# Gyan Ganga

Institute of Technology & Sciences
Jabalpur (M.P.)

GYAN GANGA
GROUP OF INSTITUTIONS
*Committed for Excellence*

# ELEXA

## Volume 5

***Department of Electrical & Electronics Engineering***

GYAN GANGA
GROUP OF INSTITUTIONS
Committed for Excellence

# PREFACE

The Department of Electrical and Electronics has recorded consistent improvement in its academic, research, and placement performance. Department offers a range of innovatively designed programmes that's curricular are constantly updated to meet the changing requirements of the industry and also meet the needs of major stakeholders.

When publishing these newsletters and magazine, the only thing we had in mind was that they should reflect the outlook of the department in all aspects. Hereby, we, the editors, take the responsibility of ensuring the continuity of the issues in the years to come with improvements and richness every time. We are pretty sure that you will get a lot of useful information from it.

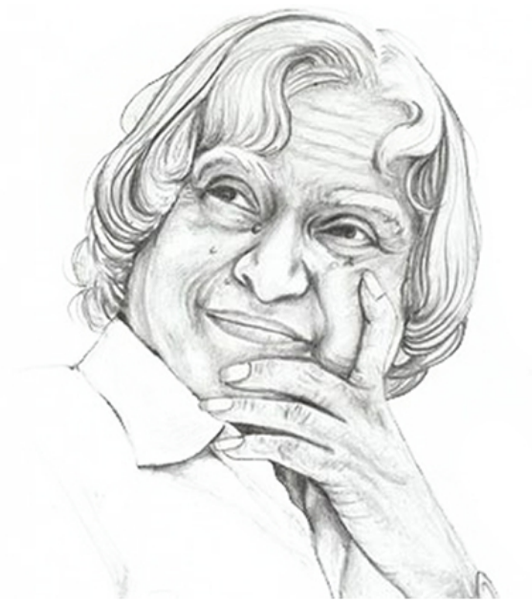
The department publishes the following newsletters and technical magazines. The departmental newsletter has four issues in a year; issue 1 publishes in the month of September, issue 2 publishes in the month of December, issue 3 publishes in the month of March, and issue 4 publishes in the month of June. Technical Magazine publishes one per year, i.e., in June of every year. The editorial board for both is common; there are four student members (one from each semester) and three faculty members on the editorial board.

GYAN GANGA
GROUP OF INSTITUTIONS
Committed for Excellence

# लड़ना मत छोड़ो

तब तक लड़ना मत छोड़ो
जब तक अपनी तय की हुई
जगह पर न पहुँच जाओं
यही अद्वितीय हो तुम।
जिन्दगी में एक लक्ष्य रखो
लगातार ज्ञान प्राप्त करों
कड़ी मेहनत करो, और
महान जीवन को प्राप्त करने
के लिए दृढ़ रहो।

**डॉ. ए पी जे अब्दुल कलाम**



GYAN GANGA
GROUP OF INSTITUTIONS
Committed for Excellence

# EDITORIAL

## FROM CHAIRMAN DESK

It is with immense pride and enthusiasm that I address you on the occasion of the release of the technical magazine of the Electrical & Electronics Engineering department. This publication serves as a beacon, illuminating the remarkable accomplishments, the pioneering research, and the boundless potential within our academic community.

Within the pages of this magazine, you will encounter a mosaic of ideas, discoveries, and innovations that reflect the collective spirit of our department. Each article, each project, and each contribution resonates with the unwavering commitment to excellence that defines Electrical & Electronics Engineering.

As we embrace the ever-evolving landscape of technology, it's imperative that we acknowledge the transformative role that knowledge dissemination and academic collaboration play. This magazine not only showcases the outstanding work of our faculty and students but also underlines the collaborative synergy that fuels our successes.

I extend my heartfelt gratitude to the contributors, the editorial team, and all those who have poured their expertise and passion into this publication. Your dedication to pushing boundaries, exploring the unknown, and inspiring others is a testament to the spirit of innovation that we hold dear.

I invite you all to immerse yourselves in the magazine's content, to explore the narratives of progress and the stories of visionaries. Let this magazine inspire you to continue pushing the envelope, to continue seeking breakthroughs, and to continue shaping the landscape of Electrical & Electronics Engineering.

Thank you for your dedication, your contributions, and your role in making our academic community a hub of creativity, excellence, and transformative thinking.

**Er D. C. Jain**

GYAN GANGA
GROUP OF INSTITUTIONS
Committed for Excellence

## FROM SECRETARY DESK

It is a pleasure to address you as the College Secretary on the occasion of the release of the technical magazine of the Electrical & Electronics Engineering department. This publication stands as a testament to the collaborative efforts, boundless creativity, and unwavering commitment that define our academic community.

The magazine's pages encapsulate the spirit of exploration and innovation that thrives within our department. Each article, research paper, and project showcases the dedication and expertise of our faculty and students, pushing the boundaries of what's possible in the realm of Electrical & Electronics Engineering.

Behind the scenes, there are countless hours of coordination, organization, and teamwork that contribute to the realization of this magazine. As the College Secretary, I have had the privilege of witnessing the intricate web of efforts that come together to create such an inspiring publication.

I extend my heartfelt gratitude to everyone involved in bringing this magazine to life – the contributors, the editorial team, and all those who play a part in showcasing the brilliance of our department. Your dedication to sharing knowledge and fostering an environment of excellence is truly commendable.

I encourage you all to explore the magazine's contents, to immerse yourselves in the narratives of innovation and achievement. Let these stories serve as a reminder of the impact that can be achieved through collaborative effort and a shared passion for learning.

Thank you for your contributions, for your commitment to advancing our field, and for being an integral part of the remarkable journey that is Electrical & Electronics Engineering.

**Dr. RAJNEET JAIN**

GYAN GANGA
GROUP OF INSTITUTIONS
Committed for Excellence

## FROM EXECUTIVE DIRECTOR DESK

It is with great pride and excitement that I extend my warmest greetings on the occasion of the launch of the technical magazine of the Electrical & Electronics Engineering department. This publication stands as a beacon of innovation, a testament to the collaborative spirit, and a tribute to the transformative power of knowledge.

Within the pages of this magazine, you will discover a wealth of ideas, research breakthroughs, and creative projects that embody the spirit of exploration and advancement. Each article, each contribution, and every insight is a testament to the relentless pursuit of excellence that defines Electrical & Electronics Engineering.

As we navigate the ever-evolving landscape of technology and education, it is essential to recognize the pivotal role that leadership and vision play in driving progress. This magazine not only celebrates the achievements of our students and faculty but also underscores the guidance, support, and strategic thinking that shape our academic journey.

I extend my heartfelt gratitude to all contributors, the editorial team, and everyone who has poured their expertise and passion into this publication. Your dedication to pushing boundaries, fostering collaboration, and inspiring innovation is truly commendable.

I invite you all to immerse yourselves in the magazine's contents, to explore the narratives of progress, research discoveries, and visionary ideas. Let this magazine serve as a reminder that every effort, every exploration, and every insight contributes to the advancement of our field and the enrichment of our collective knowledge.

Thank you for your unwavering commitment, your passion for education, and your instrumental role in guiding our academic community towards a future illuminated by innovation and excellence.

