

Tárgytematika / Course Description

Mobile Communications and Smart Networking

GKNM_TATA063

Tárgyfelelős neve /

Teacher's name: Kiss Tamás Imre

Félév / Semester: 2024/25/2

Beszámolási forma /

Assesment: Vizsga

Tárgy heti óraszám /

Teaching hours(week): 4/0/0

Tárgy féléves óraszám /

Teaching hours(sem.): 0/0/0

OKTATÁS CÉLJA / AIM OF THE COURSE

The subject gives overview of the mobile communication system from like GSM, LTE and 5G and their main use cases. Students will learn the main architectural elements of the mobile network. They will get knowledge about the characteristics and functions of the network elements

TANTÁRGY TARTALMA / DESCRIPTION

Topics of course unit	
1.hét Február 10	<p>Overview of mobile communications from 1G to 5G. International and Hungarian trends of Mobil Telecommunication. International and Hungarian frequency management. Definition of wireless and n communications.</p> <p>Basics of mobile networks (characteristics and the function of the radio and core network), concept frequency reuse, cell cluster, coverage, capacity, quality, roaming and handover. Digital modulations and characteristics. Shannon theorem.</p> <p>Communication model of mobile communication.</p>
4. hét Március 3.	<p>Digital modulations and their characteristics. Shannon theorem.</p> <p>Network architecture and characteristics of GSM system I. (Architecture of GSM system, function network elements, Signal processing of GSM)</p> <p>Network architecture and characteristics of GSM system II. (Call cases, types of GSM handovers, capacity planning of GSM)</p>
7. hét Március 24.	<p>Written Test I. Architecture and Characteristics of LTE network I. (Requirements of LTE system. High architecture of LTE network, comparison of LTE and GSM architecture.</p> <p>Architecture and characteristics of LTE network II. (Properties of LTE air interface, frequency band technology, concept of MiMo)</p>
11.hét Április 21.	<p>Drivers of 5G technology, main use cases, 5G frequency bands and their properties, dynamic frequency 5G network architecture (non standalone, standalone), 5G core network, 5G air interface, access technology 5G massive MiMo, 5G deployment strategies, Migration from LTE to 5G, network synchronization</p>
14.hét Május 12.	<p>Written Test II. Review of the semester, Discussion of exam items</p>

SZÁMONKÉRÉSI ÉS ÉRTÉKELÉSI RENDSZERE / ASSESSMENT'S METHOD

During the semester, 2 written exam at a pre-defined time. The condition for signing the semester: the

average of the WrittenExams is at least sufficient (2).

KÖTELEZŐ IRODALOM / OBLIGATORY MATERIAL

Presentations of the lessons

AJÁNLOTT IRODALOM / RECOMMENDED MATERIAL