



Subject card

| | | | | | | | |
|---------------------------------------------|------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|-------------------------------------|------------|----------------------------------------------------------------------------------------------|---------|-----|
| Subject name and code | Information Streams Control, PG_00048356 | | | | | | |
| Field of study | Electronics and Telecommunications, Biomedical Engineering, Biomedical Engineering, Biomedical Engineering | | | | | | |
| Date of commencement of studies | February 2022 | Academic year of realisation of subject | | | 2022/2023 | | |
| Education level | second-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 | 1 | Language of instruction | | | Polish | | |
| Semester of study | 2 | 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 | 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 | 4.0 | | 16.0 | 50 | |
| Subject objectives | Accuiring knowledge of information stream control in telecommunication networks | | | | | | |

| | | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|
| Learning outcomes | Course outcome | Subject outcome | Method of verification |
| | [K7_U06] can analyse the operation of components, circuits and systems related to the field of study; measure their parameters; examine technical specifications; interpret obtained results and draw conclusions | Student practically configures and evaluate information streams control in different network technologies. | [SU1] Assessment of task fulfilment |
| | [K7_U03] can design, according to required specifications, and make a complex device, facility, system or carry out a process, specific to the field of study, using suitable methods, techniques, tools and materials, following engineering standards and norms, applying technologies specific to the field of study and experience gained in the professional engineering environment | Student practically configures and evaluate information streams control in different network technologies. | [SU1] Assessment of task fulfilment |
| | [K7_W05] Knows and understands, to an increased extent, methods of process and function support, specific to the field of study. | Student describes issues of call, connection, congestion and traffic control in networks. Student identifies problems of static, hierarchic and dynamic routing for STM and routing (including QoS routing) for ATM and IP networks. | [SW1] Assessment of factual knowledge |
| | [K7_W03] Knows and understands, to an increased 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. | Student describes issues of call, connection, congestion and traffic control in networks. Student identifies problems of static, hierarchic and dynamic routing for STM and routing (including QoS routing) for ATM and IP networks. | [SW1] Assessment of factual knowledge |
| [K7_W06] Knows and understands, to an increased extent, the basic processes taking place in the life cycle of devices, facilities and technical systems. | Student describes issues of call, connection, congestion and traffic control in networks. Student identifies problems of static, hierarchic and dynamic routing for STM and routing (including QoS routing) for ATM and IP networks. | [SW1] Assessment of factual knowledge | |
| Subject contents | 1. Control of call, connection, congestion and traffic 2. Relation among signalization, routing protocols and algorithms 3. Evolution of path selection methods (routing) algorithms 4. Routing with alternative paths: hierarchical and dynamic routing 5. Path selection methods in dynamic routing 6. Notion of cost in STM network routing 7. Application of Markov decision process in path selection methods 8. Learning automata in routing algorithms 9. Examples of routing algorithms implementation in STM networks 10. Routing in ATM networks and characteristics of PNNI 11. Multilevel hierarchy of PNNI topology 12. Routing metrics and algorithms in traditional IP networks 13. IGP and EGP protocols in IP networks 14. Routing in IP networks regarding quality of service - QoS routing 15. Metrics in IP QoS routing 16. QOSPF protocol 17. Constraint Based Routing as a generalization of QoS routing 18. Control and label distribution protocols in MPLS networks 19. Application of MPLS in network resource management and traffic control 20. Stream control in optical network – GMPLS/ASON 21. Concept of Softswitch as an element of call and connection control in IP QoS network | | |
| Prerequisites and co-requisites | No requirements | | |
| Assessment methods and criteria | Subject passing criteria | Passing threshold | Percentage of the final grade |
| | Reports from laboratory excercises | 50.0% | 50.0% |
| | Midterm colloquium | 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 | 1. Ash G. R., Traffic Engineering and QoS Optimization of Integrated Voice and Data Networks, Morgan Kaufmann, 2007. 2. Chao H. J., Gou X., Quality of Service Control in High-Speed Networks, John Wiley & Sons, 2002. 3. Farrel A., Internet and its protocols. A comparative approach. Morgan Kaufmann, 2006. 4. Guichard J., Le Faucheur F., Vasseur J.-P., Definitive MPLS Network Designs, Cisco Press, 2005. 5. Halabi S., McPherson D., Internet Routing Architectures (2nd ed.), Cisco Press, 2000. 6. Perros H., Connection-oriented Networks SONET/SDH,ATM,MPLS and OPTICAL NETWORKS, John Wiley & Sons, 2005. 7. Pióro M., Medhi D., Routing, Flow, and Capacity Design in Communication and Computer Networks, Morgan Kaufmann, 2004. 8. White R., Retana A., IS-IS: Deployment in IP Networks, Addison Wesley, 2002 | |
| | eResources addresses | | |

| | |
|----------------------------------------------------------------|----------------|
| Example issues/ example questions/ tasks being completed | |
| Work placement | Not applicable |