**Mr. PANKAJ GOYAL**

GYAN GANGA
GROUP OF INSTITUTIONS
Committed for Excellence

## FROM EXECUTIVE DIRECTOR DESK

It brings me great joy and pride to address you on the launch of the technical magazine of the Electrical & Electronics Engineering department. As the College Treasurer, I understand the vital role that financial support plays in nurturing innovation and driving progress in our academic community.

In the pages of this magazine, you'll find a treasure trove of ideas, insights, and discoveries that highlight the cutting-edge work being done within the department. From groundbreaking research to ingenious projects, each contribution represents a step forward in the world of Electrical & Electronics Engineering.

Behind the scenes, our financial investments in infrastructure, resources, and research grants lay the foundation for these achievements. As we embrace the transformative power of technology, we must acknowledge that sound financial stewardship is integral to our journey towards excellence.

I extend my heartfelt gratitude to the faculty, students, and contributors who have poured their expertise and passion into this publication. Your dedication to advancing knowledge and sharing it with our community is truly commendable.

I encourage everyone to delve into the magazine's pages, absorbing the stories of progress and inspiration. Let these stories motivate you to continue pushing boundaries and seeking new horizons within your academic pursuits.

Thank you for your unwavering commitment to innovation, for your contributions, and for being a part of the incredible journey that Electrical & Electronics Engineering offers.

**Er. APURVA SINGHAI**

GYAN GANGA
GROUP OF INSTITUTIONS
Committed for Excellence

## FROM EXECUTIVE DIRECTOR DESK

It is an honor to convey my thoughts as a College Executive Member on the occasion of the release of the technical magazine of the Electrical & Electronics Engineering department. This magazine is not just a publication; it is a testament to the dedication, intellect, and unyielding passion that define our academic community.

Through the pages of this magazine, you will delve into a world of ideas, discoveries, and accomplishments that showcase the dynamism of our department. Each article, each research piece, and every contribution reflects the spirit of curiosity and the drive for excellence that characterizes Electrical & Electronics Engineering.

Behind this publication lies the efforts of numerous individuals who have worked tirelessly to bring these ideas to light. As an Executive Member, I've had the privilege of witnessing the collaborative spirit and the sense of purpose that our department embodies.

I want to express my heartfelt gratitude to all contributors, the editorial team, and everyone who has played a role in making this magazine a reality. Your commitment to sharing knowledge, sparking innovation, and fostering intellectual growth is truly commendable.

I encourage you all to immerse yourselves in the magazine's pages, to absorb the stories of progress, breakthroughs, and vision. Let this magazine serve as a reminder of the transformative power of education and the profound impact that our collective efforts can have on the world of Electrical & Electronics Engineering.

Thank you for your contributions, your dedication, and your continuous pursuit of excellence. It's your enthusiasm and determination that make our academic community thrive.

**Er. VISHESH JAIN**

GYAN GANGA
GROUP OF INSTITUTIONS
Committed for Excellence

## FROM PRINCIPAL DESK

It is with immense pride and excitement that I extend my warm greetings on the launch of the technical magazine of the Electrical & Electronics Engineering department. This publication stands as a testament to the relentless pursuit of excellence, the spirit of exploration, and the boundless creativity that define our academic community.

The pages of this magazine hold a treasure trove of ideas, discoveries, and accomplishments that echo the vibrancy of our department. Each article, each research endeavor, and every contribution reflects the intellectual fervor and the quest for innovation that characterize Electrical & Electronics Engineering.

As we navigate the dynamic landscape of technology and education, it is paramount that we acknowledge the transformative role that knowledge dissemination and academic collaboration play. This magazine not only celebrates the achievements of our students and faculty but also underscores the collective spirit that drives our progress.

I extend my heartfelt appreciation to all the contributors, the editorial team, and everyone who has dedicated their time and expertise to create this publication. Your commitment to fostering a culture of inquiry, pushing boundaries, and inspiring others is truly commendable.

I invite you all to immerse yourselves in the magazine's contents, to engage with the stories of accomplishment, breakthroughs, and ingenuity. Let this magazine serve as a reminder that every thought, every innovation, and every endeavor contributes to shaping the landscape of Electrical & Electronics Engineering.

Thank you for your contributions, your passion, and your dedication to shaping the future of our field. It is your enthusiasm and drive that make our academic community a thriving hub of inspiration and progress.

**Dr. R V Kshirsagar**

GYAN GANGA
GROUP OF INSTITUTIONS
Committed for Excellence

## FROM DIRECTOR IQAC DESK

It is with great pleasure and pride that I address you on the launch of the technical magazine of the Electrical & Electronics Engineering department. This publication is a testament to the unwavering commitment to quality, the spirit of continuous improvement, and the pursuit of excellence that define our academic community.

Within the pages of this magazine, you will encounter a rich tapestry of ideas, research endeavors, and pioneering projects that reflect the ethos of our department. Each article, each contribution, and every insight symbolize the dedication to knowledge, innovation, and growth that characterize Electrical & Electronics Engineering.

As we uphold the principles of quality enhancement and academic excellence, it is crucial to acknowledge the transformative role that knowledge dissemination and sharing play. This magazine not only celebrates the accomplishments of our faculty and students but also highlights the collaborative efforts that underlie our success.

I extend my heartfelt gratitude to all contributors, the editorial team, and everyone who has contributed to this publication. Your commitment to fostering a culture of continuous improvement, pursuing excellence, and sharing insights is truly commendable.

I invite you all to explore the magazine's contents, to engage with the stories of progress, research breakthroughs, and transformative ideas. Let this magazine serve as a reminder that every endeavor, every discovery, and every advancement contributes to the advancement of Electrical & Electronics Engineering and beyond.

Thank you for your dedication, your passion for learning, and your role in making our academic community a hub of continuous improvement and academic excellence.

**Dr D. V. S. BHAGWANULU**

GYAN GANGA
GROUP OF INSTITUTIONS
Committed for Excellence

## FROM HOD DESK

It is with immense pride and enthusiasm that I address you on the release of the technical magazine of the Electrical & Electronics Engineering department. This publication serves as a testament to the intellectual fervor, the collaborative spirit, and the unyielding dedication that define our academic community.

Within the pages of this magazine lies a tapestry of ideas, research endeavors, and innovative projects that mirror the essence of our department. Each article, each contribution, and every insight exemplify the commitment to exploration, technical prowess, and scholarly pursuit that characterize Electrical & Electronics Engineering.

As we navigate the ever-evolving landscape of technology and education, it's paramount to recognize the pivotal role that academic leadership and mentorship play. This magazine not only celebrates the achievements of our students and faculty but also underscores the guidance, support, and vision that shape our progress.

I extend my heartfelt gratitude to all contributors, the editorial team, and everyone who has dedicated their time and expertise to make this publication a reality. Your dedication to fostering an environment of innovation, pushing boundaries, and nurturing academic growth is truly commendable.

I invite you all to immerse yourselves in the magazine's contents, to explore the narratives of progress, research breakthroughs, and visionary thinking. Let this magazine serve as a reminder that every endeavor, every discovery, and every insight contributes to the advancement of our field and to the shaping of our collective journey.

