technical Director of Lukrative Solar Solutions, Mr. Chandrashekhar Chandraker., this session revolved around the latest trends of solar energy technology. Mr. Chandrashekhar put more insight into how it can help businesses stay competitive in 2020 and in future years. He also elaborated the use of machine learning and Artificial Intelligence (AI) - One trend to look for in emerging solar energy technology solutions.

## Overview of MATLAB

20-09-2020

With Dr. R. N. Patel (Associate Professor, NIT Raipur) as its speaker, this seminar started with the introduction of MATLAB and then continued with the thorough exploration of the subject. This session was very informative and helpful for the students as many engineering disciplines rely on MATLAB to ensure that the results of any design process or new theory involving electrical circuits or

network make sense.



## Applications of wavelet transform and its variants in Protection and Transmission Lines

05-12-2020

This Webinar was conducted by Dr. Anamika Yadav (Associate Professor, NIT Raipur). The Wavelet Transform theory has received great importance in the last years on the Power System analysis because multi-resolution presents properties good for the transient signal analysis. The speaker's interactive way of explanation made the topic easily understandable for the students.

## Electrical Contractor and Switchgear Applications

07-12-2020

An Interactive Session was organized by Dr. Basavesh Shetty Doddabele, who is the CEO of Universal Power Controls. The Content brought by Dr. Shetty on the topic was absolutely apt. The major focus was drawn on the basic functions of the Switchgear along with the detailed explanation of Electrical contractor.

## Recent Development in Electrical Engineering

09-12-2020

The Webinar on Recent Development in Electrical Engineering witnessed great participation. It was conducted by Dr. V Sandeep, the Assistant Professor of Electrical Engineering Department from NIT Andhra Pradesh. The Session comprised of well-structured explanation of latest tech-advancements related to Robotics, Electrical Vehicles, Wireless Charging, Smart Grid, Super capacitors, Modern Irrigation System and Automation.

## Need of power quality and different aspects of power quality improvement in distribution system

09-12-2020

A session on the topic of Need of Power Quality and different aspects of power quality improvement in distribution systems was delivered by Dr T. A. Naidu, Assistant Professor (EED, NIT, AP). During the seminar, Dr Naidu stressed on the various aspects of power quality improvement in distribution system such as Active Power Filters (APF) ( Shunt active power filter, series active power filter (SAPF)), passive Power Filters, Hybrid active power filters, Dynamic Voltage Restorer (DVR), Automatic Voltage Regulator (AVR), DSTATCOM, UPS, Smart impedance, Electrical

springs , Multifunctional DGs, Control methods of MFRESs, Current control method , voltage control method and Hybrid control method.

## Implementation of solar energy in Industrial sector

10-12-2020

Conducted by the Technical Director of Lukrative Solar Solutions, Mr. Chandrashekhar Chandraker, this session was majorly concentrated on the idea that **Solar Energy is the Need of Hour**. Mr Chandraker put more insight on the usage of solar energy in industrial sectors like Hot water or steam demand process, drying and dehydration process, preheating, concentration, washing, cleaning, chemical reaction, Industrial space heating, textile, plastic, chemistry, business establishments and many more.

## Overview of Exchange Power in electricity market

10-12-2020

An informative seminar on 'Overview of Exchange Power in electricity market' was led by Er Rohit Gupta, Assistant Manager of Power Exchange Limited, Mumbai. Mr Rohit included recent marketing statistics in the session and also carried an analytical approach throughout the webinar. In economic terms, electricity is a commodity capable of being bought, sold, and traded. An electricity market, also power exchange or PX, is a system enabling purchases, through bids to buy; sales, through offers to sell; and short-term trading, generally in the form of financial or obligation swaps. At the end of the webinar speaker responded to all the queries asked by the students.

## Scope and Job opportunities in solar voltaic systems

11-12-2020

This Webinar was led by Dr. Himanshu Sharma who is the HOD of EEE from SRM Institute of Technology and Science, Delhi, NCR. During the seminar, He highlighted the the wide scope and large job opportunities in solar voltaic systems such as solar installer or solar panel installer. Solar photovoltaic installers hold about 12,000 jobs .The largest employers of solar photovoltaic installers includes Electrical contractors and other wiring installation contractors (35%), Plumbing, heating, and air-conditioning contractors (33%), Self-employed workers (6%) and Utilities (5%).

## Ethics in Engineering education

12-12-2020

The rules and standards which govern the conduct of engineers in their role as professionals. Engineering ethics are similar to general ethics, but apply to the specific issues which affect engineering professionals. Engineering ethics is the study of moral issues and decisions confronting individuals and organizations engaged in engineering. The study of related questions about moral ideals, character, policies and relationship of people and corporations involved in technological activity. Dr. K. Subramaniam (Retd Indian Forest Service Officer) led this seminar and his content on the subject was significant to tap the knowledge of the participants.


