

COURSE ON

LARGE SCALE RADIO PROPAGATION

Braunschweig, Germany, September 28 – October 2, 2015



Source: Braunschweig Stadtmarketing GmbH / Steffen und Bach GmbH

The course on *Large Scale Radio Propagation* will be held at Institut für Nachrichtentechnik at Technische Universität Braunschweig in the framework of the European School of Antennas 2015. The course will cover propagation aspects for cellular and vehicular communication. Starting with the basics of propagation, modern methods used in cellular network planning as well as aspects relevant for future 5G networks, e. g. MIMO, multi-link aspects, localisation, car2X and railway communication, are taught. The course includes also computer-based exercises and demonstrations of state-of-the-art measurement systems for cellular networks. The teachers are from University of Bologna, Technische Universität Braunschweig, Karlsruhe Institute of Technology and Université Catholique de Louvain.

Course fees :	University Student (full time Master or Ph. D. student) :	440 €
	Any other participant	880 €

Location : Technische Universität Braunschweig, Institut für Nachrichtentechnik
Room, SN 22.2, Schleinitzstr. 22, 38106 Braunschweig, Germany
<https://www.ifn.ing.tu-bs.de/en/ifn/general/location/>

Further information : http://www.antennasvce.org/Community/Education/Courses?id_folder=570

Contact : Prof. Dr. Thomas Kürner, E-Mail : t.kuerner@tu-bs.de

Course Schedule

Monday , 28.9.15:

9.00 – 10.00 h	<i>Welcome, Introduction, Overview, Mobile and Wireless Communication Systems</i> Prof. Thomas Kürner, Technische Universität Braunschweig
10.00 – 10.30 h	<i>General Theory of Propagation: Physical Aspects (laws of Reflection, Diffraction, etc.), Part I</i> Prof. Franco Fuschini, University of Bologna
10.30 – 11.00 h	Coffee Break
11.00 - 12.30h	<i>General Theory of Propagation: Physical Aspects (Laws of Reflection, Diffraction, etc.), Part II</i> Prof. Franco Fuschini, University of Bologna
12.30 – 13.30 h	Lunch Break
13.30 – 15.00 h	<i>Multipath Propagation : Stochastic and Multidimensional Aspects (Rayleigh, Rice, Channel Transfer Functions, Spreading in Time, Angles, Selectivity in Frequency, Space, Multidimensional Parameters,Part I</i> Prof. Franco Fuschini, University of Bologna
15.00 – 15.30 h	Coffee Break
15.30 – 17.00 h	<i>Multipath Propagation : Stochastic and Multidimensional Aspects (Rayleigh, Rice, Channel Transfer Functions, Spreading in Time, Angles, Selectivity in Frequency, Space, Multidimensional Parameters,Part II</i> Prof. Franco Fuschini, University of Bologna
17.00 - 18.00 h	<i>Computer-Based Exercise on Channel Modeling</i> tbd, Technische Universität Braunschweig

Tuesday, 29.9.15:

9.00 – 10.30 h	<i>GIS Data for Radio Network Planning</i> Prof. Thomas Kürner, Technische Universität Braunschweig
10.30 – 11.00 h	Coffee Break
11.00 - 12.30h	<i>Localisation Part I</i> Prof. Franco Fuschini, University of Bologna
12.30 – 13.30 h	Lunch Break
13.30 – 15.00 h	<i>Localisation Part II</i> Prof. Franco Fuschini, University of Bologna
15.00 – 15.30 h	Coffee Break
15.30 – 17.00 h	<i>Path Loss Modeling for Cellular Networks</i> Prof. Thomas Kürner, Technische Universität Braunschweig
17.00 - 18.00 h	<i>Demonstration of Coverage Measurement System for Cellular Networks</i> Dennis M. Rose, Technische Universität Braunschweig

Wednesday, 30.9.15:

9.00 – 10.30 h	<i>Coverage Planning and Planning Tools</i> Prof. Thomas Kürner, Technische Universität Braunschweig
10.30 – 11.00 h	Coffee Break
11.00 - 12.30h	<i>Channel Sounding and Estimation Techniques</i> Prof. Claude Oestges, Université Catholique de Louvain
12.30 – 13.30 h	Lunch Break
13.30 – 15.00 h	<i>MIMO Channels from directional multipaths to MIMO matrices : steering vectors, eigenvalues, MIMO models, beamforming, massive MIMO, etc.)Part I</i> Prof. Claude Oestges, Université Catholique de Louvain
15.00 – 15.30 h	Coffee Break
15.30 – 17.00 h	<i>MIMO Channels from directional multipaths to MIMO matrices : steering vectors, eigenvalues, MIMO models, beamforming, massive MIMO, etc.)Part II</i> Prof. Claude Oestges, Université Catholique de Louvain
17.00 - 18.00 h	<i>Computer-Based Exercise on Coverage Planning</i> Dennis M. Rose, Technische Universität Braunschweig

Thursday, 1.10.15:

9.00 – 10.30 h	<i>Cellular Channels : Stochastic Models</i> Prof. Claude Oestges, Université Catholique de Louvain
10.30 – 11.00 h	Coffee Break
11.00 - 13.00 h	<i>Cellular Channels : Multi-Link Aspects</i> Prof. Claude Oestges, Université Catholique de Louvain
13.00 – 14.00 h	Lunch Break
14.00 – 15.30 h	<i>Propagation and Channel Modeling for Car2X Communciation, Part I</i> Prof. Werner Wiesbeck, Karlsruhe Institute of Technology
15.30 – 16.00 h	Coffee Break
16.00 – 17.30 h	<i>Propagation and Channel Modeling for Car2X Communciation, Part II</i> Prof. Werner Wiesbeck, Karlsruhe Institute of Technology

Friday, 2.10.15:

8.30 – 10.00 h	<i>Propagation Modeling for High-Speed Railways</i> Prof. Thomas Kürner, Technische Universität Braunschweig
10.00 – 10.30 h	Coffee Break
10.30 - 12.30 h	<i>Final Exam</i>
12.30 – 14.00 h	Lunch Break
14.00 – 14.30h	<i>Wrap-up and distribution of certificates</i>

Note : The final exam will include an evaluation with a score. The score will be used to select students for grants