A Report on
Faculty Development Programme (FDP) titled
"Smart and Sustainable Wireless Communications: Recent Trends and Emerging Applications"
Organized by Department of Electronics & Communication Engineering
in association with the Electronics & ICT Academy, NIT Warangal
Sponsored by: Ministry of Electronics and Information Technology (MeitY), Government of India
from 26.10.2026 to 05.11.2026

Report Submitted by: Dr. M. Ranjeeth & Dr. G. Subbarao, Department of Electronics & Communication Engineering.
Mode of Conduct: Online
Duration: 26th October to 5th November 2026 (10 Days / 20 Technical Sessions)
Report Received on 14.11.2026.

Programme Overview

Established at NIT Warangal with financial assistance from the Ministry of Electronics and Information Technology (MeitY), Government of India, the **Electronics & ICT Academy – Phase II** conducts standardized Faculty Development Programmes in emerging domains of electronics and information communication technologies, alongside industry consultancy, curriculum development, and entrepreneurial support.

This 10-day Online FDP was jointly organized with the Department of ECE, Madanapalle Institute of Technology & Science (MITS), Deemed to be University, to equip faculty members, research scholars, and industry professionals with comprehensive theoretical and practical insights into next-generation wireless ecosystems. The curriculum spanned the evolution from 5G to Beyond-5G and 6G networks, covering massive MIMO, intelligent reflecting surfaces (IRS), millimeter-wave and sub-THz communications, photonic technologies, AI/ML-driven wireless optimization, advanced antenna architectures, optical wireless links, and sustainable, energy-efficient communication paradigms. Selection was capped at a maximum of 52 participants on a first-come, first-served basis, with satisfactory certificates awarded upon successful completion.

Detailed Session-Wise Summary

The programme comprised **20 intensive two-hour technical sessions** (Morning Session: 10:30 AM – 12:30 PM; Afternoon Session: 2:30 PM – 4:30 PM) delivered by eminent academicians and domain experts from premier institutions including IISc Bangalore, IITs, NITs, IIITs, and international universities.

- **Session 1** Reinforcement Learning for 6G Communications
  Speaker: Dr. Chaya Bhar, NIT Warangal
- **Session 2** Metamaterial-Assisted High-Power Microwaves
  Speaker: Dr. Manpuran Mahto, NIT Patna
- **Session 3** Quantum Information Technology Using Photonics
  Speaker: Prof. T. Srinivas, IISc Bangalore
- **Session 4** Recent Trends and Emerging Applications Using Photonic Crystal Fiber (PCF)
  Speaker: Prof. Sanjay Kumar Gowre
- **Session 5** Synthetic Aperture Radar for Earth and Planetary Observations
  Speaker: Dr. D. Kiran, Manipal University
- **Session 6** SIW-Based Cavity-Backed Antennas
  Speaker: Dr. Arvind Kumar, NIT Nagpur
- **Session 7** Spatial Modulation for 6G Communication
  Speaker: Prof. S. Anuradha, NIT Warangal
- **Session 8** Investigation and Prediction Analysis of ANN-Based Modelling for GaN IMPATT Sources for THz Applications
  Speaker: Prof. Rudra Sankar Dhar, NIT Mizoram

- **Session 9** Secure Optical Wireless Communication for Next-Generation Networks
  Speaker: Dr. P. K. Sahu, Professor, SECS, IIT Bhubaneswar

- **Session 10** Theory of Merging Graphene Plasmons to Cavity Resonance for Tunable THz Devices
  Speaker: Dr. Gaurav Varshney, NIT Patna

- **Session 11** Applications of 5G & 6G Communication in Healthcare
  Speaker: Dr. B. Roshan, NIT Jalandhar

- **Session 12** Evolution of Wireless Multi-Antenna Systems and the Way Forward
  Speaker: Dr. Vimal Bhatia, IIT Indore

- **Session 13** AI in Wireless Communication
  Speaker: Dr. Kamesh, USA

- **Session 14** Radio Spectrum Utilization in 5G Applications
  Speaker: Dr. M. Ranjeeth, MITS – Deemed to be University

- **Session 15** Metasurface Absorbers from Microwave to THz
  Speaker: Dr. G. Subbarao, MITS – Deemed to be University

- **Session 16** Optical Wireless Communications for 6G
  Speaker: Dr. Prabhu, NIT Surathkal

- **Session 17** RASORBERS: Design and Applications in Wireless Environments
  Speaker: Dr. Anumoy Ghosh, NIT Mizoram

- **Session 18** From GSM Time Slot to Intelligent Surfaces
  Speaker: Dr. Rohit Singh, NIT Jalandhar

- **Session 19** Coding in 5G and Beyond Wireless Communications
  Speaker: Prof. S. Anuradha, NIT Warangal

- **Session 20** Antenna Applications in 5G Communications
  Speaker: Dr. M. Ranjeeth, MITS – Deemed to be University

Participants' Feedback Summary

Structured feedback collected at the conclusion of the FDP reflected high overall satisfaction with the contemporary, research-oriented curriculum that balanced foundational principles with frontier advancements in 6G, AI/ML signal processing, photonics, and metasurface engineering. Participants commended the clarity and depth of the 20 resource persons from premier institutions, noted that the sessions offered actionable insights for updating academic curricula and formulating funded research proposals, appreciated the seamless virtual coordination and timely sharing of study materials, and expressed keen interest in future hands-on workshops focusing on full-wave electromagnetic simulations (HFSS/CST) and AI/ML wireless prototyping.

Programme Outcomes & Conclusion

The 10-day Online FDP successfully bridged foundational theoretical concepts with cutting-edge research trends across 20 structured sessions. Participants gained actionable knowledge in 6G physical-layer enablers, AI/ML-driven wireless optimization, metamaterial and metasurface electromagnetics, optical/quantum communications, and sustainable spectrum management. The collaborative initiative between E&ICT Academy, NIT Warangal and the Department of ECE, MITS – Deemed to be University fostered academic networking and equipped faculty and researchers to advance curriculum development and funded research in smart wireless technologies.

UN-SDG Mapping:

SDG 9: Industry, Innovation, and Infrastructure
SDG 11: Sustainable Cities and Communities
SDG 17: Partnerships for the Goals