## Webinar Series Drafted By:

DEEPAK KUMAR

(NGEC RPR - EEE- IV SEM)

# STUDENT REVIEWS

I am very much thankful to AEEE for introducing webinar series which was fun-learning. All the webinars were engaging throughout the lockdown and boosted my interest towards oscilloscopes. Looking forward to more amazing events in near future.

DITIYA MUKHERJEE

(NGEC RPR - EEE - VII SEM)

This is the first time I have attended webinars in this format and wondered how effective it would be. It was very effective and therefore I would definitely be interested in attending other webinars in the same format. The instructors had a profound knowledge of the Subjects in matter and provided a wealth of information about the current industrial requirements.

ARUNANSHU SHUKLA

(NGEC RPR - EEE- V SEM)

Thank you so much AEEE for organizing this webinar series. I utilized my time well throughout the webinar, especially during the lockdown. All the topics covered in the webinar series was really helpful for me. Special thanks to all the speakers. I would like to see more such webinars being held in the future.

DEEPA GUPTA

(NGEC RPR - EEE- V SEM)

# FACULTY DEVELOPMENT PROGRAMME

Faculty Development Programme (FDP) is a skill development program specially designed for academic educators. It focuses on current and emerging teaching-learning methodologies/ technologies to motivate the faculty towards professional excellence and satisfaction. A typical FDP will be of three days in duration. More than 180 professors from all over the country came out as participants. A similar program on the topic "Renewable Energy for Sustainable Development: Opportunities & Challenges" was organized from September 8th to 12th, 2020. Experts from IIT, NIT, and Various reputed University's took panel session covering various topics such as

- Vision towards Smart Grid
- Fuel cells for Energy Management Applications
- Comparative Analysis of different MPPT Tracking Technologies
- Multiple Input Converter for Integration of Solar PV Panel
- Discussion on Recent Advanced Topologies of Solar PV System
- Islanding Detection Schemes for Distributed Generator in Microgrid
- Application of Renewable Energy Systems in improving power quality of distribution system
- Power Quality Problem associated with renewable energy interface


# BIS QUIZ

World Standards Day is celebrated every year on 14th October to commemorate the efforts made by Scientists, Technologists and other subject experts who have shared their knowledge and experience to enable the development of National and International Standards. The celebration is jointly organized by the International Organization for Standardization (ISO), International Electro-technical Commission (IEC) and International Telecommunication Union (ITU). Every year, these organizations jointly propose a theme for the World Standards Day. For this year, the theme was "Protecting the Planet with Standards". The competition was held on 21st October.

**EEE DEPARTMENT (BIS QUIZ) RESULTS:**

BIS Quiz witnessed exemplary participation from EEE branch and among those below are the ones who emerged as winners:

- Essay writing competition on the Topic ***"Role of Technology towards making a better planet".***

1. Prakashini divya (V Sem)
2. Nishant Prasad (III Sem)
3. Soumya Chandrakar (V Sem)

- Poster Competition on the Topic ***"Preparing the Planet for a safe future"***

1. Mohit Kumar Gupta (V Sem)
2. Manish Joshi (VII Sem)

- Slogan Competition on the Topic ***"Using Technology for protecting the planet"***

1. Manish Chandrakar (III Sem)
2. Manish Joshi (VII Sem)
3. Nishant Prasad (III Sem)

# Vocational Training

Vocational training (VT) is described as training that emphasizes knowledge and skills needed for a specific trade, craft or job function.

Earlier, this training was confined to certain trades like welding, automotive services, and carpentry but the horizon of vocational training has expanded with the evolution of time. Today, a wide range of job functions including various fields of Engineering studies are also being included under this category.

Vocational training basically focuses on practical applications of the skills learned or acquired and it provides the much needed hands-on instruction in a specific trade. It works as a connecting link between theoretical education and the real working environment and, students can join these types of programs at the school level or post-secondary level as well.

