COURSE DESCRIPTION CARD - SYLLABUS

Course name
Mobile and wireless technologies [S2Teleinf2-SDP>TM]

Course

Field of study
Teleinformatics

Year/Semester
1/2

Area of study (specialization)
Software-defined systems

Profile of study
general academic

Level of study
second-cycle

Course offered in
Polish

Form of study
full-time

Requirements
compulsory

Number of hours

Lecture
14

Laboratory classes
24

Other
0

Tutorials
0

Projects/seminars
0

Number of credit points

3,00

Coordinators

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Lecturers

Prerequisites

A student starting this subject should have basic knowledge of digital transmission systems and radio transmission methods.

Course objective

The aim of the course is to familiarize the student with the latest mobile communication technologies, such as the latest generations of cellular systems and the so-called "cell-free", communication systems between vehicles, unmanned aerial vehicles and wireless communication of the Internet of Things.

Course-related learning outcomes

Knowledge:
1. A student has in-depth knowledge of the construction and operation of modern mobile and radio communication systems and the construction of devices and networks used in them [K2_W02].
2. A student knows the limitations of the use of these systems related to the occurrence of characteristic propagation phenomena, the Doppler effect, interference and the type of telecommunications traffic [K2_W02, K2_W05, K2_W11].
3. A student understands the methodology and specificity of designing mobile communication systems

[K2_W04].

Skills:
1. A student is able to design a radio link between moving objects [K2_U06, K2_U07].
2. A student is able to compare mobile systems and propose improvements or alternatives to existing solutions [K2_U09,K2_U14].
2. A student is able to assess the usefulness and possibility of using specific mobile transmission techniques for specific applications [K2_U10, K2_U16].

Social competences:
1. A student understands the importance of mobile telecommunications solutions for the development of the information society and the quality of these solutions to ensure global connectivity [K2_K01, K2_K06, K2_U17].

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

The knowledge acquired during the lectures is verified on the basis of a written or oral assessment. It consists of 5 open questions scored equally. The passing threshold is 50% of points. The skills acquired during laboratory classes are verified on the basis of reports from completed exercises. It is required to obtain at least 50% of the maximum number of points.
Grading scale: <50% - 2.0 (ndst); 50% to 59% - 3.0 (dst); 60% to 69% - 3.5 (dst+) ; 70% to 79% - 4.0 (db); 80% to 89% - 4.5 (db+); 90% to 100% - 5.0 (bdb).

Programme content

1. Introduction. Modern radio systems.
2. The latest generations of cellular and cell-free systems and the techniques used.
3. The role of intelligent detection and prediction (spectrum, location, trajectory) in mobile systems.
4.V2V, V2X inter-vehicle communication systems.
5. Communication systems with unmanned aerial vehicles (UAVs).
6. Mobile Internet of Things communication methods.
7. The latest trends in the development of mobile radio communication.

Course topics

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Teaching methods

Lecture: multimedia presentation, materials available online; stationary/hybrid/online forms of presentation acceptable
Laboratory classes: case study, problem solving.

Bibliography

Basic:
A. S. Molish, Wireless Communications: From Fundamentals to Beyond 5G, Wiley, 3rd Edition
K. Wesołowski, Systemy radiokomunikacji ruchomej, Wydawnicto Komunikacji i Łączności, Wyd. 3, 2006

Additional:
G. Dimitrakopoulos, Current Technologies in Vehicular Communication, Springer Link, 2017

Breakdown of average student's workload

	Hours	ECTS
Total workload	78	3,00
Classes requiring direct contact with the teacher	38	1,50
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	40	1,50