**One Week Online**

# Faculty Development Program

On

## Applications of Artificial Intelligence in 5G/6G Communication Systems

Under the banner of

**Electronics and ICT academy**

**at**

**National Institute of Technology Patna**

**08th September to 12th September 2025**

### Coordinators
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### Jointly Organized by
Electronics and ICT Academy, National Institute of Technology Patna and Maulana Abul Kalam Azad University of Technology, West Bengal

https://nitp-ict.ct.ws

### Patron
**Prof. P. K. Jain**

Director, NIT Patna

### Supported by
Ministry of Electronics and Information Technology (MeitY), Govt. of India.

## ABOUT NIT PATNA

The National Institute of Technology (NIT) Patna is one of India's most historic technical institutions, tracing its roots back to 1886, when it began as a pleaders' survey training school. Over time, it evolved into the Bihar College of Engineering Patna in 1924, making it the 6th oldest engineering institute in the country. On 28th January 2004, the college was rechristened as NIT Patna, becoming the 18th National Institute of Technology under the Ministry of Education, Government of India. NIT Patna has been a pioneer in technical education for well over a century, offering undergraduate (UG), postgraduate (PG), and PhD programs in engineering, technology, science, and humanities. Located on the south bank of the holy river Ganges, near the iconic Gandhi Ghat in Patna, the institute stands as a symbol of both academic excellence and cultural significance. With a mission to set high standards in education and research, NIT Patna is actively involved in research and development (R&D), pushing the boundaries of innovation across various fields. It holds a distinguished reputation for its long record of academic excellence and is dedicated to preparing students for the challenges of the global economy.

## ABOUT THE DEPARTMENT

The Department of Electronics and Communication Engineering at the NIT Patna began its journey in 1978 with just 10 undergraduate students. The department is dedicated to providing quality education and research at undergraduate (UG), postgraduate and Ph.D. levels. Currently, All courses are regularly updated by academic and industry experts to meet the needs of today's industry. The undergraduate program is accredited by the National Board of Accreditation (NBA) for six years. The department received a grant of 3.52 Crore from DST under the FIST scheme. VLSI Lab has also been upgraded with the support of the SMDP-C2SD project.

The department has a group of young, competent, and dedicated faculty members engaged in quality research in various areas such as VLSI, RF / Microwave Engg., Signal, Speech and Image processing, Wireless Communications and Networks

## ELECTRONICS AND ICT ACADEMY

The Ministry of Electronics and Information Technology, Government of India has instituted seven Electronics and Information & Communications Technology (ICT) Academies of which, the academy of NIT Patna is one. The Academy at NIT Patna aims to design and organize basic as well as specialized training programs in niche areas of electronics and ICT for the development of the required knowledge base, skills, and tools to equip the teaching community with better knowledge and understanding.

## ABOUT THE THEME

The proposed **Faculty Development Programme (FDP)** on **" Applications of Artificial Intelligence in 5G/6G Communication Systems "** is an advanced training initiative to empower faculty members with state-of-the-art knowledge and tools in the emerging domains of communication systems. With the onset of the 6th generation (6G) of wireless communication, technologies like cutting-edge knowledge on integrating AI techniques—such as machine learning, deep learning, and neural networks are set to revolutionize industries such as telecommunication, smart cities and signal processing. This FDP platform enhances faculty expertise, encourages interdisciplinary research, and prepares participants to address future challenges in intelligent wireless communication systems. Industry and academic experts will lead sessions to ensure a comprehensive learning experience, enabling participants to better prepare students for the future.

## OBJECTIVES OF THE PROGRAM

- Understand AI's Role in 5G/6G Networks: Delve into how artificial intelligence and machine learning are enhancing 5G communication systems and shaping the future landscape of 6G technologies.
- Learn AI-Driven Optimization Techniques: Investigate AI-based strategies for network slicing, beamforming, resource allocation, and massive MIMO to boost efficiency and performance.
- Explore Edge AI and Distributed Computing: Analyze the integration of AI with edge computing and fog networks to facilitate low-latency, high-speed communication.
- Enhance Security with AI: Examine AI-powered solutions for the detection and mitigation of cyber threats in 5G and 6G networks.
- Hands-on Implementation: Acquire practical experience through simulations, case studies, and tools such as Python, TensorFlow, and network simulators including MATLAB, Python, and NS-3.
- Foster Research & Collaboration: Promote interdisciplinary research and partnerships between industry and academia to advance AI applications in next-generation communication systems.

