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SLOVAK UNIVERSITY OF
TECHNOLOGY IN BRATISLAVA
Faculty of Electrical Engineering and Information Technology
Institute of Multimedia Information and Communication
Technologies

Working title of the subject	4G and 5G + wireless network architectures
For which study program	SP Multimedia ICT
For which year	2. year 2. degree
For which semester	winter semester
Hours allowance (lecture / seminar)	2/2
Form of teaching	daily full - time
Provided by the institute	I-MICT
Lecturer	Assoc. Prof. Ing. Martin Rakús, PhD.

Abstract: the student will get acquainted with the current state and perspectives of mobile systems LTE, LTE-A and LTE-A Pro, with the classification of these systems as well as with the basic system parameters. The focus of the course lies in the principles of solving the architectures of mobile systems and networks LTE, LTE-A, LTE-A Pro and 5G. The course builds on the subjects: Design of wireless telecommunications networks, Digital Communications II. and Wireless communications.

Course contents - syllabi:	
1.	Introduction, history and overview of mobile systems 0G to 4G.
2.	OFDM technology.
3.	High-speed data transmission in mobile communication systems.
4.	Architecture LTE: 3GPP Release 8.
5.	Architecture LTE: 3GPP Release 8.
6.	Architecture LTE: 3GPP Release 8.
7.	Architecture LTE: 3GPP Release 9, 10 – LTE-A.
8.	Architecture LTE: 3GPP Release 11, 12.
9.	Architecture LTE: 3GPP Release 12, 13 – LTE-A-Pro.
10.	Architecture LTE: 3GPP Release 14 – beginning of 5G, Release 15.
11.	Architecture LTE: 3GPP Release 16.
12.	Architecture LTE: 3GPP Release 17, 18, perspectives of future development - Release 19 , 20

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

Course completion conditions:

seminars: a maximum of 2 excused absences with a medical certificate.

exam: written part plus oral part, total 100pts

To successfully complete the course, the student must obtain at least 56pts.

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in Bratislava 16. 9. 2025

Assoc. Prof. Ing. Martin Rakús, PhD.