



**Gujarat
Technological
University**

INTERNATIONAL INNOVATIVE UNIVERSITY

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R & D Newsletter

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- Collaborations/Interactions
- Research Oriented Talks

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Message From Hon'ble Vice Chancellor

Dear Faculty Members and Researchers,

We are pleased to share the latest issue of GTU's quarterly R&D newsletter, an initiative by the Research & Development Cell to strengthen our research ecosystem.

This issue features updates on workshops, collaborative events, and key R&D initiatives at both the university and affiliated colleges. It reflects our commitment to fostering a dynamic, interdisciplinary research environment that addresses real-world challenges.

We encourage you to join upcoming events and share this newsletter to showcase GTU's research efforts. Your support helps strengthen partnerships and broaden our impact across academia, industry, and society.

Congratulations to the R&D Cell team for their hard work and dedication in bringing out this quarterly newsletter.

Best wishes

(Dr. R. K. Gajjar)

He elaborated on key reforms under NEP-2020, such as flexible degree programs, establishment of a Higher Education Commission and creation of the National Research Foundation (NRF) to enhance research and accessibility. He also emphasized inclusive education for children with special needs and a shift toward experiential, learner-centric pedagogy integrating arts, projects with real-life applications.

Dr. Kumar outlined NEP 2020, as a roadmap toward a developed India, emphasizing holistic, flexible and inclusive education through reforms such as 5+3+3+4 structure and vocational training.

He introduced the National Innovation and Startup Policy-2019 and PARAKH, which promote entrepreneurship and competency-based assessments.

He highlighted key challenges in implementing NEP 2020, such as stakeholder resistance, inadequate infrastructure, and the imperative to ensure equitable access for marginalized communities. To overcome these issues, he also highlighted the importance of continuous professional development for educators, fostering strong institutional collaborations and exploring diversified funding avenues to create an inclusive and robust education ecosystem.



Session on Radiation, Nuclear Energy and Environment

The R&D Cell – Gujarat Technological University (GTU) organized an expert talk on “Radiation, Nuclear Energy, and Environment” on May 30, 2025 delivered by Dr. Dinesh Kumar Aswal, a senior member of the Trombay Council at Bhabha Atomic Research Centre (BARC) and Director, Institute for Plasma Research, Bhat, Ahmedabad.

Dr Aswal is known for pioneering the “Aswal Model” in metrology and had played a central role in re-defining SI units and developing the National Atomic Clock.

During the session, Dr. Aswal, emphasized the strong link between energy consumption and human development, advocating sustainable access as vital for national progress. He presented nuclear energy as a clean, more efficient alternative to coal, highlighting its pros and cons, along with India's closed nuclear fuel cycle focused on safety, recycling and sustainability.

He also emphasized the historic significance of Chicago Pile-1, the world's first nuclear reactor and its role in reshaping global energy systems. He discussed the Chernobyl disaster, addressing its human impact and societal responses, while critiquing the widespread fear of low-level radiation and its far-reaching consequences.

Dr. Aswal also discussed the Fukushima disaster, highlighting the gap between perceived and actual nuclear risks and presented contrasting models on radiation's impact on cancer cells.

During this session Dr. Aswal mentioned about India's advancements in fusion energy through the ADITYA-U and SST-1 Tokamaks. He emphasized the role of SST-1 in global fusion research and India's active participation in ITER, a multinational initiative toward sustainable and unlimited energy.



FDP on Emerging Frontiers in AI-Driven Edge & Quantum Computing: Bridging Future Technologies