Thank you for your unwavering dedication, your passion for education, and your instrumental role in making our academic community a hub of inspiration and technical brilliance.

**Dr. RUCHI PANDEY**

## Editorial Message

Dear Readers and Enthusiasts,

Welcome to the latest edition of our department's technical magazine, an endeavor that exemplifies the essence of exploration, innovation, and academic excellence within the realm of Electrical & Electronics Engineering.

In a world where technology evolves at a rapid pace, this magazine serves as a compass, guiding us through the myriad advancements, breakthroughs, and discoveries that shape our field. Each article, research paper, and project showcased within these pages is a testament to the curiosity, intellect, and dedication that define our academic community.

As we embark on this journey of discovery, we invite you to immerse yourselves in the narratives of innovation that unfold. From pioneering research that expands the boundaries of knowledge to creative projects that embody the practical applications of theory, you'll find a wealth of insights that inspire and captivate.

Our department thrives on collaboration, where the expertise of faculty, the passion of students, and the support of our academic leadership converge to create an environment conducive to progress. This magazine is a celebration of the collective achievements, the collaborative spirit, and the boundless potential that our field offers.

I extend my gratitude to the contributors for their invaluable insights and the editorial team for their meticulous efforts in bringing this publication to fruition. It is through your dedication that we are able to capture the essence of our department's intellectual journey.

As you delve into the pages of this magazine, I hope you are inspired by the transformative power of knowledge and the possibilities that lie ahead. May the stories shared here kindle your curiosity, ignite your creativity, and encourage you to continue pushing the frontiers of Electrical & Electronics Engineering.

Thank you for embarking on this exploration with us. Your curiosity, your enthusiasm, and your commitment to advancing our field make this endeavor truly remarkable.

**Editorial board**
**Dr. Ruchi Pandey**
**Prof. Shalini Vaishya**
**Prof. Ashok Soni**

## MISSION AND VISION OF THE INSTITUTE

### Vision of Institution:

Initially to seek autonomy and eventually grow the Institute into a renowned University by:

- Imparting the best technical and professional education to the students of the Institute.
- Developing all the Departments of the Institute as Centers of Excellence.
- Creating the most congenial and cordial environment of Teaching, Learning and Research in the Institute.
- Conceiving world – class Education, Ethics and Employability for students in global perspective.

### Mission of Institution:

To explore and ensure the best environment to transform students into creative, knowledgeable, principled engineers and managers compatible with their abilities in ever- changing socio- economic and competitive scenario by :

- Imparting intensive teaching and training through latest technology
- Motivating the teachers for higher learning and innovative research activities with social services.
- Generating maximum opportunities for placement of students in National, Multi-National companies and nurturing entrepreneurship quality.
- Producing highly intellectual citizens through technical education to constitute an elegant society and meeting social challenges.

## MISSION AND VISION OF THE DEPARTMENT

### Vision of Department:

"The Department of Electrical and Electronics Engineering aims to achieve excellence by providing high quality teaching and learning process, inculcating ethical and moral values, innovation and research to produce skilled technocrats to meet the needs of the society."

### Mission of Department:

The Department aims to realize the Vision through the following Mission by:

- Providing a quality engineering education by implementation of latest technologies and processes.
- Creating opportunities to carry out research and innovation and understand the importance of lifelong learning.
- Organizing student centric programs, trainings and make them employable in national and multinational organizations.
- Preparing them to be successful engineers and train them to provide sustainable solutions to the industry and society.

GYAN GANGA
GROUP OF INSTITUTIONS
Committed for Excellence

# ARTIFICIAL INTELLIGENCE TECHNIQUES IN ENERGY EFFICIENCY

**Prof (Dr.) Ruchi Pandey**
**HOD (Department Of Electrical & Electronics Engineering)**

Artificial intelligence techniques are increasingly being used to improve energy efficiency in a variety of applications. These techniques leverage machine learning algorithms to optimize energy consumption, reduce waste, and improve the performance of energy systems. Here are a few examples:

- Predictive Maintenance: Machine learning algorithms can be used to predict when equipment failures are likely to occur, allowing maintenance teams to address issues before they result in energy waste or equipment downtime. This approach can help to reduce maintenance costs, extend the lifespan of equipment, and improve the reliability of energy systems.
- Energy Management Systems: Machine learning algorithms can be used to optimize the performance of energy management systems, such as HVAC, lighting, and building automation systems. These algorithms can analyze data from sensors and other sources to adjust settings in real-time, minimizing energy consumption and reducing waste.
- Load Forecasting: Machine learning algorithms can be used to forecast energy demand, allowing utilities to adjust production and distribution in real-time. This can help to reduce the need for expensive peaking power plants and improve the efficiency of energy distribution systems.
- Energy Auditing: Machine learning algorithms can be used to analyze energy consumption patterns and identify areas for improvement. This can help businesses and organizations to identify energy-saving opportunities and prioritize investments in energy efficiency.
- Energy Storage Optimization: Machine learning algorithms can be used to optimize the use of energy storage systems, such as batteries and flywheels. By predicting power demand and adjusting the use of stored energy accordingly, these algorithms can help to improve the efficiency and reliability of energy storage systems.
- Overall, artificial intelligence techniques are becoming increasingly important in the field of energy efficiency. By leveraging machine learning algorithms, organizations can optimize energy consumption, reduce waste, and improve the performance of energy systems, leading to significant cost savings and environmental benefits.

GYAN GANGA
GROUP OF INSTITUTIONS
Committed for Excellence

# EV (ELECTRIC VEHICLE INDUSTRY): EXPONENTIAL GROWTH IN PAST DECADE IN INDIA

**Ashok Soni**
**Assistant professor**
**Department Of Electrical &Electronics Engineering**

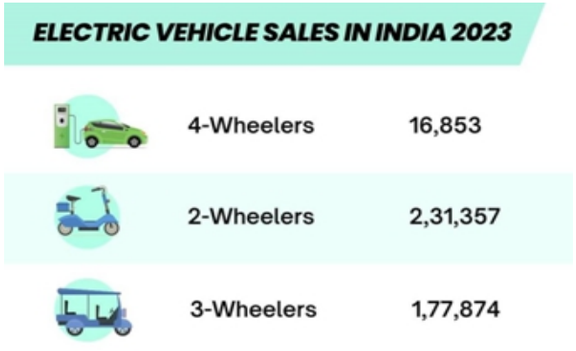
Electric vehicles are a type of transportation that use electricity stored in rechargeable batteries to power an electric motor and propel the vehicle. They have gained significant attention and popularity due to their potential to reduce greenhouse gas emissions and dependence on fossil fuels. Here are some key points about electric vehicles: Electric vehicles are the key technology to decarbonise road transport, a sector that accounts for around one-sixth of global emissions. Ambitious policies continue to be critical to growth in electric vehicle markets worldwide. If the EV sales growth experienced in recent years is sustained, CO2 emissions from cars can be put on a path in line with the Net Zero Emissions by 2050 Scenario.