Department of Electrical and Electronics Engineering collaborated with **CIPET, MSME and Jayswal Neco Industries Ltd.** to offer students a well-structured VT on the following Subjects:

- Course Name: Advanced Electrical Machine Maintenance (Online Skill Training)
  - Conducting Organization: Central Institute of Plastics Engineering & Technology (CIPET)
  - Duration: 31/08/2020- 25/09/2020
  - Participants: 15

- Course Name: Electrical Hardware Control and E-CAD (Online Skill Training)
  - Conducting Organization: Ministry of Micro, Small & Medium Enterprises (MSME, Govt. of India)
  - Duration: 31/08/2020- 30/09/2020
  - Participants: 41

- Course Name: Industry Adoption and Readiness (Digital Internship)
  - Conducting Organization: Jayswal NECO Industries Limited
  - Duration: 04/08/2020- 17/08/2020
  - Participants: 76

# GATE 2021 Results

The Graduate Aptitude Test in Engineering (GATE) is a computer-based standardized test conducted at the national level in India with an aim to examine the understanding of various engineering and science undergraduate subjects. Qualifying in the GATE exam is a mandatory requirement for the engineering graduates who are seeking admissions and/or financial assistance to the Postgraduate Programs like Master's and Doctoral with the Ministry of Education (MoE) and other Government Scholarships / Assistantships that are subject to the admission criteria's of the institutes.GATE exam results are also used by some of the Public Sector Undertakings (PSUs) for their recruitment procedure.

Some of our bright students who have qualified GATE 2021 are:

- Amartya Singh
- Megha Chandrakar
- Akash Singh
- Dheeraj Agrawal
- Kashish Jain
- Ankit Awasthy
- Veena bhuarya
- Kamlesh Verma

# TED TALKS

A TED Talk is a showcase for speakers presenting great, well-formed ideas in a short span of time. Those well-formed ideas can be either a new and surprising idea or invention or a great basic idea with a compelling new argument behind it that challenges beliefs and perspectives. Such Tech- demos were organized by AEEE for our students witnessing great speakers:

- Shri Ramanuj Sharma (Renowned Chhattisgarhi Actor, Padma Shri Award Winner)
- Mr. Pradip Shukla (Art of Living)
- Mr. Harish Sadija (Art of Living)
- Mr. Anuj Sharma (Indian Idol)
- Dr. Sana Memon (Masterchef)

# AEEE

## Association of Electrical and Electronics Engineering

aeeengecr.com

Association of Electrical and Electronics Engineering, GEC Raipur is a non-profit independent student-governed body which aims the overall development with a motive to build an exhaustive resource pool to aid potential student through various events.

It was initiated by successful efforts of two students of the branch, **Mr Satyam Sinha (Batch-2016)** and **Mr Himanshu Sahu (Batch-2016).** Their primary concern behind the formation of a student body was to provide industrial exposure to the students along with necessary technical skills required in Engineers. Considering the rising role of engineering ethics in industries, the initiators of the association decided that the academic education is not sufficient for industrial adoption. As an Engineering students we must focus on our essential skills such as analytical ability, critical thinking, management, creativity, structural analysis and many more. Taking this factor into account, the initiators inaugurated the association with the support of departmental staffs on **26th February, 2020**.

The Organizational Structure of AEEE consists of The President at its head, currently appointed as Mr Manish Pratap Singh Joshi and then coming down to the hierarchy, we have The Vice President and Secretary Mr Priyank Sahu and Ms. Shreenidhi Pudipeddi respectively who are elected by the students via an online election. The further members have been categorised into teams namely, Public Relations, Management Team, Technical Team, Designing Team, Creative Team, Sports Team, Cultural Team, Website Team and also Anchors and hosts.

AEEE has conducted plethora of events ranging from technical workshops and webinar series to expert interaction from various fields encouraging students to imbibe prudent personality traits, collaborative spirit and effective communication being two of them. The Association is planning to conduct more such events and workshops in order to continue this non-academic approach of learning in an online mode, considering the second wave of ongoing pandemic.

# AEEE: ORGANISATIONAL STRUCTURE

## Faculty in Charge

Professor Rishabh Gaurav

**President**

Mr. Manish Joshi

**Vice President**

Mr. Priyank Sahu

**Secretary**

Ms. Shreenidhi Pudipeddi

**Treasurer**

Mr. Dheeraj Agrawal

---

**Technical Team**

Ms. Ditiya Mukherjee (HEAD)

Mr. Tanmay Karmakar

Mr. Rohit Singh

**Anchoring Team**

Ms. Jahnvi Srivastava (HEAD)

Ms. Shikha Dhar

Ms. Deepa Gupta

Mr. Advaita Upadhyay

Ms. Yashaswi Agrawal

Ms. Prachi Sahu

**Certification Team**

Ms. Prachi Sahu (HEAD)

Mr. Amartya Sharma (HEAD)

Mr. Saurabh Kushwaha

**Website Team**

Mr. Aman Upadhyay (HEAD)

Ms. Kriti Shrivastava

Ms. Akanksha Bhagat

Mr. Himanshu Yadu

**Documentation Team**

Mr. Amar Tolani (HEAD)

Ms. Anisha Paul

Ms. Shreenidhi Pudipeddi

**Promotion Team**

Mr. Amar Tolani (HEAD)

