



Subject card

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|---|--|--|--|-------------------------------------|--|------------|-----|
| Subject name and code | Wireless Local Networks, PG_00047896 | | | | | | |
| Field of study | Informatics | | | | | | |
| Date of commencement of studies | October 2021 | | Academic year of realisation of subject | | 2023/2024 | | |
| Education level | first-cycle studies | | Subject group | | Optional subject group Subject group related to scientific research in the field of study | | |
| Mode of study | Full-time studies | | Mode of delivery | | at the university | | |
| Year of study | 3 | | Language of instruction | | Polish | | |
| Semester of study | 6 | | ECTS credits | | 2.0 | | |
| Learning profile | general academic profile | | Assessment form | | assessment | | |
| Conducting unit | Department of Computer Communications -> Faculty of Electronics, Telecommunications and Informatics | | | | | | |
| Name and surname of lecturer (lecturers) | Subject supervisor | | dr inż. Krzysztof Gierłowski | | | | |
| | Teachers | | dr inż. Krzysztof Gierłowski | | | | |
| | | | dr inż. Michał Hoeft | | | | |
| | | | mgr inż. Jakub Grochowski | | | | |
| | | | prof. dr hab. inż. Józef Woźniak | | | | |
| Lesson types and methods of instruction | Lesson type | Lecture | Tutorial | Laboratory | Project | Seminar | SUM |
| | Number of study hours | 15.0 | 0.0 | 15.0 | 0.0 | 0.0 | 30 |
| | E-learning hours included: 0.0 | | | | | | |
| Learning activity and number of study hours | Learning activity | Participation in didactic classes included in study plan | | Participation in consultation hours | | Self-study | SUM |
| | Number of study hours | 30 | | 1.0 | | 19.0 | 50 |
| Subject objectives | The aim of the course is to acquaint students with the basic principles of operation of standard wireless networks, as well as elements of the evaluation of the quality of these networks. | | | | | | |
| Learning outcomes | Course outcome | | Subject outcome | | Method of verification | | |
| | [K6_W03] Knows and understands, to an advanced extent, the construction and operating principles of components and systems related to the field of study, including theories, methods and complex relationships between them and selected specific issues - appropriate for the curriculum | | 1. Student identifies characteristics of wireless technologies described by IEEE 802 standards. 2. Student describes mechanisms of IEEE 802-based wireless networks. 3. Student evaluates security level of systems based on these technologies. | | [SW1] Assessment of factual knowledge | | |
| | [K6_U04] can apply knowledge of programming methods and techniques as well as select and apply appropriate programming methods and tools in computer software development or programming devices or controllers using microprocessors or programmable elements or systems specific to the field of study | | 1. Student examines the working efficiency of the IEEE 802.11 and IEEE 802.15.1 series wireless technology. 2. Student assesses the level of security of the above technologies | | [SU1] Assessment of task fulfilment [SU4] Assessment of ability to use methods and tools | | |
| | [K6_W01] Knows and understands, to an advanced extent, mathematics necessary to formulate and solve simple issues related to the field of study | | 1. The student is able to solve simple problems that increase the level of network security. 2. The student has knowledge of real hardware solutions. | | [SW1] Assessment of factual knowledge | | |

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| Subject contents | 1. Classification of wireless networks: Overview of wireless systems 2. Basic features and applications of wireless networks 3. Features and parameters of transmission media, characteristics of radio and optical systems 4. Multiple access techniques (FDMA, TDMA, CDMA, SDMA) 5. Classification of channel access protocols: Evaluation of effectiveness of multiple access techniques 6. Characteristics of contention type algorithms (ALOHA, S-ALOHA, CSMA) 7. WLAN solutions principles of organization and operational modes 8. Standard WLAN solution - IEEE 802.11 9. Evaluation of DCF mode effectiveness CSMA/CA. PCF analysis 10. MAC QoS architecture traffic service differentiation in IEEE 802.11e 11. Selected WLAN design issues implementation and testing of WLANs. Operational modes of WiFi devices 12. Security of IEEE 802.11 - WEP protocol 13. Security of IEEE 802.11 WLANs - WEP and IEEE 802.11i protocols 14. PAN networks: Bluetooth and its profiles 15. Mobility support offered by MIP | | |
| Prerequisites and co-requisites | Computer Networks | | |
| Assessment methods and criteria | Subject passing criteria | Passing threshold | Percentage of the final grade |
| | Midterm colloquium | 50.0% | 50.0% |
| | Practical exercise | 50.0% | 50.0% |
| Recommended reading | Basic literature | Nowicki K., Woźniak J.: Przewodowe i bezprzewodowe sieci LAN, OW PW 2002 Yu-Kwong Ricky Kwok, Vincent K.N. Lau: Wireless Internet and mobile computing, Wiley 2007 | |
| | Supplementary literature | Hać A.: Mobile telecommunications protocols for data networks, Wiley 2007 Zheng J., Jamalipour A.:Wireless sensor networks. J. Wiley, 2012 | |
| | eResources addresses | Adresy na platformie eNauczanie: Lokalne sieci bezprzewodowe (2024L) - Moodle ID: 37072 https://enauzanie.pg.edu.pl/moodle/course/view.php?id=37072 | |
| Example issues/ example questions/ tasks being completed | Wireless networks efficiency, standard algorithms for WLAN operation,access point modes of operation, WLAN security | | |
| Work placement | Not applicable | | |