Institute of Space Technology
Islamabad

MIMO/OFDM based Advanced 4G Cellular Networks

Instructor: Dr Aamir Habib
September 10-11 2013

Course Description:

Orthogonal Frequency Division Multiplexing (OFDM) and Multiple-Input Multiple-Output (MIMO) are cutting edge physical layer technologies slated to be employed in 4G wireless cellular standards such as 3GPP Long Term Evolution (LTE/LTE-A), Worldwide Interoperability for Microwave Access (WiMAX) and high speed WLAN standards. Such 4G cellular standards are envisaged to support data rates in excess of 100 Mbps through OFDMA, MIMO, dynamic carrier aggregation and thus enable a diverse plethora of applications in the wireless ecosystem such as broadcast/multicast video, HDTV on demand, high speed internet access, interactive gaming amongst others.

This course is intended to provide practicing engineers, telecom teachers and graduate students in wireless with an in depth exposure to MIMO, OFDM in addition to introductory tutorials on the upcoming wireless cellular standards of LTE and WiMAX. The modular approach provides the participants with a comprehensive treatment of several aspects of the latest wireless standards and technologies while emphasizing both the theoretical and practical aspects of such systems. The initial modules will familiarize the participants with an overview of wireless communications and provide a detailed expose of MIMO, OFDM and OFDMA. This will be followed by individual modules on LTE, WiMAX elaborating several aspects of these 4G standards. A MATLAB demonstration module will introduce the participants to the practical implementation aspects of such MIMO, OFDM systems.

Who Should Attend?

- Practicing wireless system engineers.
- Graduate students pursuing research in wireless communications.
- Teachers of engineering colleges.

About the Instructor:

Dr. Aamir Habib received his Ph.D. degree from Vienna University of Technology Austria. Currently, he is Assistant Professor at the Electrical Engineering Department and head of research group WiCom in the department of Electrical Engineering. His research interests are in the areas of communications theory and systems, mobile communications. He has been also actively involved in different research projects in the field of Wireless Communications and Satellite Communications. He has been working for the communication sub-system design of small satellite project, ICUBE, of IST. Apart from that, he has been teaching various subjects at graduate level and supervising other projects. He has been recently also involved in projects related to Robotics and its applications. He has over ten years of experience teaching courses on wireless communications and has published extensively in reputed journals and conferences.

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Pre-requisites:

Degree in the area of Electrical Engineering, Telecomm Engineering, wireless networks or computer related field.

Lunch, Tea and light refreshment will be served during the course

Outline:

Topic
Day 1
Digital Communications
Wireless Fading Channel and Diversity
Multiple-Input Multiple-Output (MIMO) Wireless Systems
Orthogonal Frequency Division Multiplexing (OFDM)
Convex Optimization in Wireless Communications
Orthogonal Frequency Division Multiple Access (OFDMA) and Proportional Fairness
Advanced Channel and Space-Time Coding for 4G Wireless Systems
Multi-user MIMO

Day 2

- Simulation of MIMO/OFDM in MATLAB/Simulink
- 3GPP 4G Long Term Evolution (LTE)
- 4G WiMAX
- Simulation of LTE Physical layer
- Simulation of 4G WiMAX
- 5G networks and evolution

Institute of Space Technology

Professionals	Students
Fee: Rs. 15,000/-	Fee: Rs. 7,000/-

Timings:
09:00 am - 04:00 pm

Venue:
Institute of Space Technology.
Near Rawat Toll Plaza, Islamabad Highway,
Islamabad.

INSTITUTE OF SPACE TECHNOLOGY ISLAMABAD

REGISTRATION FORM

I apply for admission to the above course. Course fee payable through bank draft or pay order payable to Institute of Space Technology, Islamabad is enclosed.

Name: _____

Organization: _____

Position: _____

Qualification: _____

Address: _____

_____

Tel No.: _____

e-mail: _____

Signatures: _____ Date: _____

Completed form should be returned to:

Course Coordinator
Institute of Space Technology
Near Rawat Toll Plaza, Islamabad Highway,
Islamabad 44000
Telephone: (051) 9075489, 9075428
aamir.habib@ist.edu.pk
www.ist.edu.pk

Registration:

Requests for participation on the prescribed form (or photocopy) should reach the course coordinator a week prior to the commencement of course. List of selected participants will be uploaded on the website. The final selection, however, is subject to receipt of the formal application. Forms can be downloaded from http:// www.ist.edu.pk

IST Professionals Registration Fee: Rs. 10,000
IST Students Fee: Rs. 5000

For further information, please contact:
Course Coördinator
Telephone: (051) 9075489
(051) 9075428

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Professional Development Short Course

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