Mr. Arunanshu Shukla

**Social Media Team**

Mr. Arunanshu Shukla (HEAD)

Mr. Priyank Sahu

# AEEE NGECR PRESENTS...

Miss Poorva Sharma
(HOD,EEE)

Miss Dewashri Pansari
(Assistant professor)

Mr. Saurabh Gupta
(Assistant professor)

Mr. Praveen Kumar Mishra
( Assistant professor)

Mr. Rishabh Gaurav
( Assistant professor)

Mr. Ashiwani Yadav
(Assistant professor)

Mr. Vikas Kumar Mishra
( Assistant professor)

Mr. Ishwar Singh Chandra
(Assistant professor)

Mr. Parimal
Assistant professor)

Mr. Abhay Shukla
(Assistant professor)

Mrs. Pratibha Tripathi
(Assistant professor)

Miss Priyanka kumari
(Assistant professor)

Miss Sweta Agrawal
(Assistant professor)

Mr. Jawahar Bhukhia
(Assistant professor)

*Live Interactive Session Between Professors And Students....*

# ADIÓS

## CORE 2019-20

Whatever you all do it will be the best. Its not for the others its for the development of ourselves And connect with the entire college for mutual exchange of knowledge and skills. All the best and keep it up.

मैं AEEE के जरिये नए लोगो से मिला उनसे बात किया and I found this is the best way of interaction to your peers , jnr and senior इवेंट का script तैयार करना ,समय के दबाव में काम करना Thanks for the all experiences AEEE

It was quite challanging to participate in building the team & Perform task. Members had Great Enthusiasm, Motivation, Innovative Minds and management Skills .i enjoyed the Leadership Role of Many Task Thanks to Our Faculties, Colleagues & Fantastic Juniors & I wish for the glorious future of "AEEE".

started with very few people but लोग साथ आते गए और कारवां बनता गया. Working in the association was fun and full of learnings at the same time. AEEE will always hold a special place in my heart.

Lots of love and good wishes.

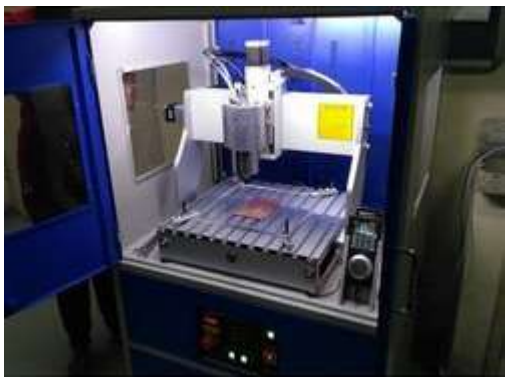
Journey of AEEE began with some bright EEE juniors and colleagues. Experience of working with AEEE was a great honour, although things couldn't go in our way due to this pandemic, but came out with excellent results. "there is no limitations to the mind except those we acknowledge".

It Was A Great Learning With AEEE Team. Everyone Do Your Best For The Upliftment Of the AEEE Association and GECR In All The Fields.

It was so unfortunate that we couldn't find the time to know each other in our department during the college hours, but unknowningly we have Served together, Rejoiced together which made us united. This platform added good moments to my college days.

Best wishes to all the AEEE Family to achieve more success,versatility for AEEE.

It was amazing to be a part of anchor team of AEEE. I believe the upcoming generation is supreme and will do better in the upliftment of our club. Thankyou everyone for this wonderful experience.



# PCB Prototype Machine

*Engineers designing printed circuit boards (PCBs) commonly to generate a prototype board prior to full-scale manufacturing of boards for end products. Multiple prototype runs will often be included in the development of the final fabricated PCB, for good reason.*

The Department recently purchased the new PCB Prototype machine for laboratory use. The PCBMATE 300 watts Prototype & Antenna fabrication machine is used to make a prototype PCB board. We can make Engraving, Hatching, Milling, Drilling, and Cutting using this machine. In this machine tools are changed by manual only. It's available in two various communication modes (Parallel port / USB mode). This machine is controlled by the CNC controller with Mach3 CNC software. This Machine will be beneficial for the students during their minor and major project work and it will also serve its purpose in research related activities. The complete specifications of this machine is mentioned in the below table.