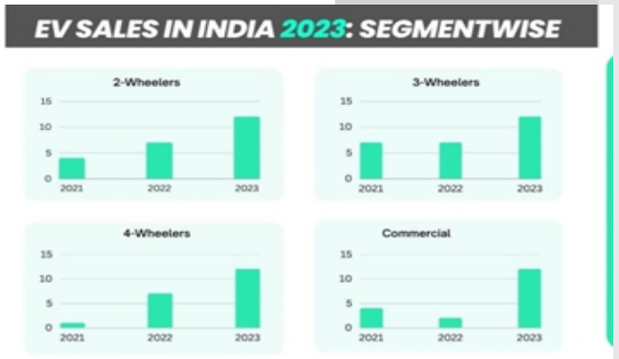
Advantages of Electric Vehicles:

- Environmental Benefits
- Lower Operating Costs:
- Energy Efficiency:
- Quiet Operation:
- Incentives:

Electric vehicle enthusiasts in India have welcomed electric vehicles with open arms, as the recent report by the Ministry of Power shows that over 20 lakh electric cars have been sold in the country in just six years of EV adoption. Electric vehicle sales in India are on the rise after the launch of friendly GOI policies and subsidies. Indian EV sector witnessed a growth of 200% in electric vehicle sales in 2022 compared to 2021 by selling 1 Lakh units. With 57,447 automobiles registered in the first month of the year, 2023 promises to be an even better year for the Indian EV sector.

Here we show the some data to show sales of EV (2 Wheeler, 3 Wheeler, 4 Wheeler & commercial) of last some years:




GROWTH OF THE INDIAN EV INDUSTRY: HOW EV SALES HAVE ACCELERATED OVER 10 YEARS

| Year | 2-wheelers | 3-wheelers | 4-wheelers | Buses | Goods carriers | Total | YoY growth (%) |
|---|---|---|---|---|---|---|---|
| 2013 | 1,989 | 36 | 374 | 1 | 43 | 2,443 | |
| 2014 | 1,678 | 12 | 481 | 3 | 20 | 2,194 | -10.19% |
| 2015 | 1,454 | 5,399 | 678 | 3 | 19 | 7,553 | 244.25% |
| 2016 | 1,459 | 46,561 | 621 | 4 | 54 | 48,699 | 544.76% |
| 2017 | 1,523 | 82,238 | 820 | 17 | 533 | 85,131 | 74.81% |
| 2018 | 16,572 | 1,08,289 | 988 | 49 | 657 | 1,26,555 | 48.65% |
| 2019 | 29,756 | 1,31,375 | 847 | 468 | 53 | 1,62,499 | 28.40% |
| 2020 | 28,632 | 88,227 | 3,179 | 88 | 13 | 1,20,139 | -26.06% |
| 2021 | 1,53,523 | 1,53,679 | 12,112 | 1,177 | 1,084 | 3,21,575 | 167.66% |
| 2022 | 6,22,337 | 3,37,335 | 37,792 | 1,932 | 453 | 9,99,849 | 211.00% |
| Total | 8,58,923 | 9,53,151 | 52,898 | 3742 | 2,929 | 18,76,637 | |

*Data: Vahan*

GYAN GANGA
GROUP OF INSTITUTIONS
Committed for Excellence

# THE ROLE OF AI IN ENERGY CONSUMPTION, MANAGEMENT AND NEW REVENUES

**Amit Gupta**
**Assistant professor**
**Department Of Electrical &Electronics Engineering**

Artificial intelligence (AI) and energy-saving features can help CSPs reduce energy consumption and operating costs. Here we explore the benefits of AI for sustainable networks – and why connecting all site equipment to the management system is key for energy efficiency and unlocking new revenues.

With advanced network design and optimization services, AI is already making a big impact on energy performance in hardware and software. When it comes to network design, the functionalities are centered on planning – using different AI models to give communication service providers (CSPs) a deeper understanding of the network and its users, enabling them to build with precision. Every network and site is unique, so it's important for energy-efficient solutions (such as Ericsson's 5G radio access network (RAN) portfolio) to provide a wide range of products adapted to each radio site's needs.

CSPs want to deploy sites – and services – where the customer demand is. With AI insights, they can identify which locations 5G sites, new carrier additions or other resources should be deployed, so they can be used where they will be most efficient.

Network optimization services, however, represent the area with the biggest impact. As we described in a recent Ericsson Technology Review article on AI and ensuring energy-efficient networks, AI predictions – coupled with energy-saving functionalities – can make vital decisions based on the network's needs. They can decide what resources will be needed in the coming hours and if all the capacity in the frequency bands within the Radio Access Network (RAN) will be needed during that time. They can then dynamically turn off or on different frequency bands or resources according to upcoming demand, saving energy when demand is low.

As discussed in the Breaking the Energy Curve report mentioned earlier, the RAN, with its active and passive equipment, accounts for over 75 percent of the overall energy consumption in mobile networks. Consequently, these types of services can have a significant impact not only on the sustainability of a CSP's operations, but also on their bottom line.

# APPLICATIONS OF AI IN ELECTRICAL & ELECTRONICS ENGINEERING

**Anand Goswami**
**Assistant professor**
**Department Of Electrical &Electronics Engineering**

AI has a wide range of applications in the field of Electrical and Electronics Engineering, revolutionizing the way systems are designed, operated, and optimized. Here are some key areas where AI is making a significant impact:

**1) Power Systems and Grid Management**

- Load Forecasting: AI can predict electricity demand, helping utilities optimize power generation and distribution.
- Fault Detection and Diagnosis: AI algorithms can identify faults in power systems, aiding in quick responses and maintenance.
- Optimal Operation: AI can optimize the operation of power plants, managing factors like fuel consumption, emissions, and cost.

**2) Smart Grids**

- Demand Response: AI enables smart grids to respond to fluctuations in electricity demand, optimizing energy consumption and reducing peak loads.
- Distributed Energy Resources (DER) Management: AI can manage renewable energy sources like solar panels and wind turbines for efficient integration into the grid.

**3) Renewable Energy**

- Solar Panel Efficiency: AI can predict solar irradiance and optimize the orientation of solar panels for maximum energy generation.
- Wind Turbine Control: AI algorithms adjust the pitch and yaw of wind turbine blades for optimal energy capture.

**4) Control Systems**

- Process Control: AI can optimize industrial processes by analyzing data and adjusting control parameters in real time.
- Adaptive Control: AI can adjust control strategies based on changing conditions, enhancing system stability and performance.

**5) Electronic Design Automation (EDA)**

- Chip Design: AI aids in designing and optimizing integrated circuits, improving efficiency and reducing design time.
- PCB Design: AI can assist in designing and routing printed circuit boards for better signal integrity and thermal management.

**6) Signal Processing**

- Image and Speech Recognition: AI can be used to interpret and process images and audio signals, enabling applications like image analysis and voice-controlled systems.
- Digital Filtering: AI algorithms enhance the quality of signals by removing noise and unwanted artifacts.

**7) Predictive Maintenance**

- Equipment Health Monitoring: AI analyzes sensor data to predict when electrical equipment might fail, enabling timely maintenance and reducing downtime.
- Condition-Based Monitoring: AI systems continuously assess the health of equipment,

**8) Robotics and Automation**

- Industrial Robots: AI-driven robots perform tasks with precision and adapt to changing conditions in manufacturing processes.
- Automated Inspection: AI-powered vision systems inspect electronic components and assemblies for defects.

