



माधव प्रौद्योगिकी एवं विज्ञान संस्थान, ग्वालियर (म.प्र.), भारत  
MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR (M.P.), INDIA  
**Deemed to be University**  
(Declared Under Distinct Category By Ministry Of Education, Government Of India)  
NAAC ACCREDITED WITH A++ GRADE

# ELEC - TECH TIMES

ELECTRICAL ENGINEERING DEPARTMENT

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*Creativity leads to thinking, Thinking provides  
knowledge, Knowledge makes you GREAT.*

*By : Dr. A.P.J. Abdul Kalam*

E-mail : [eednewsletter@gmail.com](mailto:eednewsletter@gmail.com)



The Department of Electrical Engineering established in 1957, boasts a rich history as one of the institution's most earliest departments, initially enrolling 40 students. Currently, the department provides a diverse spectrum of educational opportunities, encompassing undergraduate, postgraduate, and doctoral programs in various Electrical Engineering disciplines. As of now, the B.Tech. program has a total capacity of 120 students, while the M.E. program in "Industrial Systems & Drives" accepts 25 students. Notably, in 2020, the department introduced a novel B.Tech. program focused on "Internet of Things," accommodating up to 60 students.

The department's primary areas of emphasis include Power Systems, Power Electronics, Control Systems, and Biomedical Instrumentation. To foster high-quality research, the department offers M.E. and Ph.D. programs, nurturing a culture of excellence in academic exploration. Equipped with cutting-edge laboratories, our department is dedicated to providing hands-on experiences that strengthen students' practical skills and actively support groundbreaking research initiatives.

Our department's mission is to prepare students for challenging roles in a wide array of industries and encourage engagement in research and development endeavors aimed at advancing society. To stay abreast of rapid technological advancements, our course syllabi are continually updated, and our laboratories are modernized.

Our course offerings cater to a broad spectrum of learning needs, spanning from foundational knowledge to advanced expertise. Furthermore, the department offers a wide range of elective courses to cover contemporary technological trends and developments.

## ***Vision***

***Our Vision: To Prepare Professionally Competent Electrical Engineers for Global Industrial requirements and Social needs***

## ***Mission***

***Our mission: Quality technical education, technology awareness, collaboration, and holistic student development through soft skills and ethics training.***

## WORKSHOP/WEBINAR ATTENDED

- Dr Vijay Bhuria attended Five Days National Virtual FDP On “Integrating NEP 2020 into Higher Education: Strategies for Faculty Development and Curriculum Innovation” from 02.09.2024 to 06.09.2024

## PUBLICATIONS

### (JOURNALS, CONFERENCES & BOOK CHAPTER)

- Sharma, K., Tiwari, R., Wadhvani, A. K., & Chaturvedi, S. (2024). An integrated GIS-MCDM framework for zoning, ranking and sensitivity analysis of municipal landfill sites. *Sustainable and Resilient Infrastructure*, 1–23. <https://doi.org/10.1080/23789689.2024.2404279> (SCI-Q1)
- Rinisha Bagaria, Sulochana Wadhvani & A K Wadhvani, “ A Support Vector Machine- based Classification for Distinct Medical Image Modalities, International Conference on 5th Congress on Intelligent Systems (CIS 2024) Organized in In-person and Online (Hybrid Mode) by CHRIST (Deemed to be University), Bengaluru and Liverpool Hope University, U.K September 04-05, 2024
- D. Kulshrestha, I. Trivedi, M. S. Mansuri, S. K. Rajput, G. Panse, and R. Sagwal, "Performance and Cash-flow Study of Rooftop Photovoltaic Plant for Dispensary Building Energy Demand," Accepted for Publishing in Proceedings of the 4th IEEE International Conference on Advancement in Electronics & Communication Engineering (AECE 2024), Raj Kumar Goel Institute of Technology, U.P., India, 2024

## CONTRIBUTING TO RESEARCH EXCELLENCE

- Dr Vijay Bhuria reviewed 9 Papers in International Conference on Electrical, Electronics and Computing Technologies (ICEECT-2024) Sharda University, Greater Noida, India

