Signal Processing for 5G Massive MIMO Wireless Systems

January 28th to 30th, 2017

Organized by Department of Electrical Engineering IIT Kanpur

IMPORTANT INFORMATION FOR THE SHORT COURSE AT IIT KANPUR

Note: Campus maps of IITK are given at the end of the document. You can also view them at following URL:

http://www.iitk.ac.in/oirold/templates/ir/data/maps/IITK_Guide_Map_Front.pdf

Contact Info

Note: Please contact only in case of **emergency**

Narendra Singh	narend@iitk.ac.in	9935290881, 9044635721
Aditya Om	adityao@iitk.ac.in	9009871819, 7390099228

How to reach IIT Kanpur

Kanpur is connected by rail and road with the major cities in India. IIT Kanpur is located at a distance of about 16 kilometers from the Kanpur Central Railway Station, in the vicinity of Kalyanpur, Kanpur. **Taxis are available from the Cantt side of the Kanpur Central Railway Station (from Platform number 1 side).** There is a pre-paid auto and taxi booth. **The rates are about Rs. 400/- to 450/- for a taxi and Rs. 250/- for an auto-rickshaw.** Sometimes you may be able to negotiate a few rupees less with the driver, if you don't go to the pre-paid booth. For taxi services you can also call the following taxi agencies located at IIT Kanpur.

Amit Travels	9335515647/ 9369317374
Surendra Yadav Taxi Services	9936051842
Rajpal Yadav Tours and Travels	9336217156
Mr. Beer Singh	9415486472/9936621435
Mr. Bhanu Pratap	9336222326/9336339396

Important Note: Please note that **Visitor Hostel Extension** is **NOT the same as Visitor Hostel**. Accommodation for all participants is either in Visitors Hostel or Visitors Hostel Extension. Participant list with allotted accommodation has been displayed on the website. Please make sure that you get down **only at your allotted accommodation venue** and not at the IIT gate.

Please note that transportation has to be arranged by the participant and the associated charges have to be borne by the participant. These are not covered in the registration fees.

Air connectivity

Visitors coming over to Kanpur have to get down at Lucknow Airport, Lucknow, capital of the state of Uttar Pradesh, India. One can avail the taxis at the airport taxi-stand, but they can ask for any arbitrary amount. You can use the taxi service numbers listed above to book a taxi in advance. **Depending on the type of vehicle, these taxis will charge between Rs 1600/- and Rs. 2000/-. (Charge for Air-conditioned taxi is only Rs. 100/- to 200/- extra.)**

Accommodation Information

Accommodation for the participants is provided in the Visitors Hostel and Visitors Hostel Extension. **Please check your EXACT accommodation venue and reach directly.** The phone numbers and contact persons for various accommodation venues are given in the accommodation list.

Please note that because of the tight accommodation situation at IIT Kanpur, participants are strongly encouraged to arrive only on or after the evening of 27th January and depart by evening of 30th January or latest by morning of 31st January. The short course ends at 5:15 PM on 30th January, 2017.

All participants should come individually. Accommodation is available on a **sharing** basis only for all registered participants on a payment basis. Due to the tight accommodation situation at IIT Kanpur, requests for individual accommodation or accompanying friends/ family members will NOT be entertained. Pairing will be done of Male/Male and Female/Female participants only.

Also note accommodation is NOT included in the registration fees. Please pay amount for accommodation directly at venue.

Breakfast/ Meals Information

Please note Visitors Hostel Extension does NOT have dining facilities. Participants have to bear food expenses. Participants can have breakfast, lunch and dinner in one of the student halls at IIT Kanpur, Hall 1-10 for Male Participants and GH-1, GH-Tower for female participants. Map showing various Hall locations is given at end of document. Timings are as follows.

Breakfast: 7:30 AM to 9:00 AM

Lunch: 12:30 PM to 2:00 PM

Dinner: 7:30 PM to 9:00 PM

The closest halls to the Visitors Hostel are Hall 4 for male and GH-1 for female attendees. Closest hall to Visitors Hostel Extension is Hall 2.

In addition, each hall has a **canteen** facility which opens around 2:00PM in the afternoon and stays open until around 2:00 AM in the morning. Participants can also choose to have meals here.

You can also book your dinner in the main **Visitors Hostel**. However, this is slightly expensive.

In addition there are a variety of food outlets in and around IIT Kanpur. Their location, timing details with contact information are given below.

Food outlet	Location/ Timing	Phone Number
Campus Restaurant	Shopping Complex, IIT Kanpur (11 AM – 11 PM)	9369269370, 0152-2596509
China Town	IIT Gate, IIT Kanpur (12 PM – 11 PM)	9935530022, 8009998999
Malgudi Days	Sundar Shopping Complex, IIT Gate, IIT Kanpur (11 AM – 10 PM)	8400463586, 0512-2570617
Highway Ceremony	Near IIT Kanpur Gate, IIT Kanpur (12 PM – 12 AM)	7897605055
Food Court, IIT Kanpur : New SAC, IIT Kanpur (10 AM – 4 AM)		
Kathi.inc		9838736935
Domino's		
Wazwan foods		8756660077
Crown Burgers		7619823555

The venue for the lecture part of the short course is the PBCEC Building (Big Classroom) adjacent to the main Visitors Hostel.

