



Subject card

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|---|--|--|---|-------------------------------------|--|------------|-----|
| Subject name and code | Telecommunication Systems and Networks II, PG_00047921 | | | | | | |
| Field of study | Electronics and Telecommunications | | | | | | |
| Date of commencement of studies | October 2024 | | Academic year of realisation of subject | | 2025/2026 | | |
| Education level | first-cycle studies | | Subject group | | Obligatory subject group in the field of study 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 | 2 | | Language of instruction | | Polish | | |
| Semester of study | 4 | | ECTS credits | | 2.0 | | |
| Learning profile | general academic profile | | Assessment form | | assessment | | |
| Conducting unit | Department of Teleinformation Networks -> Faculty of Electronics, Telecommunications and Informatics | | | | | | |
| Name and surname of lecturer (lecturers) | Subject supervisor | | dr inż. Marcin Narloch | | | | |
| | Teachers | | dr inż. Marcin Narloch | | | | |
| Lesson types and methods of instruction | Lesson type | Lecture | Tutorial | Laboratory | Project | Seminar | SUM |
| | Number of study hours | 0.0 | 0.0 | 15.0 | 15.0 | 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 | | 2.0 | | 18.0 | 50 |
| Subject objectives | Practical familiarize of student with the functioning of interfaces, protocols and implementation of telecommunication services for digital network with circuit switching and packet switching. Understanding the basic principles of practical network dimensioning for transmission part and switching nodes. | | | | | | |

| Learning outcomes | Course outcome | Subject outcome | Method of verification |
|---------------------------------|--|--|---|
| | [K6_U09] can carry out a critical analysis of the functioning of existing technical solutions and assess these solutions, as well as apply experience related to the maintenance of technical systems, devices and facilities typical for the field of studies, gained in the professional engineering environment | Student is able to make a critical analysis of the functioning of existing technical solutions in telecommunications systems and networks and assess the functionality of these solutions as well as take advantage of experience related to the maintenance of telecommunications equipment and systems | [SU3] Assessment of ability to use knowledge gained from the subject |
| | [K6_U08] while identifying and formulating specifications of engineering tasks related to the field of study and solving these tasks, can:n- apply analytical, simulation and experimental methods,n- notice their systemic and non-technical aspects,n- make a preliminary economic assessment of suggested solutions and engineering work n | Student is able to use analytical and experimental methods, see their system and non-technical aspects, make a preliminary assessment and selection of proposed system solutions | [SU4] Assessment of ability to use methods and tools [SU1] Assessment of task fulfilment |
| | [K6_U07] can apply methods of process and function support, specific to the field of study | Student is able to use methods supporting processes and functions, specific to issues related to telecommunications systems and networks | [SU4] Assessment of ability to use methods and tools |
| | [K6_U31] can identify telecommunications network architectures, differentiates their areas and functional elements, evaluates the quality of service delivery, calculates parameters of functional elements | Student identifies the telecommunications network architecture, distinguishes its areas and functional elements, assesses the quality of services, calculates the parameters of functional elements | [SU2] Assessment of ability to analyse information |
| | [K6_W35] Knows the concepts of the technique of signal transmission, operation of telecommunications networks and multimedia services and the rules for providing them | Student knows the concepts of the functioning of the telecommunications network and telecommunications services, the principles of their implementation, techniques of signal transmission, the concepts of multiplication and synchronization in a transmission network. | [SW1] Assessment of factual knowledge |
| Subject contents | <p>Reach of digital transmission systems for copper pair Transmission distance for optical link and / or the optical path. Capacity dimensioning of the interface between nodes Dimensioning of switching node equipment Dimensioning of unidirectional SDH ring Dimensioning of bidirectional SDH ring The physical layer for the S/T and U point in the BRA-ISDN access. The physical layer for the E1 interface of the PCM30 track. Frame and multiframe structure of the PCM30 system. Service scenario of the connection in the PSTN/ISDN network. Signaling messages for DSS1. Signaling messages for SS7 ISUP. Teleservices and supplementary services in networks with circuit switching. Teleservices and supplementary services in networks with the packets switching. The access to broadband services in ADSL system. The simultaneous access to services of PSTN/ISDN network and IP network.</p> | | |
| Prerequisites and co-requisites | | | |
| Assessment methods and criteria | Subject passing criteria | Passing threshold | Percentage of the final grade |
| | Practical exercise | 50.0% | 50.0% |
| | Project | 50.0% | 50.0% |
| Recommended reading | Basic literature | Material prepared by the lecturer in the form of xeroxcopy. Manual in the form of xeroxcopy. | |
| | Supplementary literature | <p>Horak R.: Telecommunications and data communications handbook John Wiley, 2007</p> <p>Kula S.: Systemy teletransmisyjne, WKL, Warszawa 2004</p> | |
| | eResources addresses | Adresy na platformie eNauczanie: | |

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| Example issues/ example questions/ tasks being completed | The TDM network Interfaces Teleservices and supplementary services in ISDN Telephone services in IP networks Dimensioning of access network PSTN / ISDN Dimensioning of equipment of access node Design of optical SDH rings Reach of optical transmission Designing of WDM optical ring |
| Work placement | Not applicable |