Course ID
5GCOMP
Course Duration
4 days

Course Title
5G Wireless: State-of-the-art of Research, Policy, and Standards

Course Type
Private Class

Related Courses

- 5G Wireless: A Fast-Paced Tutorial (5GTUTE, 1 day)
- 5G Wireless: Federal and Defense Applications and Implications (5GSEC, 1 day)
- 4G Technologies & Services: For All Audiences (W-4G, half day)
- 4G Enablers - OFDM and MIMO: For Technical Audiences (W-ENB, half day)
- Principles of OFDM and MIMO (3 day(s), OM)
- LTE Explained: For All Audiences (W-LTE1, half day)
- LTE Technology: For Technical Audiences (W-LTE2, 2 half days)
- WiMAX Explained: For All Audiences (W-WMX1, half day)
- WiMAX Technology: For Technical Audiences (W-WMX2, 2 half days)
- LTE: Technology, Business, and Competitive Landscape (2 day(s), LTE-BIZ)
- LTE: A Comprehensive Tutorial (LTE-CT, 3 days)
- LTE: A Comprehensive Three Day Course (LTE-C3DC, 3 days)
- WIMAX: A Comprehensive Three Day Course (WIMAX-C3DC, 3 days)

Aimed At

This course is intended for those with background in wireless communications who wish to keep abreast of the evolving technologies, spectrum policy, and standards of 5G wireless.

Group Size

5-25

Prerequisites

Those wishing to take this course should have a basic knowledge of the current wireless communications systems and standards.

Course in a Nutshell

While 4G wireless networks will continue to evolve and be deployed for some time to come, the researchers, hardware and software designers, defense and homeland security experts, public safety and law enforcement, spectrum regulators, and others are already hard at work defining the contours and understanding the implications of the next generation of wireless technologies.

This exciting course provides a comprehensive overview of the core 4G/5G technologies, emerging research areas that are supporting the technologies that will develop into the 5G wireless standards, and the existing and evolving government regulatory policies that are influencing both national and international acceptance of the next-generation standards. This course is taught by a 5G researcher actively involved in pushing the state-of-the-art and is continually updated to reflect the evolving technology landscape. You will go away from the course having acquired an appreciation of the major forces that are shaping the evolution of 4G wireless to 5G.

Customize It!

We can customize the content, duration, and tech level of this course at no additional cost to meet the varying needs of audiences such as business and technology planners and strategists, engineers, managers and executives, defense and homeland security personnel, spectrum regulators, and others trying to understand what 5G wireless is and what it means for their profession.

For those working in the defense and homeland security sectors, customization can potentially include the inclusion of restricted content, subject to the availability of suitable classroom facilities and an approval from the cognizant federal authority.

Learn How To

- Describe the key 5G technologies, including software-defined radio and cognitive radio
- Characterize the state-of-the-art of 5G wireless research
- Describe the policy and regulatory changes supporting 5G development and adoption

Course Outline

- Review of Core 4G Wireless Technologies
  - History of Wireless Technologies: 1G, 2G, 3G
  - 4G Wireless Technologies
    - OFDM and OFDMA
    - MIMO
  - 4G Wireless Standards
    - WiMAX
    - 4G Long Term Evolution (LTE)
    - IP Multimedia Subsystem (IMS)
    - Applications: SIP and VOIP
- Core 5G Wireless Technologies
  - Software-Defined Radio
  - Cognitive Radio
  - Dynamic Spectrum Access (DSA)
- 5G Wireless Standards
  - DSA modes for WiFi and WiMAX
  - P1900.1
  - IEEE 802.22
  - Whitespace and WhiteFi
  - Wireless Innovation Forum
- Emerging 5G Wireless Research
  - Spectrum Metrics
    - Spectrum Value
    - Spectrum Efficiency
  - Interference Approaches
    - Interference Avoidance
    - Interference Mitigation

        - Interference Tolerance
    - Reconfigurable Radio Hardware
        - Tunable Filters
        - RFICs
        - Wideband ADC/DACs
    - Security Issues
        - Quality of Service in Congested Environments
        - SDR Platform Security
        - Cognitive Radio Security
        - Efficient Jamming Attacks
    - Spectrum Markets
        - Primary and Secondary Markets
        - Incentive Auctions
        - Real-Time Markets

- Emerging Policy
    - Recent FCC Policy
        - Interference Temperature
        - Whitespace
        - 700 MHz Spectrum Auction and Controversy
        - Digital Television
    - Public Safety
        - Spectrum Policy
        - Device Issues
        - Interoperability
    - Obama's National Broadband Plan
        - Wireless Innovation and Infrastructure Investment Bill
        - Wireless Innovation Fund
        - Public Safety Trust Fund and Proposed Public Safety Broadband Corporation
        - Proposed Research Programs
    - International Policy
        - ITU
        - NATO
        - European Regulators

- Wrap-up
    - Course Recap and Q/A
    - Evaluations

How You Will Learn

- A researcher who is at the forefront of the development of 5G wireless technologies will present this course in interactive lecture format.
- Along with the lecture, we will use discussion and group activities to enrich the instruction and communicate the essential points.
- If you already know something about the evolving 5G technologies, we will build on that knowledge base. We'll compare and contrast what's familiar with what's new, making the new ideas easier to learn as well as more relevant.
- If your background is less technical, we will use meaningful and ingenious examples and analogies to simplify the complex subject matter.
- You will receive a printed Participant Handbook which will help you remember and retain what you learned in class and apply it on your job.

Revised *Sept 8, 2011*