## CONTRIBUTING TO RESEARCH EXCELLENCE

Dr. Shishir Dixit has made significant contributions as a reviewer and an Editorial Board Member across various prestigious platforms. He has reviewed research papers for renowned conferences and journals, including:

- IEEE Access
- The 5th International Conference on Information Technology Advance Mechanical and Electrical Engineering (ICITAMEE)
- International Seminar on Research of Information Technology and Intelligent Systems (ISRITI)
- Graduate Conference on Biomedical, Pharmacology, Bioengineering, and Technology (ETCoS-Grace)
- BioPhTec-Grace 2024
- ICITCOM 2024: The 2nd International Conference on Information Technology and Computing organized by the Department of Information Technology, Yogyakarta, Indonesia
- In addition to his reviewing roles, Dr. Shishir Dixit serves as an Editorial Board Member for the book "Futuristic Trends in Electrical Engineering, Volume 3, Book 1, 2024", which is part of the IIP Series.

These roles reflect his expertise and commitment to advancing research in information technology, electrical engineering, and related interdisciplinary fields.

Dr. Nikhil Paliwal reviewed 7 research papers in the Engineering Applications of Artificial Intelligence Journal (Elsevier) and Optimal Control Applications and Methods (Wiley)

Prof. Vishal Chaudhary reviewed 5 Papers in International Conference on Electrical, Electronics and Computing Technologies (ICEECT-2024) Sharda University, Greater Noida, India

## GURUKUL QUEST - NATIONAL LEVEL QUIZ COMPETITION



The Gurukul Quest, a national-level quiz competition, took place online on 5th September 2024 from 1:00 p.m. to 2:00 p.m., organized by the Department of Electrical Engineering. Coordinated by Dr. Vijay Bhuria and Prof. Kuldeep Kumar Swarnkar, the event aimed to provide students with a platform to showcase their knowledge of the Indian Constitution and traditional knowledge. With 620 registrations from 20 colleges and universities, 562 students participated, making the quiz a resounding success. The competition featured 25 questions across two formats: picture recognition and multiple choice, covering significant topics related to the Constitution and cultural heritage.

Hosted on Google Forms, the quiz provided a seamless experience with features like automatic scoring and real-time feedback. The top three participants received hard copy certificates: Nandini Kushwah from Dayalbagh Educational Institute secured the first position, followed by Diya from Lovely Professional University in second place, and Abhishek Rajpoot from Madhav Institute of Technology and Science in third. Overall, the Gurukul Quest successfully engaged students nationwide and fostered a deeper appreciation for the Indian Constitution and traditional knowledge.

## BYTE THE BITS



Indian Society for Technical Education (ISTE Students' Chapter MITS) organized an enlightening and informative event, providing a comprehensive exploration of the intricate world of software development called “Byte the Bits” on 10th August 2024. The event aimed to provide participants with valuable insights into the world of software development, covering essential topics and emerging trends in the field. The webinar attracted a diverse audience, including students, professionals, and enthusiasts, eager to deepen their understanding of software development practices.

## BYTE THE BITS



## SECOND YEAR

**Rajvardhan Singh Tomar,** participated in the National Science Quiz, a technical event held from 15 August to 23 August. He achieved an impressive 4th position in the competition.



**Mohit Sharma** has participated in several events, including Gurukul Quest on which featured various activities related to programming, robotics, and mathematics, earning a certificate for his participation.



**Ajay Rana,** took part in the "Meteorological Challenge in Environmental Surveillance", a one-day national-level technical workshop organized by Legal Metrology on July 20, 2024. He received a certificate for his participation.

## SECOND YEAR

Abhishek Rajpoot participated in the National Level Gurukul Quest 2024, a quiz on the Indian Constitution and Traditional Knowledge, held on September 5, 2024, at MITS Gwalior.



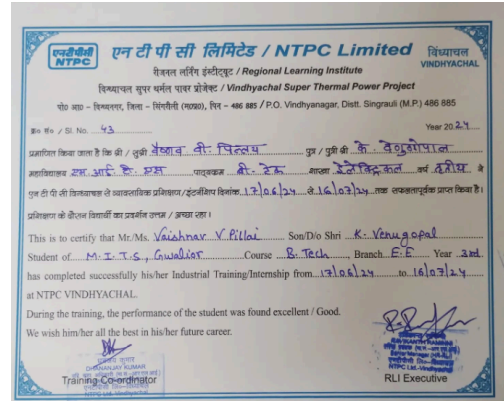
Aditi Jain participated in the E-Baatchit Seminar on July 6, 2024, and the National Gurukul Quest quiz on September 5, 2024, receiving e-certificates for both events at MITS Gwalior.





