

4G and 5G + wireless network architectures

Seminars

Winter semester 2025/2026

1. Basic system parameters of mobile communication systems.
2. Analysis of OFDM system.
3. PAPR, ISI and SNR in mobile communication systems.
4. Channel capacity in mobile communication systems.
5. Range analysis of wireless communication systems.
6. BER analysis of mobile communication systems and LTE throughput.
7. Interference in mobile communication systems and timing advance.
8. Cellular network - sectorization and interference from adjacent channels.
9. Analysis of system parameters of LTE system part I.
10. Analysis of system parameters of LTE system part II.
11. Analysis of system parameters of LTE system part III.
12. Dimensioning of the radio part of LTE.

Credit conditions: a maximum of 2 excused absences with a medical certificate.

For active participation in seminars (= solving assignments) students can get points, which are added to the exam so that the total number of points is max. 100.

Recommended literature:

1. Dahlman, E., Parkvall, S.: 5G NR: The Next Generation Wireless Access Technology, Elsevier, 2020.
2. Dahlman, E., Parkvall, S., Skold J.: 4G, LTE-Advanced Pro and The Road to 5G, Elsevier, 2016.
3. Dahlman, E., Parkvall, S., Skold, J.: 4G LTE/LTE - advanced for mobile broadband, Elsevier, 2011.

Bratislava, 16.9.2025

Leader of the seminars



Assoc. Prof. Ing. Martin Rakús, PhD.