



# Electronics & ICT Academy

(Under Ministry of Electronics and Information Technology, Government of India)  
Indian Institute of Technology Guwahati, Guwahati, Assam, Pin 781039

Phone: +91-361-2583182, 2583009 Email: [eictacad@iitg.ac.in](mailto:eictacad@iitg.ac.in)

## Faculty Development Programme

On

## “Emerging Trends in Wireless Communication”

Venue: Department of Electronics and Communication, NERIST, Nirjuli.

Date: 26-30 November, 2018

Date	Time	Topic
26-11-2018 (Day 1)	08:30 am-9:00 am	Registration & Reporting
	9:00 am-9:30 am	Inauguration
	9:30 am-11:00 am	<b>Module 1:</b> Evolution of Wireless Communication technology generations, Radio propagation and modeling of wireless channels
	11:00 am-11:15 am	Tea Break
	11:15 am-1:15 pm	<b>Module 1:</b> Fundamentals of cellular systems, Multiple access Techniques, Digital communication over fading channel; Equalization and channel coding
	1:15 pm-02:15 pm	Lunch Break
	02:15 pm-03:45 pm	<b>Module 1:</b> Spread spectrum-Spread Spectrum Principles, Direct Sequence Spread Spectrum (DSSS) system model, Processing gain, Spreading codes, Multiple access interference, Power control, Synchronization, Rake receiver
	03:45 pm-04:00 pm	Tea Break
	04:00 pm-05:15 pm	<b>Module 1:</b> Multi-carrier system- The Multicarrier Concept, Orthogonal Frequency Division Multiplexing (OFDM) basics,
	05:15 pm – 05:30 pm	MCQ
27-11-2018 (Day 2)	09:00 am-11:00 am	<b>Module 2:</b> Timing and Frequency Synchronization, The Peak-to-Average Ratio, Single-Carrier Frequency Domain Equalization (SC-FDE)
	11:00 am-11:15 am	Tea Break
	11:15 am-01:15 pm	<b>Module 2:</b> Multiple Input Multiple Output (MIMO) wireless systems-Narrowband MIMO Model, parallel decomposition of MIMO channel
	01:15 pm-02:15 pm	Lunch Break
	02:15 pm-03:45 pm	<b>Module 2:</b> Receive diversity and transmit diversity
	03:45 pm-04:00 pm	Tea Break
	04:00 pm-05:15 pm	<b>Module 2:</b> MIMO Channel Capacity for various conditions, Diversity–Multiplexing Trade-offs
	05:15 pm – 05:30 pm	MCQ



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28-11-2018 (Day 3)	09:30 am-11:00 am	<b>Module 3:</b> Introduction to LTE, Channel structure of LTE, Orthogonal Frequency Division Multiple Access (OFDMA), Introduction to LTE Advanced- carrier aggregation
	11:00 am-11:15 am	Tea Break
	11:15 am-12:15 pm	<b>Module 3:</b> OFDMA and SC-FDMA in LTE, MIMO-OFDM, An overview of MIMO in LTE
	12:15 am-01:00 pm	<b>Module 3:</b> Hands on demonstration of LTE Signal Creation & Signal Analysis
	01:00 pm-02:00 pm	Lunch Break
	02:00 pm-03:00 pm	<b>Module 3:</b> Introduction to Cellular IoT and Non-Cellular IoT Technologies
	03:00 pm-03:15 pm	Tea Break
	03:15 pm-05:15 pm	<b>Module 3:</b> 5G New Radio Technology Overview and Deployment Scenarios, 5G New Radio R&D Workflow, Massive MIMO, Beamforming and RF subsystems for 5G
	05:15 pm – 05:30 pm	MCQ
29-11-2018 (Day 4)	09:00 am-10:00 am	<b>Module 4:</b> 3GPP Release 15 Overview for 5G New Radio
	10:00 am-10:45 am	<b>Module 4:</b> Keysight Software Solutions for LTE & 5G Systems
	10:45 am-11:00 am	Tea Break
	11:00 am-11:45 pm	<b>Module 4:</b> 5G System Design & Validation with SystemVue
	11:45 am-01:00 pm	<b>Module 4:</b> Hands on Lab - Getting started with SystemVue & Phased Array RF System Design
	01:00 pm-02:00 pm	Lunch Break
	02:00 pm-03:30 pm	<b>Module 4:</b> End-2-End Phased Array System Analysis with EVM and BER
	03:30 pm-03:45 pm	Tea Break
	04:00 pm-05:15 pm	<b>Module 4:</b> 5G System Verification Benches
	05:15 pm – 05:30 pm	MCQ
30-11-2018 (Day 5)	09:00 am-11:00 am	<b>Expert Talk</b> by Prof. Ratnajit Bhattacharjee, IIT Guwahati on “Antennas for Wireless Handsets”
	11:00 am-11:15 am	Tea Break
	11:15 am-01:15 pm	<b>Expert Talk</b> by Prof. Ratnajit Bhattacharjee, IIT Guwahati on “Adaptive Arrays/Smart Antennas”
	01:15 pm-02:15 pm	Lunch Break
	02:15 pm-03:45 pm	<b>Expert Talk</b> by Prof. Md. Anwar Hussain, NERIST on “Role of MIMO Antennas in the Cooperative Cognitive Radio Networks”
	03:45 pm-04:00 pm	Tea Break
	04:00 pm onwards	Valedictory and Certificate Distribution