| SPECIFICATION | ETS - PCBMATE® 300W |
|---|---|
| PCB Prototyping & Antenna fabrication System | Manual |
| Software | Copper CAM & Mach3 Mill |
| Resolution (X/Y) | 3.125 Micro Meter |
| Working Area (X/Y/Z)(mm) | 200x300x120 mm |
| Minimum Width Line & Space in mm | 0.1 (4 mil) |
| Max Travel Speed (mm/sec) | 58 (2.28 “) |
| Drilling (mm) | 0.2 -3.175 (8-125 mil) |
| Maximum Drilling Cycles/ Min | 50 |
| Main Axle Power Rate | 300 W |
| Main Axle Rotating Speed | 25000 RPM |
| Max working speed | 3500mm/min |
| Feeding Height | 120 mm |
| Working drive | 0.02-0.05mm |
| Repositioning accuracy | 0.01-0.02mm |
| Supported format | Standard Gerber, DXF, Excellon |
| Capability of Processing various materials | FR4, Copper clad, Acrylic, Metal, Aluminum and etc., |
| Power | 220 V AC |
| Weight | 52 Kg |

# AUTOMATIC HAND SANITIZER DISPENSER

The emergence of the novel virus, SARS-CoV-2, has posed unprecedented challenges to public health around the world. Currently, strategies and vaccination to deal with COVID-19 are purely supportive and preventative, aimed at reducing transmission. An effective and simple method for reducing transmission of infections in public or healthcare settings is hand hygiene. When hand washing with soap and water is unavailable, a sufficient volume of

sanitizer is necessary to ensure complete hand coverage, and compliance is critical for appropriate hand hygiene. Most alcohol-based hand sanitizers are effective at inactivating enveloped viruses, including coronaviruses. With this very fact in mind, the students of EEE Branch made a project on Automatic Hand Sanitizer Dispenser.

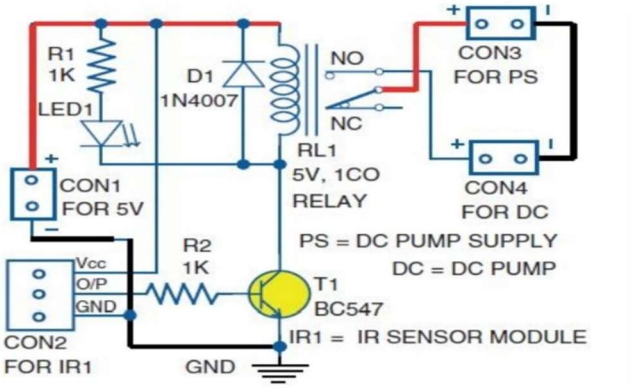
This Sanitizer Dispenser Module is a low cost module. It consumes very less current. The functioning is such that, the sensor, Solenoid Valve, Buzzer, and adapter needs to be connected to the module. Now, the module will detect the hand from 6 inches away and turn ON the solenoid valve.

After 200 ms, the solenoid and buzzer will be turned OFF automatically, and further triggers will be disabled until the hand is taken away and placed again. This Sanitizer works on an IR Sensor. The module takes 12 VDC from an adapter as INPUT, via a DC Jack. And the ultra-sonic sensor can be connected to this module using a 4 Pin JST XH Connector. It also has 12V interface for connecting Buzzer and Solenoid Valve which is switched via a Relay.

**Supplies:**

- PCB
- IC LM358.
- IC base (8 pin).IR LED.10 KΩ resistor - 2
- 330 ohm resistor - 3
- Screw Terminal - 2
- 3MM LED - 2
- 6V DC Submersible Pump.
- 9V Power Supply

presence of hands and consequently activates the motor pump to dispense alcohol- based sanitizer. The circuit is economical, reliable, and can be easily constructed, as explained below.




# Purpose of the project

Our initial point of contact with germs is often from the hands. Unfortunately, not many people wash or maintain basic hygiene of their hands. Over the time people have started emphasizing more and more on maintaining personal cleanliness and hygiene. And the best way to keep viruses and bacteria at bay is, of course, by frequent hand washing. Using a sanitizer dispenser for this reduces your chances of getting sick in your inevitable daily interactions with people and germs. Hand sanitizer dispenser also is handy in water- scarce areas.

This project is based on an infrared (IR) sensor, which detects the


**EEE - VII SEM Students:**

Naresh Kiran
Bhanupriya Bhaskar

Umeshwari Koliyare
Deepika Netam

# Workshop

## On Oscilloscope and Function Generator Designing

A workshop on oscilloscope and function generator designing was organized by the Department of Electrical and Electronics Engineering. The programme was targeted towards students as well as faculties of the Electrical Engineering stream. The workshop provided a complete and brief idea about the challenges faced by the electrical engineers in terms of the importance of Oscilloscope and its industrial aspects as well as a learning opportunity in the field of Function Generator Designing.