**9) Energy Efficiency**

- Building Management Systems: AI optimizes energy usage in buildings by adjusting lighting, heating, and cooling based on occupancy and external conditions.
- Energy Auditing: AI identifies areas of energy wastage and recommends energy-saving measures.

**10) Communication Systems**

- Wireless Channel Optimization: AI algorithms adapt wireless communication parameters for optimal signal quality and coverage.
- Network Management: AI manages network resources, improving performance and reducing congestion.

These applications demonstrate how AI is transforming the Electrical and Electronics Engineering field, enhancing efficiency, sustainability, and overall system performance.

# THE ALTERNATIVE FUEL OF FUTURE

**RAKSHA PATLE (0206EX191032)**
**VIII Semester**
**Department Of Electrical &Electronics Engineering**

As of my last knowledge update in September 2021, several alternative fuels were being explored as potential candidates for the future of transportation and energy. It's important to note that developments in this field could have occurred since then. Here are some alternative fuels that were considered promising:

**Hydrogen:** Hydrogen fuel cells produce electricity by combining hydrogen and oxygen, emitting only water vapor as a byproduct. Hydrogen can be produced through various methods, including electrolysis powered by renewable energy sources. It has the potential to be a clean and efficient fuel for vehicles and stationary power applications.

**Biofuels:** Biofuels are derived from organic materials such as crops, agricultural waste, and algae. They can be used as a replacement for traditional fossil fuels in vehicles and power generation. Ethanol and biodiesel are common examples of biofuels. Advanced biofuels, such as cellulosic ethanol and algae-based fuels, aim to overcome some of the limitations of first-generation biofuels.

**Electricity:** Electric vehicles (EVs) are powered by electricity stored in batteries. The energy can be generated from renewable sources like solar, wind, and hydropower, making EVs a cleaner option compared to internal combustion engine vehicles. Charging infrastructure and battery technology are key areas of development for widespread adoption.

**Synthetic Fuels (eFuels):** Synthetic fuels, also known as electrofuels or eFuels, are produced by using renewable energy to generate hydrogen and combining it with carbon dioxide captured from the atmosphere. These fuels can be used in existing internal combustion engines without major modifications and have the potential to be carbon-neutral if produced using renewable energy sources.

**Natural Gas**: Compressed natural gas (CNG) and liquefied natural gas (LNG) are alternatives to gasoline and diesel. While natural gas is still a fossil fuel, it produces fewer emissions compared to traditional gasoline and diesel when burned. It can serve as a transitional alternative while cleaner technologies continue to develop.

**Methanol:** Methanol can be produced from various sources, including natural gas, biomass, and even carbon dioxide. It can be used as a transportation fuel or as a feedstock for producing other chemicals. Methanol fuel cells are also being explored as a potential power source.

**Ammonia**: Ammonia is another potential energy carrier that can be produced from renewable sources. It has a high energy density and can be stored and transported relatively easily. Ammonia can be used as a fuel for combustion engines or in fuel cells to generate electricity.

**LPG (Liquefied Petroleum Gas):** LPG is a mixture of propane and butane gases derived from natural gas processing and petroleum refining. It's a cleaner-burning alternative to gasoline and diesel and is widely used for heating, cooking, and transportation.

Remember that the feasibility and adoption of these alternative fuels depend on factors such as technological advancements, infrastructure development, economic viability, and government policies. It's recommended to check for more recent information to get an accurate picture of the latest developments in alternative fuels.

# SPEEDING UP RE GENERATION IS NECESSARY

**JIYA LAL CHARMKAR (0206EX201019)**
**VI Semester**
**Department Of Electrical &Electronics Engineering**

India is one of the countries that has taken up the Net Zero target very seriously. However, owing to several reasons, we are still behind. We need to focus more on decentralised Renewable Power (RE) generation… -

Whatever is the global situation and progress towards embracing the carbon emission-free era, India is creditably committed to achieve its target of 500 GW of renewable energy by 2030. The recently declared government's plan for the same has once again reiterated our keen interest to accelerate the journey towards achieving the net zero state. Our country's current total renewable energy capacity stands at ~168.96 GW (dated 28th February 2023) with about 82 GW at various stages of implementation and about 41 GW under tendering stage. This includes 64.38 GW Solar Power, 51.79 GW Hydro Power, 42.02 GW Wind Power and 10.77 GW Bio Power.

According to a recent report from Statista, China's solar energy consumption reached 330 TWh as of 2021. There the second largest development has taken place in the field of wind power. Their cumulative installed wind power capacity from 2014 to 2021 stood at 282 GW.

Obviously, we need to improve much. Although there is a little different reason behind China's development of vast solar capacity, i.e., the nation is one of the leading suppliers of solar modules globally. Thus, internally there the solar power developers are enjoying the benefits of economies of scale. So, more than looking at photovoltaic power generation from the angle of environmental improvement, they have been focusing on it from the business profitability angle.

**Our government's current plan:** The Government of India has recently decided to invite bids for 50 GW of renewable energy capacity annually for the next five years i.e., from Financial Year 2023-24 till Financial Year 2027-28. These annual bids of ISTS (Inter-State Transmission) connected renewable energy capacity will also include setting up of wind power capacity of at least 10 GW per annum.

The plan has recently been finalized by the Ministry of New & Renewable Energy (MNRE) at a meeting chaired by Union Minister for Power & NRE R. K. Singh. It is in accordance with the Prime Minister's announcement at COP26, of achieving 500 GW of installed electricity capacity from non-fossil fuel (Renewable Energy and Nuclear) sources by 2030.

**Time management :** Considering the fact that Renewable Energy (RE) projects take around 18-24 months for commissioning, the bid plan will add 250 GW of renewable energy and ensure 500 GW of installed capacity by 2030. The Ministry of Power is already working on upgrading and adding the transmission system capacity for evacuating 500 GW of electricity from non-fossil fuel. A detailed Plan titled, "Transmission System for Integration of over 500 GW RE Capacity by 2030" has been prepared in consultation with states and other stakeholders by the committee constituted under Chairperson, Central Electricity Authority by the Ministry of Power. The plan was launched on 7th December 2022. Also, under the Green Energy Corridor Project, Intra-State Transmission Systems are being created with financial support from Central Government.

**Conclusion :** Although it is estimated that on April 01, 2023, Indian population will exceed that of Chinese population, we are still far away from crossing their RE generation capacity. When we are planning to harness 500 GW of renewable energy (total) by 2030, in 2023 China is targeting to install ~ 95 GW to 120 GW new PV capacity (source: China Photovoltaic Industry Association, CPIA). Of course, it does not mean that we are not progressing, but we have to ramp up our RE capacity in an accelerated way. And one most important point is, we have to focus more on decentralised generation of RE power. Government cannot do everything, the citizens also have to share the responsibility.

