



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Radio communication measurements [S1MiKC1>PwR]

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### Course

Field of study	Year/Semester
Microelectronics and digital communications	3/5
Area of study (specialization)	Profile of study
–	general academic
Level of study	Course offered in
first-cycle	Polish
Form of study	Requirements
full-time	compulsory

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### Number of hours

Lecture	Laboratory classes	Other
0	20	0
Tutorials	Projects/seminars	
0	0	

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### Number of credit points

2,00

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### Coordinators

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### Lecturers

### Prerequisites

A student starting this course should know the basics of the theory of signal transmission and processing and have knowledge of the spectral properties of signals. He should also have the ability to obtain information from indicated sources, especially catalog notes for measuring devices, and be ready to cooperate within a team. He should also know issues related to radio propagation, in particular propagation models.

### Course objective

The aim of the course is to provide students with practical skills related to measuring signals, devices and systems used in radio technologies. This course is intended to prepare students to independently plan and perform measurement experiments, interpret the results and assess the quality and correct operation of devices in radio communication systems.

### Course-related learning outcomes

## Knowledge:

The student knows and understands the principles of operation of measuring devices used in radio communications, methods of measuring radio signal parameters and the basic phenomena affecting the quality of transmission in wireless systems.

## Skills:

1. The student is able to independently measure the parameters of radio signals and radio communication systems, using appropriate measuring instruments.
2. The student is able to independently plan how to conduct a measurement experiment and prepare a measurement equipment, analyze and interpret measurement results in order to assess the quality of device operation.

## Social competences:

The student is aware of the importance of reliability and accuracy of measurements performed in radio communications and understands the responsibility for the correct interpretation of the results in the context of ensuring the quality and reliability of wireless systems.

## Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Passing the course on the basis of submitted reports and a possible final test at the end of the semester, from which a total of 51% of all possible points should be obtained. 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

Basics of radiocommunication concerns aspects related to radio propagation, its impact on the operation of wireless systems and a discussion of selected examples of radiocommunication systems.

## Course topics

The subject matter of the classes does not exclude an individualized approach to students. The implementation of classes may include a series of tasks performed sequentially or a whole semester of work on solving a given complex problem. Regardless of the detailed form of implementation, the course topics concern various aspects of selected radio communication systems, such as: LTE, 5G, 6G, LORA, 802.11, satellite systems, military systems, RFID, TETRA.

## Teaching methods

Teaching methods: carrying out practical tasks in groups of several people. The tasks concern measuring selected parameters of radio communication systems, developing and analyzing their results.

## Bibliography

### Basic:

1. K. Wesółowski, Systemy radiokomunikacji ruchomej, Wydawnictwa Komunikacji i Łączności WKŁ, Warszawa 2003.
2. J. Szóstka, Miernictwo radiokomunikacyjne, Wydawnictwo Politechniki Poznańskiej, Poznań 2021.

### Additional:

1. S. Salous, Radio Propagation Measurement and Channel Modelling, John Wiley&Sons, 2013.

## Breakdown of average student's workload

	Hours	ECTS
Total workload	60	2,00
Classes requiring direct contact with the teacher	20	0,50
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	40	1,50