



विद्युत अभियांत्रिकी विभाग  
DEPARTMENT OF ELECTRICAL ENGINEERING  
भारतीय प्रौद्योगिकी संस्थान कानपुर  
INDIAN INSTITUTE OF TECHNOLOGY KANPUR  
कानपुर- 208 016 (भारत)  
KANPUR - 208 016 (INDIA)

Phone : (0512)-2597409  
2597164  
2597454  
Fax : (0512)-2590063  
Webpage : <http://www.iitk.ac.in/ee>

27<sup>th</sup> December, 2018

Dear HOD/ Professor

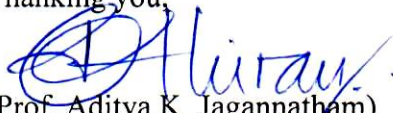
A short course titled “**Mini-Project Course in Hyderabad on MU-MIMO, Massive MIMO and OFDM Technologies for 5G Networks**” is being organized by IIT Kanpur from 27<sup>th</sup> to 30<sup>th</sup> March 2019, in association with ECE Department., University College of Engineering, Osmania University, Hyderabad. Multi-User MIMO, Massive MIMO and OFDM are key technologies for the realization of 5G wireless networks. This course is geared towards B.Tech/ M.Tech/ Ph.D. students, faculty members and industry participants. The course program includes detailed lecture/ tutorial modules together with Mini-projects in MATLAB. Lecture notes, tutorial assignments, solutions and MATLAB code will be provided to the participants. A partial list of topics intended to be covered is given below

1. Introduction to MIMO Systems
2. Channel Estimation for MIMO Systems
3. Multi-user MIMO Wireless Systems
4. Introduction to Massive MIMO
5. Generalized Spatial Modulation
6. Rate Scaling/ Spectral Efficiency of Massive MIMO
7. Channel Estimation for Massive MIMO
8. Spectral Efficiency with Imperfect CSI
9. Multi-Cell Massive MIMO, Pilot Contamination
10. Introduction to OFDM Technology
11. IFFT/ FFT Processing for OFDM
12. MIMO OFDM and Transceiver Architecture
13. PAPR Techniques for OFDM Systems
14. Mini Project 1: Channel Modeling and BER Performance
15. Mini Project 2: Multi-Antenna Wireless Systems, Multi-User MIMO
16. Mini Project 3: Massive MIMO Systems, Spatial Modulation
17. Mini Project 4: OFDM, IFFT/ FFT Processing, MIMO-OFDM

I request to kindly display the enclosed course flyer in your institution. More details regarding the course can be found at URL below

<https://www.iitk.ac.in/mwn/hyderabad/index.html>

Thanking you,

  
(Prof. Aditya K. Jagannatham)  
Professor  
EE Department  
IIT Kanpur  
e-mail: [iitk5G.hyd@gmail.com](mailto:iitk5G.hyd@gmail.com)