The workshop was graced by sessions from a bright alumnus of our College Mr Hitesh Chandrakar (Batch-2013). The content of the Workshop was systematically divided in 13 Sessions held from 7th May, 2020 to 19th May, 2020. Mr. Hitesh delivered intensive sessions on the various outlooks of the Function Generator Designing and industrial demands in view of the Oscilloscope in both the technical and laymen's terms.

The workshop was aimed towards indoctrinating the students, of mainly Electrical engineering, so as to enlighten them with some 'behind the scenes' situations of Generator designing as well as the very essential role of a designer in an industry. The attendees were acquainted with some vital and key details of the oscilloscope which generally doesn't fall under the syllabus of Practical Laboratory. From the view of a rookie, the workshop introduced a whole new spectrum in terms of career and future prospects. The students got to assimilate about the concepts of designing and the responsibilities and the challenges associated with the work of applied research.

As the topic is based on electronics, it sure consisted of some derivations which was made easily understandable by the mathematical approach of the speaker. After the end of each session, the Speaker used to respond to the queries of the attendees along with providing online support material for more in-depth exploration of the topics.

# GLOBAL OUTLOOK EV 2020

## Entering the Decade of Electrical Drive?

Source: IEA

(International Energy Agency)

The Global EV Outlook is an annual publication that identifies and discusses recent developments in electric mobility across the globe. It is developed with the support of the members of the Electric Vehicles Initiative (EVI). Generally, EV Outlook combines the historical analysis with future projections, the report examines key areas of interest such as electric vehicle and charging infrastructure deployment, ownership cost, energy use, carbon dioxide emissions and battery material demand.

The Global edition published by IEA also features an update on the performance and costs of batteries. It further extends the life cycle analysis conducted in Global EV Outlook 2019, assessing the technologies and policies that will be needed to ensure that EV battery end-of-life treatment contributes to the fullest extent to sustainability and CO2 emissions reductions

objectives. Finally, it analyses how off-peak electricity demand charging, dynamic controlled charging (V1G) and vehicle-to-grid (V2G) could mitigate the impact of EVs on peak demand, facilitate the integration of variable renewables and reduce electricity generation capacity needs.

The edition also featured case studies on transit bus electrification in **Kolkata (India)**, Shenzhen (China), Santiago (Chile) and Helsinki (Finland). The report includes policy recommendations that incorporate learning from frontrunner markets to inform policy makers and stakeholders that consider policy frameworks and market systems for electric vehicle adoption.

*In this report, we have made efforts to highlight the key points of the Global Outlook EV 2020 including the environmental objectives and government policies.*

# Global sales of passenger cars were sluggish in 2019, but electric cars had another banner year

Sales of electric cars topped 2.1 million globally in 2019, surpassing 2018 – already a record year – to boost the stock to 7.2 million electric cars. Electric cars, which accounted for 2.6% of global car sales and about 1% of global car stock in 2019, registered a 40% year-on-year increase. As technological progress in the electrification of two/three-wheelers, buses, and trucks advances and the market for them grows, electric vehicles are expanding significantly. Ambitious policy announcements have been critical in stimulating the electric-vehicle rollout in major vehicle markets in recent years. In 2019, indications of a continuing shift from direct subsidies to policy approaches that rely more on regulatory and other structural measures – including zero-emission vehicles mandates and fuel economy standards – have set clear, long-term signals to the auto industry and consumers that support the transition in an economically sustainable manner for governments.

After entering commercial markets in the first half of the decade, electric car sales have soared. Only about 17 000 electric cars were on the world's roads in 2010. By 2019, that number had swelled to 7.2 million, 47% of which were in The People's Republic of China ("China"). Nine countries had more than 100 000 electric cars on the road. At least 20 countries reached market shares above 1%.

The 2.1 million electric car sales in 2019 represent a 6% growth from the previous year, down from year-on-year sales growth at least above 30% since 2016. Three underlying reasons explain this trend:

- Car markets contracted. Total passenger car sales volumes were depressed in 2019 in many key countries. In the 2010s, fast-growing markets such as China and India for all types of vehicles had lower sales in 2019 than in 2018. Against this backdrop of sluggish sales in 2019, the 2.6% market share of electric cars in worldwide car sales constitutes a record. In particular, China (at 4.9%) and Europe (at 3.5%) achieved new records in electric vehicle market share in 2019.
- Purchase subsidies were reduced in key markets. China cut electric car purchase subsidies by about half in 2019 (as part of a gradual phase out of direct incentives set out in 2016). The US federal tax credit programme ran out for key electric vehicle

automakers such as General Motors and Tesla (the tax credit is applicable up to a 200 000 sales cap per automaker). These actions contributed to a significant drop in electric car sales in China in the second half of 2019, and a 10% drop in the United States over the year. With 90% of global electric car sales concentrated in China, Europe and the United States, this affected global sales and overshadowed the notable 50% sales increase in Europe in 2019, thus slowing the growth trend.

