

Organized by Prof. Aditya K. Jagannatham, EE Department , IIT Kanpur in association with
E & C Dept., Ramaiah Institute of Technology, Bengaluru

July 25th-28th , 2018

**Capstone Project Course
on
mmWave MIMO and Filter
Bank Multi-Carrier
Technologies for
5G Networks**



Important Dates

Course Dates
July 25th - 28th , 2018

Last Date for Registration
July 13th , 2018

Venue

Seminar Hall - II,
Lecture Hall Complex -I (LHC-I),
Ramaiah Institute of Technology
Mathikere, Bengaluru-560054
Karnataka

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Millimeter (mm) Wave MIMO and Filter Bank Multi-Carrier (FBMC) are key technologies in realizing the massive data rates of 5G wireless networks. mmWave technology leverages the vast spectral opportunities in the mmWave band (30 – 300 GHz), to achieve up to 100X increase in data rates over current systems. On the other hand, FBMC enables broadband communication with superior properties in comparison to OFDM, due to its sharp subcarrier filters. These technologies enable novel applications such as WirelessHD, WiGig Technology, V2V/ V2I Communication, VR Headsets and various others. However, practical implementation of mmWave technology is highly challenging due to the significantly higher propagation loss incurred by mmWave signals at higher carrier frequencies coupled with the increased complexity of hardware required for signal processing in such high bandwidth systems, decreased multipath richness and increased signal blockage effects. FBMC is additionally challenging due to the intrinsic interference that is characteristic of such systems.

To overcome the above challenges, Massive Multiple-Input Multiple-Output (Massive MIMO) technology together with novel Hybrid RF-Baseband processing has emerged as the leading architecture for mmWave, while MIMO FBMC/ OQAM architecture is ideally suited for FBMC implementation. The aim of this course is to introduce 5G mmWave MIMO and MIMO-FBMC technologies to participants at all levels. The course will comprehensively cover the relevant technology aspects spread over various modules focusing on mmWave MIMO Technology, Hybrid Precoding-Combining, Analog Beamforming, mmWave MIMO Channel Modeling/ Estimation, FBMC System Design, MIMO- FBMC Technology, Equalization and other aspects. The capstone project on the final day will focus on hands on MATLAB simulation of mmWave MIMO and MIMO-FBMC systems to introduce participants to practical project implementation.

Target Audience

- Ph.D. scholars pursuing research in Wireless Technologies
- M.Tech/B.Tech students doing thesis/projects in Wireless
- ECE/EEE/CSE Faculty of Government and Private engineering colleges/universities
- Engineers from Wireless Industry and R&D Institutions