



Subject card

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| Subject name and code | Ethernet and IP Networks, PG_00047859 | | | | | | |
| Field of study | Biomedical Engineering, Biomedical Engineering, Biomedical Engineering | | | | | | |
| Date of commencement of studies | October 2022 | | Academic year of realisation of subject | | 2024/2025 | | |
| 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 | | 3.0 | | |
| 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 Nowicki | | | | |
| | Teachers | | dr inż. Krzysztof Nowicki | | | | |
| 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 | | 3.0 | | 42.0 | 75 |
| Subject objectives | Acquainted with the concept of Ethernet from end to end. Feasibility of the concept now and in the coming years. Acquainted with the problems of scalability, reliability, quality, manageability and offer services in Ethernet networks. Acquainted with modern IP networks solutions, migration from IPv4 to IPv6 and IPv6 protocol capabilities. | | | | | | |
| Learning outcomes | Course outcome | | Subject outcome | | Method of verification | | |
| | [K6_U02] can perform tasks related to the field of study in an innovative way as well as solve complex and nontypical problems, applying knowledge of physics, in changing and not fully predictable conditions | | Student describes the principles of Ethernet network cooperation with other networks Student explains the principles of managing Ethernet and IP networks | | [SU1] Assessment of task fulfilment | | |
| | [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 | | The student knows the structure and operation principles of Ethernet / IP components and systems, including CE and IPv6 | | [SW1] Assessment of factual knowledge | | |
| | [K6_U07] can apply methods of process and function support, specific to the field of study | | Student designs solutions to raise security level of systems based on Ethernet and IP technologies Student employs real-world equipment | | [SU4] Assessment of ability to use methods and tools | | |

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| Subject contents | History of Ethernet and IP networks. Standardization processesDominance of Ethernet solutions on the market of local and city networks. Gigabit solutions (10/40/100/400/800 Gbps) Ethernet End-to-end Ethernet concept. Carrier Ethernet (services, scalability, manageability, QoS, reliability). Ethernet solutions compatibility. PoE device power supply problems. Adapting Ethernet to IP protocols. Supporting multicast broadcasts. Industrial / Automotive Ethernet. Principles of cooperation of Ethernet networks with wireless solutions.An overview of the IPv6 concept. Basics of IPv6 addressing - unicast, multicast, anycast addressing. Address allocation and the problem of routing tables. Static and dynamic configuration of IPv6 and DNS. IPv4 / IPv6 network coexistence. Migration methods. Services on IPv6 networks. VoIP.Security in Ethernet and IP networks. Prospects for the development of Ethernet and IP networks. Cooperation of Ethernet and IP networks. | | |
| Prerequisites and co-requisites | Completed course "Computer Networks" lecture + laboratory | | |
| Assessment methods and criteria | Subject passing criteria | Passing threshold | Percentage of the final grade |
| | Practical exercise | 50.0% | 50.0% |
| | Midterm colloquium | 50.0% | 50.0% |
| Recommended reading | Basic literature | Nowicki K.: Ethernet - sieci, mechanizmy, Infotech 2006 Nowicki K., Światowiak J.: Protokoły IPv6, PG, 2002. . | |
| | Supplementary literature | Nowicki K., Uhl T.: Ethernet End-to-End, Shaker Verlag 2008 Nowicki K., Woźniak J.: Przewodowe i bezprzewodowe sieci LAN, OW PW 2002 An IPv6 Deployment Guide, The 6NET Consortium, September 2005 Krawczyk H., Kaczmarek S., Nowicki K.: Aplikacje i usługi a technologie sieciowe, WN PWN 2018 | |
| | eResources addresses | Adresy na platformie eNauczanie: | |
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| Example issues/ example questions/ tasks being completed | Sniffing in switched environments IPv6 systems configuration | | |
| Work placement | Not applicable | | |

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