- Consumer expectations of further technology improvements and new models. Today's consumer profile in the electric car market is evolving from early adopters and technophile purchasers to mass adoption. Significant improvements in technology and a wider variety of electric car models on offer have stimulated consumer purchase decisions. The 2018-19 versions of some common electric car models display a battery energy density that is 20-100% higher than were their counterparts in 2012. Further, battery costs have decreased by more than 85% since 2010. The delivery of new mass-market models such as the Tesla Model 3 caused a spike in sales in 2018 in key markets such as the United States. Automakers have announced a diversified menu of electric cars, many of which are expected in 2020 or 2021. For the next five years, automakers have announced plans to release another 200 new electric car models, many of which are in the popular sport utility vehicle market segment. As improvements in technical performance and cost reductions continue, consumers are placed in the position of being attracted to a product but wondering if it would be wise to wait for the "latest and greatest model".

*The Covid-19 pandemic will affect global electric vehicle markets, although to a lesser extent than it will the overall passenger car market. Based on car sales data during January to April 2020, our current estimate is that the passenger car market will contract by 15% over the year relative to 2019, while electric sales for passenger and commercial light-duty vehicles will remain broadly at 2019 levels. Second waves of the pandemic and slower-than-expected economic recovery could lead to different outcomes, as well as to strategies for automakers to cope with regulatory standards. Overall, we estimate that electric car sales will account for about 3% of global car sales in 2020. This outlook is underpinned by supporting policies, particularly in China and Europe. Both markets have national and local subsidy schemes in place – China recently extended its subsidy scheme until 2022. China and Europe also recently strengthened and extended their New Energy Vehicle mandate and CO2 emissions standards, respectively. Finally, there are signals that recovery measures to tackle the Covid-19 crisis will continue to focus on vehicle efficiency in general and electrification in particular.*

# Environmental and sustainability objectives drive electric vehicle policy support at all governance levels

Electric vehicles are a key technology to reduce air pollution in densely populated areas and a promising option to contribute to energy diversification and greenhouse gas emissions reduction objectives. Electric vehicle benefits include zero tailpipe emissions, better efficiency than internal combustion engine vehicles and large potential for greenhouse gas emissions reductions when coupled with a low-carbon electricity sector. These objectives are major drivers behind countries' policy support in the development and deployment of electric powertrains for transport. To date, 17 countries have announced 100% zero-emission vehicle targets or the phase-out of internal combustion engine vehicles through 2050. France, in December 2019, was the first country to put this intention into law, with a 2040 timeframe.

Policy actions for electric vehicles depend on the status of the electric vehicle market or technology. Setting vehicle and charger standards are prerequisites for wide electric vehicle adoption. In the early stages of deployment, public procurement schemes (e.g. for buses and municipal vehicles) have the double benefit of demonstrating the technology to the public and providing the opportunity for public authorities to lead by example. Importantly, they also allow the industry to produce and deliver bulk orders to foster economies of scale. Emerging economies can scale up their policy efforts for both new vehicles and second-hand imports.

Tax rates that reflect tailpipe $CO_2$ emissions can be conducive to increased electric vehicle uptake. Fiscal incentives at the vehicle purchase, as well as complementary measures (e.g. road toll rebates and low-emission zones) are pivotal to attract consumers and businesses to choose the electric option. Local governments are key in proposing and implementing measures to enhance the value proposition of electric vehicles. The use of local low- and zero-emission zones can steer car purchase decisions far beyond just those zones and may influence the relative resale value of internal combustion engines and electric powertrains.

The vast majority of car markets offer some form of subsidy or tax reduction for the purchase of an individual or company electric car as well as support schemes for deploying charging infrastructure. Provisions in building codes to encourage charging facilities and the "EV-readiness" of buildings are becoming more common. So too are mandates to build charging infrastructure along road corridors and fuel stations.

# Policies are being tailored to support market transition

There is common understanding that government support for electric vehicle purchases can only be transitional, as sale volumes increase. In the near term, a point will be reached when technology learning and economies of scale will have driven down the purchase cost of electric vehicles and mass-market adoption is triggered. For the first time a decrease in government spending for electric car purchase incentives was observed in 2019, while both consumer spending and total expenditure on electric cars continued to increase. At the national level, both China and the United States witnessed substantial purchase subsidies reductions or partial phase out in 2019, but there are cases where these reductions were met by increases in local government support. In China the central government was planning in 2019 to culminate a phase-out that dates to 2016, though, in the face of bleak electric car sales in the second half of 2019, the subsidy scheme was extended through 2022. Yet some other countries extended or implemented new purchase incentives schemes in 2019 or early 2020, for example, Germany and Italy.

