COURSE DESCRIPTION CARD - SYLLABUS

Course name
WLAN networks [N2EiT1>SBWLAN2]

Course

Field of study
Electronics and Telecommunications

Year/Semester
2/4

Area of study (specialization)
–

Profile of study
general academic

Level of study
second-cycle

Course offered in
polish

Form of study
part-time

Requirements
elective

Number of hours

Lecture
0

Laboratory classes
15

Other (e.g. online)
0

Tutorials
15

Projects/seminars
0

Number of credit points
2,00

Coordinators

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Lecturers

Prerequisites

The student knows the basics of wireless communication (radiocommunication), cellular networks and signal propagation through different transmission channels

Course objective

The aim of the course is to provide students with knowledge and skills allowing for conscious use, evaluation, comparison and selection of modern wireless networks from the IEEE 802 family on the market and/or being standardized.

Course-related learning outcomes

Knowledge
The student knows the structure, parameters, advantages and disadvantages and the scope of application of various wireless networks (including solutions from the 802.11, 802.15 family)
Skills
The student is able to design, apply and deploy a network according to the 802.11 standard. It can compare the parameters of different wireless networks. Can take a critical stance and get involved in the development of radiocommunication technologies that are in the phase of standardization or scientific

research.
Social competence
The student understands the need to learn about emerging new standards of wireless networks. He understands that the deployment of ever newer networks and radio communication systems requires the cooperation of diverse teams of engineers, understands the challenges faced by radio communications caused by the growing demand for speed and quality of transmission

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

In semester 3:
The knowledge acquired during the lecture is verified by a written (and/or oral) exam consisting of several larger or several short questions, mostly descriptive; the questions are of varying difficulty, with a different number of points assigned to them. Passing threshold - 50% of possible points. The following grading scale is used: <= 50% 2.0; 51%-60% 3.0; 61%-
70% 3.5; 71%-80% 4.0; 81%-90% 4.5; 91%-100% 5.0. Examination issues on the basis of which the questions are developed will be sent to students by e-mail using the university's e-mail system.
In semester 4:
The skills acquired during laboratory classes are verified on the basis of grades from the student's preparation for the laboratory and evaluation of the results of work in the laboratory. The assessment of the student's preparation may take the form of a knowledge test, and the assessment of the results of the work results - on the basis of prepared reports. The final grade takes into account all partial grades obtained, as well as the student's commitment and attitude during classes. It is a necessary condition
obtaining positive grades for most of the laboratory issues. Skills acquired during the exercises verified by a written (and/or oral) test consisting of several larger or several short questions, mostly descriptive; the questions are of varying difficulty, with a different number of points assigned to them. Passing threshold - 50% of possible points. The following grading scale is used: <= 50% 2.0; 51%-60% 3.0; 61%-70% 3.5; 71%-80% 4.0; 81%-90% 4.5; 91%-100% 5.0.

Programme content

Wireless systems, phenomena occurring in the wireless channel, spectrum multiple access methods, MIMO and MMIMO techniques. WiFi wireless network according to IEEE 802.11 recommendations (including a, b, g, n, ac, ax), with particular emphasis on the physical layer (OFDM modulation), data link layer, network layer, as well as issues related to security, management interference, etc. PAN wireless networks (Bluetooth, Zigbee).
Issues related to the design and configuration of WLAN networks, assessment of the type and level of interference, testing and assessment of WALN network performance, network architectures in WALN networks.

Teaching methods

In semester 3:
Lecture: multimedia presentation prepared by the teacher, illustrated with examples given on the board. The lecture is usually conducted in a traditional way, but also partly in the form of a conversation and/or problem lecture
In semester 4:
Exercises and laboratories: tasks performed individually or in groups of 2 people given by the teacher and/or described in the form of laboratory instructions. Practical exercises with the use of equipment available in the laboratory. Analysis of technical documentation and group discussions on selected aspects of network device configuration. Labs and exercises can be supplemented by multimedia presentations or examples given on the board, and
presentations of the results of tasks performed by students.

Bibliography

basic
1. Selected fragments of wireless network standards available in the IEEE digital library.
2. Articles in magazines and on the Internet provided/indicated by the lecturer.
Complementary
1. Any Wi-Fi (802.11) manual available in Polish or English.

2. Any textbook on Bluetooth, Z-Wave, ZigBee, LoRA, TETRA standards

Breakdown of average student's workload

	Hours	ECTS
Total workload	120	4,00
Classes requiring direct contact with the teacher	60	2,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	60	2,00