NOC:Fundamentals of MIMO Wireless Communication - Video course

COURSE OUTLINE

This course covers the fundamentals of Multiple input multiple output (MIMO) antenna based wireless communication systems. MIMO is now an essential part of modern wireless communication systems, such as 3G, 4G, WLAN / Wifi, LTE, WiMax, etc. MIMO brings to the domain of wireless communications, spectral efficiency and reliability gains. With multiple antennas at the transmitter and receiver it helps design wireless communication systems that can use the additional spatial dimension over and above the well investigated time-frequency dimensions to fetch myriads of new gains. MIMO is expected to be one of the enabler of 5G communication systems. This course covers important concepts of MIMO communication such as capacity computation, error probability analysis, transmitter and receiver design, multi-user communication, etc. After completion of the course the participants will be able to apply the methods for performance analysis and design of advanced wireless communication systems

COURSE DETAIL

Week	Topics
1	Introduction to wireless communication systems and wireless channels.
2	Wireless channel models.
3	MIMO channel model.
4	Information Theory basics for MIMO communication.
5	Capacity of MIMO Communication systems.
6	Diversity performance of MIMO channels.
7	Space Time Coding schemes.
8	Multi-user MIMO communications.

NP-TEL

NPTEL

http://nptel.ac.in

Electronics & Communication Engineering

Pre-requisites:

Digital Communications, Signals and Systems, Basics of Linear Algebra

Coordinators:

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References:

1. Principles of Mobile Communications by G. Stuber, Springer, 2nd ed..
2. Wireless Communications by A. Goldsmith, Cambridge
3. Introduction to Space Time Wireless Communications by A. Paulraj, Nabar and Gore
4. Space Time Wireless Communication Systems,byBolskei, Gesbert, et al.
5. MIMO wireless communications, by Biligeri, et al.
6. Space Time Coding, by Jafarkhani
7. LTE, UMTS and The Long Term Evolution by Sesia, Toufik and Baker
8. OFDM for Wireless Communications by R. Prasad
9. UMTS for LTE by Holma and Toshala
10. Adaptive PHY-MAC Design for Broadband Wireless Systems by R. Prasad, S. S. Das and Rahman
11. Single and Multi Carrier MIMO Transmission for Broadband Wireless Systems by R. Prasad, Rahman and S. S. Das.