Shifts to a variety of regulatory and fiscal measures are likely to gradually become a main driver of electric vehicle deployment, setting clear goals and a long-term vision for the industry. Many of the regulatory policies impel vehicle makers to sell a greater number or share of electric or otherwise more efficient vehicles. For example, today 60% of global car sales are covered by China's New Energy Vehicle mandate, the European Union CO2 emissions standard (which is applicable to all EU member states) or a zero-emission vehicle mandate (in selected US states and Canadian provinces). The European Union approved a new fuel economy standard for cars and vans for 2021 30 and a CO2 emissions standard for heavy-duty vehicles (2020 30), with specific requirements or bonuses for electric vehicles. In the European Union, 2020 is the target year for compliance with the CO2 emissions standards for light- duty vehicles of 95 grammes of CO2 per kilometre, which has contributed to the successful uptake of electric light-duty vehicles in Europe in recent years. In 2019, China announced a tightening of its New Energy Vehicle mandate scheme with both setting new credit targets for 2021-23 and a more stringent calculation method for the credits beyond 2021. These actions are in step with its planned gradual transition from direct to more indirect forms of subsidies and incentives (including increasing support for charging infrastructure and other support

services). In the United States, regulatory developments were different from other markets; the Safer Affordable Fuel-Efficient (SAFE) vehicles final rule, put in place in March 2020, replaced the 2012 rule, lowering the annual improvement in fuel economy standards from 4.7% in the 2012 rulemaking to 1.5% in SAFE for model years 2021 through 2026.

*Policies are being tailored to support market transition*

| Range of credits per vehicle | | | | |
|---|---|---|---|---|
| Year | BEV | PHEV | FCEV | NEV credit targets |
| Until 2020 | 1-5 | 2 | 1-5 | 2019: 10%, 2020: 12% |
| From 2021 | 1-3.4 | 1.6 | 1-6 | 2021: 14%, 2022: 16%, 2023: 18% |

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# 'A Word from the Faculty Advisor'

*It gives me immense pleasure to announce that the newsletter for the Year 2020-21 is being published. It is an excellent medium to communicate the happenings of Electrical & Electronics Engineering department as well as showcasing the talents of the students in the department. Past one year has been a very tough and challenging year due to COVID-19, but still with the collective efforts of all the students, faculty members and staff, we have seen some big achievements last year which includes the organization of about 19 webinars, formation of AEEE, organization of an FDP on Renewable Energy and excellent performance of our students in GATE 2021. It is a matter of great pride that the department is making rapid progress in enhancing its potential. I thank, appreciate and congratulate the editorial team for putting a lot effort for doing the excellent job of issuing the newsletter. The times may be tough but together we can always make a difference. I would like to conclude by sharing a famous quote, "When educating the minds of our youth, we must not forget to educate their hearts".*

**Faculty Advisor**

Professor Poorva Sharma

Head of the Department, Dept. of EEE

NGECR, Raipur (C.G.)

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# ‘A Word from The Editor’

*I deem it a great honor and privilege to receive the opportunity of editing the departmental Newsletter. I was passionate about collecting information regarding the wide variety of events conducted throughout the year. I have been a participant and have volunteered in many departmental activities. So, when I got the chance to edit Volume 2 of the Newsletter, I tried my best efforts to compile all the educational events in a synchronized manner and put them in this Newsletter in a clearly structured form. All the work required in this Newsletter including Content Collection and Writing, Content drafting, designing and editing seemed like an arduous undertaking for me, only when I realized that I have got the mentorship of the immensely knowledgeable and diligent Faculty advisor, Professor Poorva Sharma. Having an opportunity to learn from her has made a substantial change in crafting this Newsletter and thus I extend my Vote of thanks to her.*

**ADVAITA UPADHYAY**

(NGEC RPR - EEE - VI SEM)

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EDUCATION AND TECHNOLOGY

# 'A Word from The Editor'

*I am very thankful for the opportunity I received to be a part of the editorial team of the departmental newsletter along with my senior.*
*I like organizing and compiling content for general documentations and here I got to utilize the same skill for drafting the content of the webinar series for this particular newsletter. I also gathered a lot of knowledge while organizing the data for this newsletter. This was my first time volunteering for a departmental activity and it turned out to be a great learning experience, especially because of the support of our Faculty Advisor and guidance from my senior. Overall for me, this work has been very interesting, enjoyable and wonderful for which I am wholeheartedly thankful to our Respected and Honorable Professor Poorva Sharma.*

**DEEPAK KUMAR**

(NGEC RPR - EEE- IV SEM)