# PLANNING A DIGITAL MARKETING CAMPAIGN

**ZOUKIA AKHTAR (0206EX211064)**
**IV Semester**
**Department Of Electrical &Electronics Engineering**

Digital marketing is the marketing of products or services using digital and any other digital medium. Digital marketing's development since the 1990s and 2000s has changed the way brands and businesses use technology for marketing. As digital platforms are increasingly incorporated into marketing plans and everyday life, and as people use digital devices instead of visiting physical shops, digital marketing campaigns are becoming more prevalent and efficient. Planning a digital marketing campaign requires careful strategizing and execution to achieve your goals effectively.

Here's a step-by-step guide to help you plan a successful digital marketing campaign:

1. **Set Clear Goals and Objectives**: Define what you want to achieve with your campaign. Are you aiming to increase brand awareness, generate leads, drive sales, or something else? Your goals should be specific, measurable, achievable, relevant, and time-bound (SMART).
2. **Know Your Target Audience**:Identify your target audience's demographics, interests, behaviors, and pain points. The better you understand your audience, the more personalized your campaign can be.
3. **Choose the Right Channels:** Based on your audience's preferences and behaviors, select the digital marketing channels that are most relevant. This could include social media, email marketing, search engines, content marketing, influencer partnerships, and more.
4. **Craft Compelling Content**: Develop high-quality and engaging content that resonates with your audience. This could include blog posts, videos, infographics, social media posts, webinars, and more.
5. **Optimize for SEO:** If your campaign involves content, make sure it's optimized for search engines. Use relevant keywords, optimize meta tags, and ensure your website's technical SEO is in good shape.
6. **Allocate Budget and Resources:** Determine how much you're willing to invest in your campaign. Allocate funds for advertising, content creation, design, and other necessary resources.
7. **Create a Content Calendar:** Plan the timing of your campaign and create a content calendar. This helps ensure a consistent flow of content across different channels.
8. **Leverage Social Media:** Develop a social media strategy to promote your campaign. Tailor your content for each platform and use appropriate hashtags, visuals, and engagement tactics.
9. **Email Marketing:** If applicable, set up an email marketing campaign. Craft engaging email content, segment your email list, and use automation to send targeted messages.

# EVENTS ORGANIZED BY THE DEPARTMENT

**Seminar**

- One day seminar on **"Control of plastic Waste and its management strategies for Environmental Sustainability"** Sponsored by MPCST Bhopal delivered by Dr Ajay Khare Scientist Pollution Control Board Jabalpur dated on 05/06/2023.


- Tree Plantation on the occasion of World Environment Day dated on 05/06/2023.

GYAN GANGA
GROUP OF INSTITUTIONS
Committed for Excellence

# ACHIEVEMENTS

## Paper Publication

- Dr Ruchi Pandey Published a Paper Topic **"A Review Of "Thermal Performance Analysis Of Parabolic Trough Solar Collectors Using Nano fluids**" on International Research Journal Of Modernization In Engineering Technology And Science, Volume : 05/Issue : 05 , E-ISSN: 2582-5208 Dated On May-2023.
- Dr Ruchi Pandey Published a Paper Topic **"Rational Of Energy Consumption Of Large – Scale Industries And Saving Opportunities"** on International Journal Of Emerging Technologies And Innovative Research (JETIR), Volume 9 Issue 11 , ISSN: 2349-6002 Dated On April 2023.
- Dr Ruchi Pandey Published a Paper Topic **"Harmonics – Causes, Affects & Mitigation Techniques"** on Journal Of Emerging Technologies and Innovative Research (Jetir) , Volume 10, Issue 4 ISSN-2349-5162 Dated On April 2023.
- Dr Rajeev Kumar Chauhan Published a Paper Topic **"Direct Load Control Scheme For Flexible Loads Under Automated Demand Response Program For Peak Demand Management, Loss Minimization, Asset Management, And Sustainable Development"** on Recent Advances In Electrical & Electronic Engineering, Journal Volume 16, Issue 5 ISSN (Print): 2352-0965 ISSN (Online): 2352-0973 dated on May-2023.
- Mr. Anand Goswami Published a Paper Topic **"Harmonics- Causes, Affects & Mitigation Techniques"** On Journal Of Emerging Technologies And Innovative Research (JETIR) , Vol 10 Issue 4 ISSN : 2349-5162 Dated On May 2023.
- Mr. Anand Goswami Published a Paper Topic **"Rational Of Energy Consumption Of Large-Scale Industries And Saving Opportunities"** on International Journal Of Innovative Research In Technology (IJIRT) , Volume 9 Issue 11 ISSN : 2349-6002 dated on Apr 2023
- Mrs. Parul Sharma Published a Paper Topic **"Electric Vehicles Charging System For Fast And Safe Charging Using LSTM Based Gradient Boosted Regression Tree"** on ICSCSS Will Be Held On 14-16, June 2023, In Hindusthan College Of Engineering And Technology (HICET) Coimbatore, India., ICSCSS – 245 dated on June,2023.
- Mr. Amit Gupta Published a Paper Topic **"Harmonics- Causes, Affects & Mitigation Techniques"** on Journal Of Emerging Technologies And Innovative Research (JETIR), Vol 10 Issue 4 ISSN 2349-5162 dated on Apr 2023.
- Mr. Amit Gupta Published a Paper Topic **"Rational Of Energy Consumption Of Large-Scale Industries And Saving Opportunities"** on International Journal Of Innovative Research In Technology(IJIRT) , Vol 9 Issue 11 ISSN 2349-6002 dated on Apr 2023
- Dr Ruchi Pandey published a paper topic **"Thermal Performance Analysis Of Parabolic Trough Solar Collectors Using Al2o3 And Cuo Nanofluids And Water And Ethylene Glycol As Base Fluid"** On Journal Of Emerging Technologies And Innovative Research (JETIR) Www.Jetir.Org , Volume 10, Issue, ISSN-2349-5162 Dated On Feb 2023.
- Dr Ruchi Pandey published a paper topic **"Biomass Gasification Of Agro – Waste: - A Potential Assessment For Seoni, Region"** On Accent Journal Of Economics Ecology & Engineering , Vol. 08, Issue 01, January 2023 , ISSN No. 2456-1037 Dated On Jan 2023.
- Dr Rajeev Kumar Chauhan published a paper topic **"Fuel-Efficiency Improvement By Component-Size Optimization In Hybrid Electric Vehicles"** on World Electric Vehicle Journal , 2023, 14(1), 24, ISSN:2032-6653 dated on 15 Jan 2023.