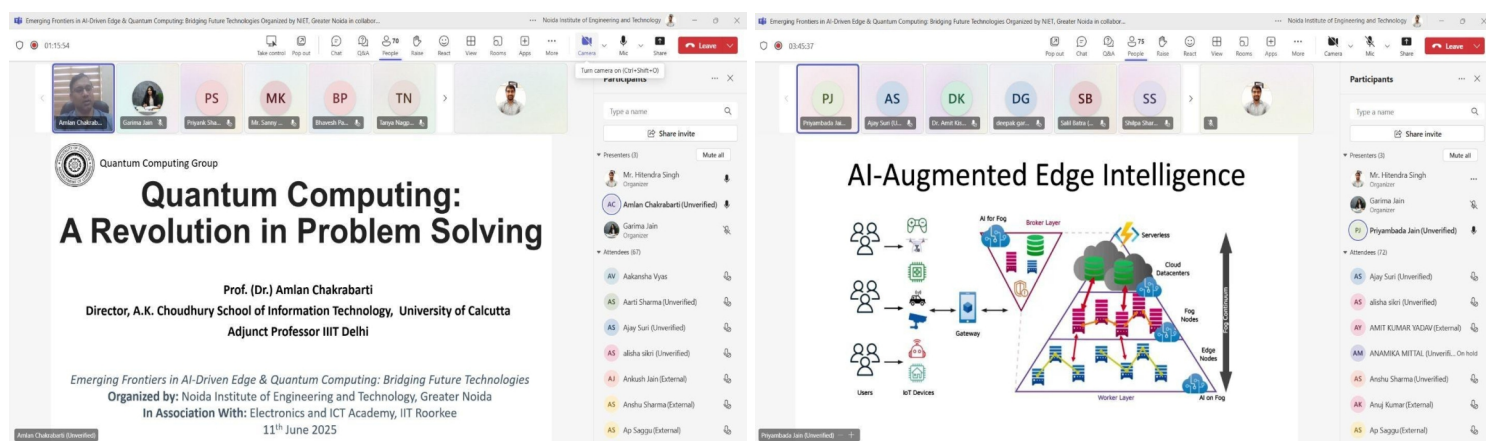
GTU - School of Engineering and Technology, in collaboration with the Electronics & ICT (E&ICT) Academy, an initiative of the Ministry of Electronics & Information Technology (MeitY), Government of India, conducted a one-week online Joint Faculty Development Programme on "Emerging Frontiers in AI-Driven Edge & Quantum Computing: Bridging Future Technologies" from 9-14 June, 2025 for faculty members, research scholars and undergraduate students. There were 63 participants in this FDP. This activity is conducted as a part of MoU signed between R & D Cell – GTU and E & ICT Academy – IIT Roorkee.

Distinguished experts from industry, academic and research institutions such as Noida Institute of Engineering & Technology (NIET), IIT Roorkee, Anuthantra Pvt. Ltd. (Bengaluru), SR University (Warangal), IBM Quantum, A.K. Choudhury School of Information Technology (University of Calcutta), Kaushalya- The Skill University and IIT Delhi delivered insightful presentations on cutting-edge technologies.

The sessions delved into a wide array of cutting-edge topics, such as the fundamentals of quantum computing, AI-augmented edge intelligence and quantum systems for future computing. They also featured hands-on workshops utilizing IBM's Qiskit framework, providing participants with practical exposure to transformative emerging technologies.

Experts delivered in-depth talks on advanced quantum algorithms such as Grover's Algorithm, quantum error mitigation techniques and the simulation of molecular systems. They also addressed topics related to convergence of quantum computing with high-performance computing (HPC), highlighting its implications for sectors such as transportation, 6G networks and AI-driven edge computing systems.

This FDP facilitated rich discussions on explainable AI, quantum-secure cryptographic methods and emerging trends in cyber-security, contributing significantly to the forward-thinking dialogue that shaped the academic proceedings.



FDP on Electric Vehicles Technology

GTU - ITR in collaboration with the Electronics & ICT (E&ICT) Academy, an initiative of the Ministry of Electronics & Information Technology (MeitY), Government of India, conducted a two-week Faculty Development Programme (FDP) on Electric Vehicle (EV) Technology from 9-16 June 2025. 43 participants attended the FDP. This activity is conducted as a part of MoU signed between R & D Cell – GTU and E & ICT Academy – IIT Roorkee.

