

One Week Faculty Development Program

On

Integrated Sensing and Communication: Concepts, Design, and Applications

September 24th -29th 2026 (Online Mode)

Under the banner of Electronics and ICT Academy, National
Institute of Technology Patna (HUB)

Faculty of Technology (FoT), University of Delhi



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Supported by

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Govt. of India.

ABOUT NIT PATNA

The National Institute of Technology (NIT) Patna is one of India's most historic technical institutions. 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. 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.

ABOUT FOT, DU

The Faculty of Technology (FoT), University of Delhi, is dedicated to excellence in engineering education, research, innovation, and technological advancement. It offers engineering programmes across diverse disciplines, fostering interdisciplinary learning and industry collaboration. With a strong focus on research-driven education, innovation, and societal impact, FoT provides an excellent academic environment for students, faculty, and researchers while contributing to the University of Delhi's vision of advancing knowledge and technology.

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

This Faculty Development Program (FDP), "Integrated Sensing and Communication: Concepts, Design, and Applications," aims to provide comprehensive knowledge of ISAC as a key enabling technology for future wireless networks. With the evolution from 1G to 6G, the integration of sensing and communication is emerging as a promising approach for achieving efficient spectrum utilization, enhanced situational awareness, intelligent decision-making, and low-latency connectivity. The program will cover the fundamentals of radar and wireless communication, ISAC architectures, DFRC systems, waveform design, MIMO, beamforming, signal processing, channel estimation, optimization, and AI/ML-based techniques. Emerging technologies such as RIS, mmWave, THz, and SDR-based prototyping will also be addressed. Participants will explore practical design challenges and applications of ISAC in autonomous vehicles, UAVs, IoT, smart healthcare, smart cities, and industrial systems. Through expert lectures, case studies, and hands-on demonstrations using MATLAB, Python, and SDR platforms, the FDP will bridge theoretical concepts with practical implementation, research opportunities, and emerging trends toward intelligent 6G-enabled communication and sensing systems.



FDP INCLUDES

In this FDP 05 days training will be conducted by experts from academia and industries with experience ranging several years to several decades in delivering within the country and abroad. The training hour 08 hours each day. The mode of training is instructor led live online.

- **40 Hours of Instructor-led live online Hands-on learning & Interactive Q&A 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: Thu-Tue (09.00 AM- 06.00 PM)

TOPICS TO BE COVERED

- Evolution of Wireless Communication Systems: From 1G to 6G and the Emergence of ISAC
- Fundamentals and Concepts of Integrated Sensing and Communication (ISAC)
- Fundamentals of Radar and Wireless Communication Systems
- ISAC Architectures, System Models, and Dual-Functional Radar-Communication (DFRC) Systems
- ISAC Waveform Design: OFDM, OTFS, and Emerging Waveforms
- Spectrum Sharing, Resource Allocation, and Joint Sensing-Communication Optimization
- Antenna and MIMO/Massive MIMO Techniques for ISAC Systems
- Beamforming, Precoding, and Space-Time Signal Processing Techniques
- Radar Signal Processing, Target Detection, and Parameter Estimation
- Channel Estimation, Adaptive Filtering, and Interference Mitigation
- AI/ML Approaches for Intelligent ISAC Systems
- Intelligent Reflecting Surfaces (IRS/RIS), mmWave, and THz Technologies for ISAC

- Hardware and RF Front-End Design Challenges and SDR-Based ISAC Prototyping
- ISAC Applications in Autonomous Vehicles, UAVs, IoT, Smart Healthcare, and Smart Cities
- ISAC Standardization, Security and Privacy Issues, Emerging Research Trends, and Future Directions with Hands-on Demonstrations

RESOURCE PERSONS (TENTATIVE)

1. Prof. Sudhan Manjhi, IISc Bangalore
2. Dr. Ekant Sharma, IIT Roorkee
3. Dr. Soumya Prakash Dash, IIT Bhubaneswar
4. Dr. Sanjeev Sharma, IIT (BHU) Varanasi
5. Dr. Prabhat Sharma, IRDE Dehradun, DRDO
6. Dr. Pratik Mevada SAC Ahmedabad ISRO
7. Rakesh Bhalla, TBRL Chandigarh, DRDO
8. Dr. Girish Chandra Tripathi, Tejas Networks
9. Other distinguished speakers from Academia and Industry

WHO CAN PARTICIPATE

Faculty members, Research scholars of recognized Universities from India and Abroad, Research scholars, Students, and Industry personnels. 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: NIT Patna
Account No.: 50380476798
IFSC Code: IDIB000B810
Bank Name: Indian Bank



2.Registration form link:

<https://forms.gle/TrWDt4Q2GTfa2fGP8>

3. The brochure of the program may be downloaded from the website <https://www.nitp.ac.in>

4. Registration deadline: **22nd September 2026**

5. A PDF file of the online filled registration form with proof of registration fee paid should be sent by email drsamantaray@fot.du.ac.in

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