## THIRD YEAR

**Vaishnav V Pillai completed vocational training from June 17, 2024, to July 16, 2024, and received a certificate for the training.**

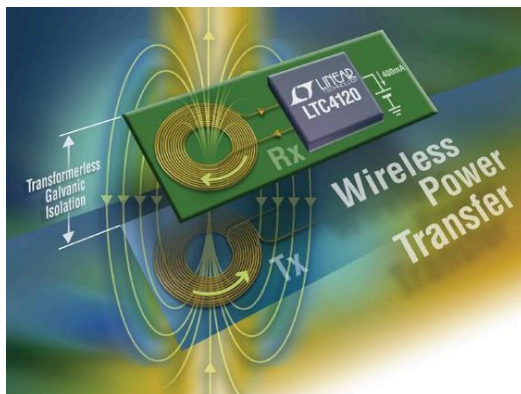


## ADVANCEMENTS IN BATTERY TECHNOLOGY

- **Solid-state batteries:** These batteries offer increased safety, faster charging times, and longer lifespans compared to traditional lithium-ion batteries. Recent breakthroughs in materials science and production processes have brought them closer to commercialization, potentially revolutionizing electric vehicles and grid storage.
- **Lithium-metal batteries:** While facing safety concerns, this technology promises even higher energy density than current lithium-ion batteries. Improved electrolyte designs and safety mechanisms are being explored to make them viable, potentially impacting everything from drones to portable electronics.



## WIRELESS POWER TRANSFER (WPT)



- **Mid-range WPT:** This technology allows for efficient wireless charging over distances of several meters, with applications beyond close-range smartphone charging. Imagine powering home appliances, furniture, or even medical implants without cables.
- **Dynamic WPT:** This evolving technique enables charging of moving objects like robots or electric vehicles, further expanding the possibilities of WPT.

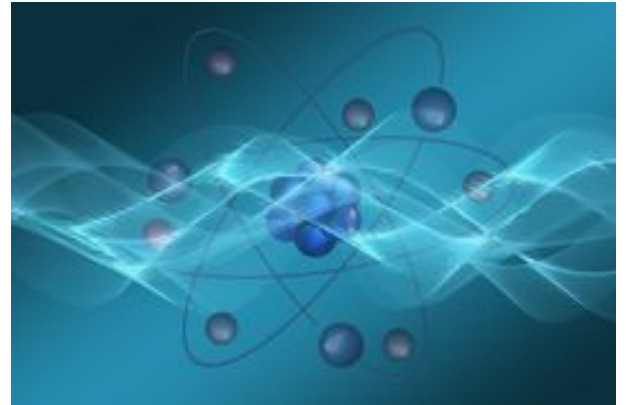
## AI AND ML FOR POWER SYSTEMS

- **Smart grid optimization:** AI algorithms are being used to optimize energy distribution in smart grids, improving efficiency, reducing waste, and enabling integration of renewable energy sources.
- **Predictive maintenance:** Machine learning models are being developed to predict equipment failures in power plants and grids, allowing for preventive maintenance and reducing downtime.



## **MATERIAL SCIENCE BREAKTHROUGH**

- **Gallium nitride (GaN) transistors:** These highly efficient transistors are replacing traditional silicon transistors in power electronics applications, enabling smaller, lighter, and more efficient devices.
- **Perovskite solar cells:** These emerging solar cell materials offer the potential for cheaper and more efficient solar energy conversion, potentially driving down the cost of renewable energy.



## **DRONES IN ELECTRICAL ENGINEERING**



- **Inspection and maintenance:** Drones equipped with sensors are increasingly used for inspecting power lines, wind turbines, and other electrical infrastructure, improving safety and efficiency.
- **Construction and repair:** Drones are being used to deliver tools and materials to remote locations or access hard-to-reach areas for repairs, minimizing risk and time spent on tasks.

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