This FDP was launched with an in-depth exploration of EV fundamentals delivered by Dr. Apurv Kumar Yadav and Dr. Mahendra Ghat, covering various types of electric vehicles, such as Battery Electric Vehicles (BEVs), Fuel Cell Electric Vehicles (FCEVs), Hybrid Electric Vehicles (HEVs), and Plug-in Hybrid Electric Vehicles (PHEVs). A detailed comparison between BEVs and Internal Combustion Engine Vehicles (ICEVs) was presented, followed by discussions on EV subsystems such as the propulsion system (electric motors, power electronics and mechanical components like gearbox & suspension), energy storage (battery packs, management systems and charging infrastructure), and communication networks (Vehicle-to-Vehicle and in-vehicle systems). The session also elaborated on EV configurations (2WD and 4WD), design methodologies, and the current EV landscape in India.

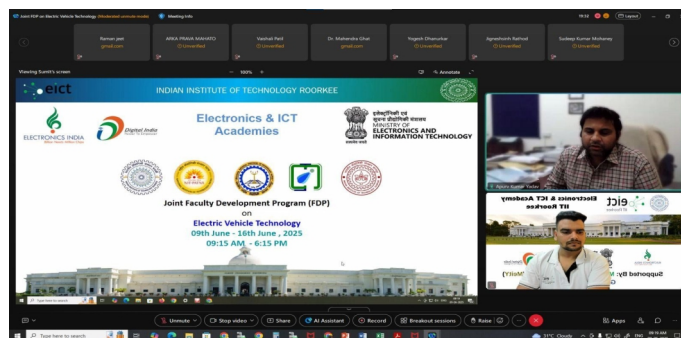
The programme also covered battery technologies, where Dr. Apurv Kumar Yadav provided insights into lithium-ion, solid-state, and next-generation batteries, along with Battery Thermal Management Systems (BTMS) and Battery Management Systems (BMS). Participants explored battery pack design, thermal and mechanical considerations, and real-world case studies on battery development.

Dr. Siba Kumar Patro delivered a lecture on electric propulsion systems, apprising the participants about the different motor types such as Brushless DC (BLDC) motors, Permanent Magnet Synchronous Motors (PMSM), Switched Reluctance Motors (SRM), and Induction Motors (IM). Advanced motor control strategies, including Field-Oriented Control (FOC) and Direct Torque Control (DTC), were explained to demonstrate efficient vehicle operation.

This FDP also addressed EV charging infrastructure, with discussions on fast charging, wireless charging, and international standards like CCS, CHAdeMO (CHARge de MOve), GB/T, and Bharat DC-001. Experts highlighted the role of smart grid integration and Vehicle-to-Grid (V2G) technologies in enhancing energy management and grid stability.

Further sessions focused on vehicle dynamics and control systems. Mr. Arvind Kumar Mishra discussed kinematics, dynamics and motion control. Mr. Avaneet Kumar presented on automated driving using Model Predictive Control (MPC), supported by MATLAB/Simulink simulations. Mr. Ashish Kothiyari introduced concepts of autonomous vehicle planning and control.

This FDP incorporated hands-on training, during which participants engaged in EV modeling, simulation and case study analysis using MATLAB/Simulink, addressing real-world design challenges. The programme concluded on a positive note, emphasizing the importance of ongoing skill development in EV technology through sustained collaboration between academia and industry.



GTU Visit of Director- INFLIBNET for Research Collaboration

Prof. Devika P. Madalli, Director- INFLIBNET Centre, Gandhinagar visited Gujarat Technological University (GTU), Ahmedabad on 20th May 2025 along with other scientists to have a meeting with Hon'ble Vice-Chancellor, Registrar and Director-R&D Cell to explore the possibilities of recognizing INFLIBNET as one of the research centres of GTU in view of the MoU that was signed for academic and research collaboration on 21st March 2025.

INFLIBNET has now been recognized Research Centre of GTU as per GTU-guidelines.



MoU with IPR (Institute for Plasma Research), Gandhinagar

On May 9, 2025, Gujarat Technological University (GTU) has signed a Memorandum of Understanding (MoU) with the Institute for Plasma Research (IPR)-Gandhinagar with the objective of strengthening academic and research collaboration for advanced research and teaching in plasma science and technology.





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