COURSE DESCRIPTION CARD - SYLLABUS

Course name
Wireless ICT Networks [S1Teleinf1>BST]

Course

Field of study
Teleinformatics

Year/Semester
3/6

Area of study (specialization)
–

Profile of study
general academic

Level of study
first-cycle

Course offered in
Polish

Form of study
full-time

Requirements
elective

Number of hours

Lecture
15

Laboratory classes
15

Other
0

Tutorials
0

Projects/seminars
0

Number of credit points

3,00

Coordinators

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Lecturers

Prerequisites

The student knows the basics of wireless communications (radiocommunications), cellular networks, and signal propagation over various transmission channels.

Course objective

The course aims to provide students with knowledge and skills that allow for the conscious use, assessment, comparison, and selection of modern wireless networks on the market or undergoing standardization.

Course-related learning outcomes

Knowledge:
The student knows the structure, parameters, advantages and disadvantages as well as the scope of application of various wireless networks (e.g. 802.11, 802.15, 802.16, LTE-R, TETRA, WPAN).
The student knows and understands the architecture, protocols, characteristics, parameters, modes of operation, advantages and disadvantages of the most popular wireless network standards.

Skills:

The student can design and apply 802.11 networks. He can compare parameters of various wireless networks. The student can critically analyze wireless technologies under development, which are in the phase of standardization or scientific research.

Social competences:
The student understands the need to learn about the emerging new standards of wireless networks. Understands that the deployment of newer and newer radiocommunication networks and systems requires the cooperation of various teams of engineers; Understands the challenges facing radiocommunication 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:

The knowledge acquired during the lecture is verified by a written or oral exam, or test consisting of a few larger or a dozen short questions, usually descriptive; the questions are of varying difficulty, with a different number of points assigned to them. Passing threshold - 50% of possible points. The following rating 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. Exam topics, on the basis of which the questions are developed, will be sent to students by e-mail or using the university's on-line system.
The skills acquired during the laboratory classes are verified on the basis of the student's preparation for the laboratory and the results obtained in the laboratory. The evaluation of the student's preparation may take the form of a test to check the knowledge, and the evaluation of the results of work - on the basis of prepared reports. The final grade takes into account all the partial grades obtained, as well as the student's commitment and attitude during the classes. The prerequisite is to obtain positive assessments for most of the laboratory issues carried out.

Programme content

Wireless systems, phenomena occurring in the wireless channel, methods of multiple access to the transmission medium, MIMO and MMIMO techniques.
Mobile networks analyzed from the perspective of small cells (as an alternative to WiFi solutions).
WiFi wireless network according to IEEE 802.11 recommendations (e.g. a, b, g, n ac, e, ax) with particular emphasis on the physical layer (OFDM modulation), data link layer, network layers, as well as security issues, etc. Mesh networks, paging networks, trunking networks (TETRA, GSM-R / LTE-R).
PAN wireless networks (Bluetooth, Zigbee, Z-Wave, UWB).
Wireless systems, phenomena occurring in the wireless channel, methods of multiple access to the transmission medium, MIMO and MMIMO techniques.
Mobile networks analyzed from the perspective of small cells (as an alternative to WiFi solutions), i.e.. LTE, 5G. WiFi wireless network according to IEEE 802.11 recommendations (e.g. a, b, g, n ac, e, ax) with particular emphasis on the physical layer (OFDM modulation), data link layer, network layers, as well as security issues, etc. Mesh networks, paging networks, trunking networks (TETRA, GSM-R / LTE-R, 5G).
PAN wireless networks (Bluetooth, Zigbee, Z-Wave, UWB).

Course topics

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PAN wireless networks (Bluetooth, Zigbee, Z-Wave, UWB).

Teaching methods

1. Lecture: multimedia presentation prepared by the teacher, illustrated with examples given on the blackboard. The lecture is usually conducted in a traditional way, but also partly in the form of a seminar or problem lecture.
2. Laboratory exercises: carrying out the tasks given by the teacher and described in the form of laboratory instructions - practical exercises using the equipment available in the laboratory. Laboratories can be fulfilled through multimedia presentations or examples given on the blackboard

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 teacher.

Additional:
1. Any Wi Fi (802.11) manual available in Polish or English.
2. Any manual on Bluetooth, Z-Wave, ZigBee, LoRA, TETRA, LTE, 5G standards.

Breakdown of average student's workload

	Hours	ECTS
Total workload	60	3,00
Classes requiring direct contact with the teacher	34	2,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	26	1,00