Course folder, stationary and printed course material will be provided on 28th January morning during the registration session starting at 8:45 AM. Course certificate and receipt for the short course registration will be given only to those who attend all modules of the course and after all the payment dues are cleared.

Please bring a scientific calculator along with you to participate in problem solving during lectures and tutorial sessions.
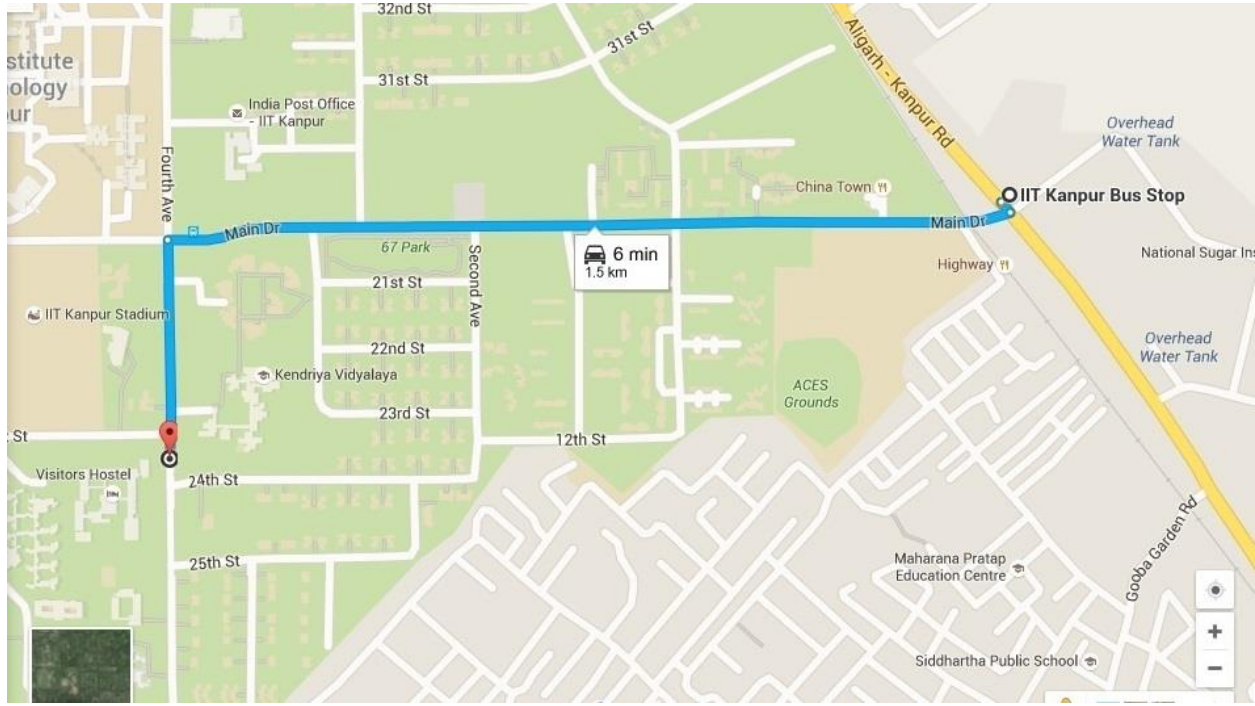
Tentative Schedule

The tentative schedule for the duration of the short course from 28th to 30th January is available online at:

http://www.iitk.ac.in/mwn/massive/programme.html

January 28th, 2017, Saturday (Day 1)	
09:00 AM- 10:15 AM	Introduction to MIMO Wireless Communication Systems
10:15 AM- 10:45 AM	Tea Break
10:45 AM- 12:15 PM	Channel Estimation for MIMO Systems
12:15 PM- 02:00 PM	Lunch Break
02:00 PM- 03:15 PM	Tutorial and Problem Solving Session – MIMO Systems
03:15 PM- 03:45 PM	Tea Break
03.45 PM- 05:15 PM	Multi-user MIMO Wireless Systems
January 29th, 2017, Sunday (Day 2)	
09:00 AM- 10:15 AM	Introduction to Massive MIMO Wireless Systems, Rate Scaling and Spectral Efficiency of Massive MIMO Systems
10:15 AM- 10:45 AM	Tea Break
10:45 AM- 12:15 PM	Channel Estimation for Massive MIMO Systems, Spectral Efficiency with Imperfect CSI
12:15 PM- 2:00 PM	Lunch Break
02:00 PM- 03:15 PM	Tutorial and Problem Solving Session – Multi-user MIMO, Rate Scaling for Massive MIMO
January 30th, 2017, Monday (Day 3)	
09:00 AM- 10:15 AM	Generalized Spatial Modulation
10:15 AM- 10:45 AM	Tea Break
10:45 AM- 12:15 PM	Low Complexity Decoding for Massive MIMO Systems
12:15 PM- 2:00 PM	Lunch Break
02:00 PM- 03:15 PM	Tutorial and Problem Solving Session – Generalized Spatial Modulation, Low Complexity Decoding
03:15 PM- 03:45 PM	Tea Break

[Map Showing Route From IITK Main Gate to Visitor Hostel]

[Map Showing Route From IITK Main Gate to Visitor Hostel Extension]