FACULTY DEVELOPMENT PROGRAMME (FDP)

ON

Recent and Emerging Trends in Wireless Communication: 4G and 5G Technologies

(6th - 16th September 2021)

(Virtual Mode)

Organized by

E & ICT Academy, NIT Warangal

in Association With

G. Narayanamma Institute of Technology and Science (For Women), Autonomous, Hyderabad

(Sponsored by Ministry of Electronics and Information Technology (MeitY), GOI)

Preamble:

"Electronics & ICT Academy" was set up at NIT Warangal with financial assistance from MeitY, GoI. The jurisdiction of this academy is Telangana, Andhra Pradesh, Karnataka, Goa, Puducherry and Andaman & Nicobar Islands. This academy role is to offer faculty development programs in standardized courses and emerging areas of Electronics, Information Communication Technologies, training & consultancy services for Industry, Curriculum development for Industry, CEP for working professionals, Advice and support for technical incubation and entrepreneurial activities.

About the FDP:

The fifth generation (5G) wireless connectivity is expected to offer high speed, enriched capacity, lower latency, ultra-high reliability and the ability to connect massive number of connections, namely, Internet of Things (IoT), Machine to Machine (M2M) and Device to Device (D2D) devices. In addition to offering faster speeds and other consumer benefits, 5G is seen as crucial to advanced technologies like vehicle type applications, IoT and virtual reality and augmented reality that demand high speed and bandwidth. In addition, the industry has made plans for next generation of technology, sixth generation (6G) at frequencies from 100 GHz to 1 THz and offer speeds up to 100 Gbps with very low latency. According to the researchers, 5G/6G devices will be able to handle hundreds or even thousands of simultaneous connections that should offer more capacity with lower power requirements.

Major Course Contents:

- **Evolution of Cellular Communication Standards 1G – 5G**
- **Diversity and Combining Techniques and Performance Trade-off**
- **Channel Models for Wireless Communication**
- **5G/6G Wireless Communication Systems and Research Challenges**
- **5G: Challenges and Enabling Technologies**
- **Device-to-Device (D2D) communications**
- **Codes for 5G Wireless**
- **Transmission and Design Techniques for 5G**
- **Spectrum Sensing and Cognitive Radio**
- **Resource Allocation for Wireless Communications**
- **Software Defined Networks**
- **MIMO & 5G**
- **Realization of microwave and millimetre-wave Devices for 5G wireless Communications**
- **Machine Learning Application**

Faculty conducting this programme:

The programme will be conducted by the faculty member from NIT Warangal. Academicians from IITs are invited to deliver lectures in the programme. Experts from Industries will also be invited to deliver lectures in this workshop.

Eligibility:

The program is open to the Faculty of Engineering Colleges and other allied disciplines in India. Industry personnel working in the concerned discipline can also attend.

Registration Fee Particulars:

Faculty and Research Scholars	**Rs.750/-**
Industry Participants	**Rs.2250/-**

Participants need to pay the Registration Fee Online using the following details.

Online Transfer Details
Account Name: Electronics & ICT Academy NITW
Account No: 62423775910
IFSC: SBIN0020149

Add payment reference as: FDPRWC5G

How to apply:

Participants are required to fill the online registration form by clicking on the following link:

https://forms.gle/YTy3xeHHzput79Nu5

Selection Criteria:

Selection will be done based on first-come-first-serve basis to a maximum number of 60 (sixty). Additionally, 10 participants from industry are allowed to participate. The list of selected participants will be intimated through e-mail. In case a candidate is not selected, the DD will be sent back. Candidates will be issued satisfactory certificates on successful completion of the course. Reservations are followed for selecting candidates as per GOI norms.

Important dates:

Last date for submission of Application	01-09-2021
Selection List by E- mail	02-09-2021
Duration	06-09-202 to 16-09-2021

About NIT Warangal:

National Institute of Technology, Warangal is the first among 17 RECs setup as joint venture of the Government of India and the state government. Over the years the college has established itself as a premier Institute imparting technical education of a very high standard leading to the B.Tech degrees in various branches of engineering, M.Tech. and Ph.D programs in various specializations. All B. Tech and M. Tech programmes of NIT Warangal are NBA accredited.

About GNITS:

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PRINCIPAL
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Shaikpet, Hyderabad - 500 104.

RECENT AND EMERGING TRENDS IN WIRELESS COMMUNICATION: 4G and 5G TECHNOLOGIES

(6th September-16th September, 2021)

Programme schedule

Day	Date	11 a.m to 1 p.m	2 p.m to 4 p.m
		Topics	Topics
Monday	6/9/2021	OFDM-1/5G Architecture	A bird's eye view on statistical estimation theory for wireless communication systems
Tuesday	7/9/2021	Enabling Technologies for 5G	5G/6G wireless systems and a few research challenges
Wednesday	8/9/2021	5G	Diversity and combining Techniques- Performance Tradeoff
Thursday	9/9/2021	MAC layer	Machine Learning-1
Friday	10/9/2021	**Holiday**	**Holiday**
Saturday	11/9/2021	Throughput prediction in next generation cellular networks using ML	Throughput prediction in next generation cellular networks using ML
Sunday	12/9/2021	Machine Learning-2	Machine Learning-3
Monday	13/9/2021	mm wave front-end and component design	OFDM-2
Tuesday	14/9/2021	Modeling Communication Systems with MATLAB & Simulink	Software Defined Networks
Wednesday	15/9/2021	Design and Simulate Complex Wireless Systems with MATLAB & Simulink	Massive MIMO and Algorithms
Thursday	16/9/2021	Massive MIMO for 5G	Massive MIMO and Algorithms

List of resource persons scheduled

1.	Prof. Raghunadh MV	NITW	7.	Prof. Basabdatta Palith	IIEST, Shibpur
2.	Prof. Pradhan HS	NITW	8.	Prof. Arun Kumar G	NITW
3.	Prof. Sameer	NIT, Calicut	9.	Prof. Praful P. Pai and team	Mathworks
4.	Prof. Preetham Kumar	IIT, Patna	10.	Prof. Manoj BS	IIST, Thiruvananthapuram
5.	Rajarshi Mahapatra	IIIT, Naya Raipur	11.	Prof. Vimal Bhatia	IIT Indore
6.	Prof. Ravi K Kodali	NITW			

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Department: Electronics and Telematics Engineering

2021-22

REPORT

Recent and Emerging Trends in Wireless Communications:4Gand 5G Technologies

Resource person: Prof. Raghunadh M.V.

Date of program: 06-09-2021 to 16-09-2021

I M.Vijaya Lakshmi,Asst.prof,ETE, attended the FDP "Recent and Emerging Trends in Wireless Communications:4Gand 5G Technologies" held at GNITS ,Hyderabad.I have learned the following concepts. Evolution of cellular Communication Slandards 1G- 5G, Diversity and Combining Techniques and Performance trade-off, Models for Wireless communication, 5G/6G systems and research challenges, Device-to-Device code for 5G wireless communications, Trasmission and Design Techniques for 5G,spectrum seasing and Resource Allocation for Wireless communications,Software Defined network,MIMO&5G, Realization of microwave and millimeter wave Devices for 5G wireless communications, Machine Leraing Applications.Thesee are helpful for me to guide project works.

Signature of the Faculty member

M.Vijaya Lakshmi, Asst Professor,ETE

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