## ACHIEVEMENTS

- Mr. Anand Goswami published a paper topic **"Biomass Gasification Of Agro – Waste: - A Potential Assessment For Seoni, Region"** On Accent Journal Of Economics Ecology & Engineering , Vol. 08, Issue 01, January 2023 , ISSN No. 2456-1037 Dated On Jan 2023
- Mrs. Rashi Goswami published a paper topic "Study & Analysis Of Power Quality Improvement Of DC Drive Using Internet Of Things" on International Journal Of Novel Research In Engineering And Science, Vol 9 Issue 3 dated on March 2023.
- Dr Rajeev Kumar Chauhan published a paper topic **"Replacement Of LVDS To HVDS For Reduction In Distribution Losses, Improvement In Voltage Profiles And Economic Analysis For National Saving"** on Recent Advances In Electrical & Electronic Engineering, Volume 15, Issue 8, Pp: 17-29, ISSN (Print): 2352-0965 ISSN (Online): 2352-0973 dated on Oct 2022.
- Dr. Pawan Kumar Pandey published a paper topic **" A Review Article of Statcom Design And Inhancement Controlling Of Power Quality"** on International Journal Of Scientific Research & Engineering Trends , 8-5 , 2395 - 566 X dated on Oct 2022.
- Mr. Anand Goswami published a paper topic **"Biomass Gasification Of AGRO-Waste:- A Potential Assessment For Seoni Region-A Review"** on Journal Of Emerging Technologies And Innovative Research (JETIR) , Volume 9 Issue 06, ISSN 2348-4918 dated on Dec 2022.
- Dr. Ruchi Pandey published a paper topic **"An Exploratory Investigation Towards Evaluating Criteria's To Solar Panels: Study Under Mcdm Directory**" on International Journal of Innovative Research In Electrical, Electronics, Instrumentation And Control Engineering , Vol. 10, Issue 8, August 2022 , ISSN (O) 2321-2004, ISSN (P) 2321-5526 dated on August 2022
- Dr. Ruchi Pandey published a paper topic **"Evaluation Of Solar Panels For Improved Competency: A Comparative Study And Appraisement With Topsis"** On International Advanced Research Journal In Science, Engineering And Technology, Vol. 9, Issue 7, July 2022 , ISSN (O) 2393-8021, ISSN (P) 2394-1588 dated on July 2022.
- Dr Rajeev Kumar Chauhan published a paper topic **"Multistage Expansion Planning Of Active Distribution System Network"** on Recent Advances In Electrical & Electronic Engineering Volume 15, Issue 3, Pp: 216-233, ISSN (Print): 2352-0965 ISSN (Online): 2352-0973 dated on Jul 2022.
- Dr Rajeev Kumar Chauhan published a paper topic **"Multi-Period Expansion Planning For Distribution Network Incorporating Multiple Cost And Reliability"** on IEEE-PSES, 3rd International Conference On Engineering And Advancement In Technology (ICEAT 2022), ISBN 978-93-81288-22-1, dated on Jul 2022

## BOOK PUBLICATION :

- Mr. Anand Goswami Published a Book titled Micro Electronic Materials by RK Publications (Registered under MSME) Government of India ISBN No: - 978-93-95331-72-2, Year: 2022

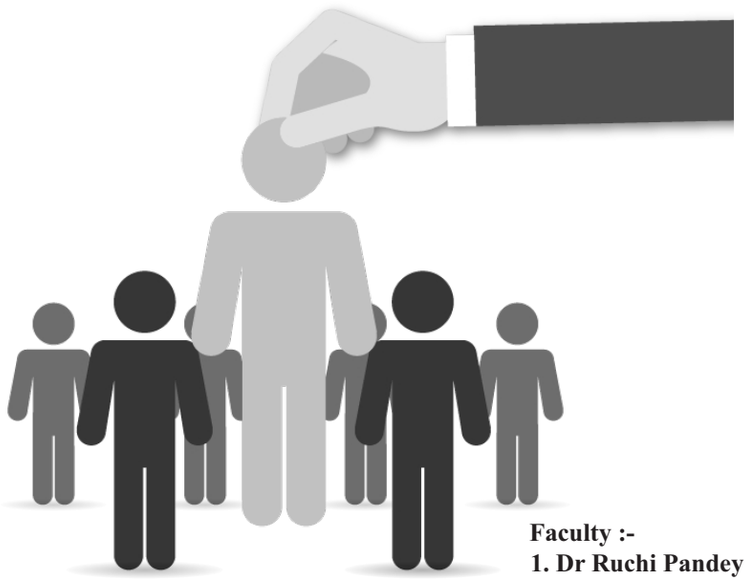
# Placements

GYAN GANGA
GROUP OF INSTITUTIONS
Committed for Excellence

| Batch 2023 | | | | |
|---|---|---|---|---|
| **S.no.** | **Name of the student placed** | **Enrollment no.** | **Name of the Employer** | **Appointment letter reference no. with date** |
| 1 | MADHUKAR TIWARI | 0206EX191022 | Unthinkable Solutions | Offer, Sep. 10, 2022 |
| 2 | DEEPALI MISHRA | 0206EX191014 | TCS | Mail, Dec. 29, 2022 |
| 3 | KAPIL GIRI | 0206EX191019 | TCS | Mail, Dec. 29, 2022 |
| 4 | RAKSHA PATLE | 0206EX191032 | TCS | Mail, Dec. 29, 2022 |
| 5 | SHUBHASH DAHERIYA | 0206EX191046 | TCS | Mail, Dec. 29, 2022 |
| 6 | AKANKSHA TOMAR | 0206EX191004 | BSR | Mail, Jan. 13, 2023 |
| 7 | AMAN TUMRAM | 0206EX191008 | BSR | Mail, Jan. 13, 2023 |
| 8 | ASHUTOSH PATEL | 0206EX191012 | BSR | Mail, Jan. 13, 2023 |
| 9 | SHIVAM SHUKLA | 0206EX191043 | BSR | Mail, Jan. 13, 2023 |
| 10 | ADARSH VISHWAKARMA | 0206EX191001 | Ascendion Engg. | Mail, Mar. 15, 2023 |
| 11 | PARAS JHARIYA | 0206EX191029 | Ascendion Engg. | Mail, Mar. 15, 2023 |
| 12 | SAKSHI TAMRAKAR | 0206EX191038 | Ascendion Engg. | Mail, Mar. 15, 2023 |
| 13 | VISHWESH VYAS | 0206EX191055 | Ascendion Engg. | Mail, Mar. 15, 2023 |
| 14 | AKSHAT JAIN | 0206EX191006 | Bureau Veritas | Mail, Apr. 08, 2023 |
| 15 | KHUSHBOO AGARWAL | 0206EX191020 | Bureau Veritas | Mail, Apr. 08, 2023 |
| 16 | MEGHA MASHRAM | 0206EX203D03 | Bureau Veritas | Mail, Apr. 08, 2023 |
| 17 | VANSHITA NAGWANSHI | 0206EX191052 | Bureau Veritas | Mail, Apr. 08, 2023 |
| 18 | KARAN SINGH THAKUR | 0206EX203D01 | Shriram Finance | Mail, Apr. 13, 2023 |
| 19 | PIYUSH CHOURASIA | 0206EX191030 | Shriram Finance | Mail, Apr. 13, 2023 |
| 20 | SAJAL BARMAN | 0206EX191036 | Shriram Finance | Mail, Apr. 13, 2023 |
| 21 | SANDEEP SAHU | 0206EX191039 | Shriram Finance | Mail, Apr. 13, 2023 |
| 22 | KRUTIN KUMAR MOHANTY | 0206EX191021 | AV_Services | Offer, June 10, 2023 |
| 23 | NISHALI GHOSHI | 0206EX203D04 | AV_Services | Offer, June 10, 2023 |
| 24 | SOURAV KATARYA | 0206EX191049 | AV_Services | Offer, June 10, 2023 |



| | | | | |
|---|---|---|---|---|
| 26 | SOURAV KATARYA | 0206EX191049 | | |
| 27 | SURBHI SHRIVASTAVA | 0206EX191050 | | |
| 28 | UTTAM LAL YADAV | 0206EX191051 | | |
| 29 | VANSHITA NAGWANSHI | 0206EX191052 | | |
| 30 | VIKRAM SINGH THAKUR | 0206EX191054 | | |
| 31 | VISHWESH VYAS | 0206EX191055 | | |
| 32 | PRATEEK PARMAR | 0173EX191011 | | |
| 33 | KARAN SINGH THAKUR | 0206EX203D02 | | |
| 34 | DEEPALI MISHRA | 0206EX191014 | | |
| 35 | MADHUKAR TIWARI | 0206EX191022 | | |
| 36 | ADARSH VISHWAKARMA | 0206EX191001 | | |
| 37 | RAKSHA PATLE | 0206EX191032 | | |
| 38 | AKSHAT JAIN | 0206EX191006 | | |
| 39 | | | | |