## TOPICS TO BE COVERED

- Overview of 5&6G networks: Vision, requirements, and expected capabilities
- Introduction to AI in 5G and 6G Communication system
- AI/ML in 5G optimization
- AI in Next Generation (6G) Communication Networks
- Edge AI and cloud integration
- Security and Trust in AI-Enabled Networks
- Simulation Tools for AI in 5G (Python, TensorFlow, NS-3, O-RAN)
- AI-Based Traffic Prediction and Load Balancing
- Real-World Deployments: AI in Telecom (Use Cases from Industry Leaders)
- Ethical and Regulatory Considerations in AI-Driven Networks

## RESOURCE PERSONS

**Resource persons from leading industries, IITs, NITs and other eminent institutes**

1. Prof. Rohit Budhiraja, IIT Kanpur
2. Prof. Rajesh M Hegde, IIT Kanpur
3. Dr. Sudhan Majhi, IISc Bangalore
4. Prof. V V Mani, NIT Warangal
5. Dr. Sudhir Kumar, IIT Patna
6. Dr. Prabhu Chandhar, Chandhar Research Labs
7. Prof. Vimal Bhatia, IIT Indore

And many others…………………………………

## FDP INCLUDES

05-days training will be conducted by experts from academia and industries with experience ranging from several years to several decades in delivering sessions in India and abroad. The training hour is 08 hours each day. The mode of training is Instructor-led live online.

- **40 Hours of Instructor-led live online Hands-on learning & Interactive Query Sessions.**
- Soft copy of study material, Training PPTs, recorded session & project code
- E-certificates will be given to participants who have **attended more than 70%** of the workshop sessions and complete the **assessment** at the end of the FDP.
- **MODE OF CONDUCTION: Online**
- **Timings: Mon-Fri (09.00 AM- 06.00 PM)**

## WHO CAN PARTICIPATE

Faculty members, Research scholars of recognized Universities from India and Abroad, Research scholars, Students, and Industry personals. However, priority will be given to the faculty members.

**Selection will be done on first-cum-first-serve basis.**

## REGISTRATION FEE

**For Indian Nationals:** Rs. 500/- (Faculty/ Research Scholar/Student), Rs. 500/- (Industry)
**For Foreigners:** 60 US Dollars (Faculty/Research scholar/student), 60 US Dollars (Industry)
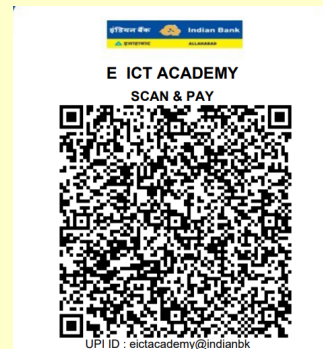
## REGISTRATION PROCESS

1. Registration fee should be paid through online mode, the account details for this purpose is
**Account Name: E AND ICT ACADEMY**
**Account No.: 50380476798 IFSC**
**Code: IDIB000B810**
**Bank Name: Indian Bank**

2. Registration form link:
**https://forms.gle/Swd328JvXmBZTD7R9**

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E ICT ACADEMY
SCAN & PAY

UPI ID : eictacademy@indianbk

**Scan the above QR code for payment using UPI apps.**

3. The brochure of the program may be downloaded from the website https://nitp-ict.ct.ws
4. **Registration deadline: 06 /09/2025, 11:59 PM (IST)**
5. A PDF file of the online filled registration form with proof of registration fee paid should be sent by email to **seemanti@nitp.ac.in / ritesh@nitp.ac.in**

## ADDRESS FOR CORRESPONDENCE

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