## EDITORIAL TEAM

**Faculty :-**

1. **Dr Ruchi Pandey**
2. **Prof. Shalini Vaishya**
3. **Prof. Ashok Soni**

**Students :-**

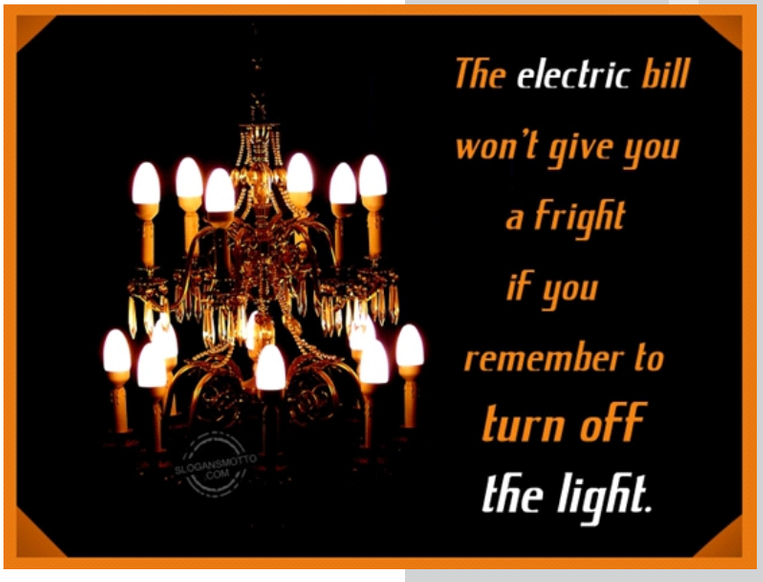
1. **Khushboo Agrawal**
2. **Shivahans Singh**
3. **Zoukia Akhtar**
4. **Tanish Chourasiya**

## INDUSTRIAL VISIT:

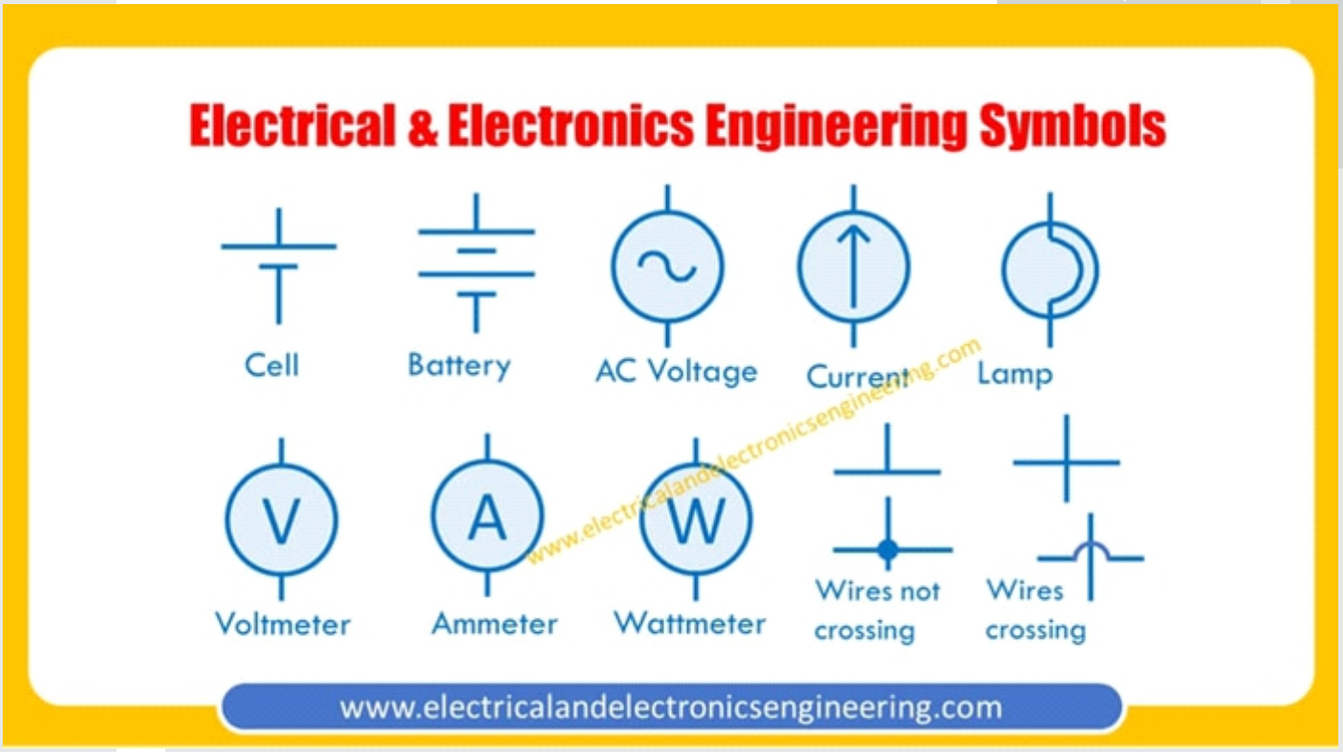

## PAHEL 2k22


## SLOGANS

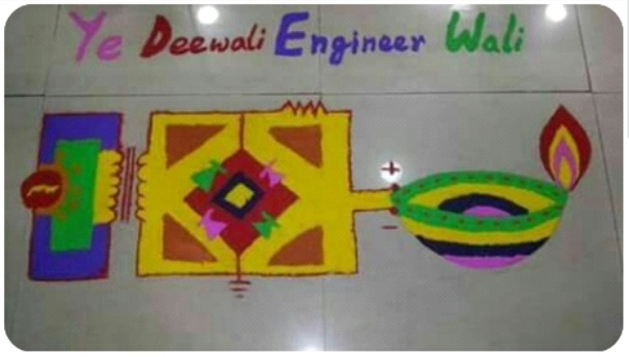




## Symbols




## Technical Rangoli




By : VII Semester Students


By : V Semester Students


By : V Semester Students

By : VI Ashok Students

# GYAN GANGA

## GROUP OF INSTITUTIONS

*Committed for Excellence*


**P.O. Tilwara Ghat, Bargi Hills, Jabalpur, Madhya Pradesh Pin No. - 482003**

Connect with us:- LinkedIn twitter **www.ggits.org**