# Card of Course

| Description of course | |
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| Code of course | - |
| Name of course | Basics of Telecommunication |
| Version of course | 2024/2025 |
| **A. Place of the course in system of studies** | |
| Level of education | Pre - Intermediate |
| Form and mode of studies | Full-time studies |
| Field of studies | Transport |
| Profile of studies | General academic profile |
| Specialisation | Main field |
| Place of teaching of course | Faculty of Transport |
| Place of realization of course | Department of Telecommunication in Transport |
| Coordinator of course | PhD. Eng. Karolina Krzykowska-Piotrowska |
| **B. General characteristic of the course** | |
| Block of courses | Main field |
| Group of courses | General |
| Level of course | Pre - Intermediate |
| Status of course | Faculty with limited choice |
| Language of course | English |
| Nominal semester | |
| Academic year | 2024/2025 |
| Preliminary requirements | Basic knowledge of information and communication technologies and transport system engineering. |
| Limit of students | 24 |
| **C. Effects of education and manner of teaching** | |
| Purpose of course | This course will cover fundamentals of digital communications and networking. We will study the basics of information theory, sampling and quantization, coding, modulation, signal detection and system performance in the presence of noise. The concepts taught in class will be discussed in the context of aerospace communication systems: aircraft communications, satellite communications, and deep space communications. |
| Effects of education | See Table 1. |
| Form of didactic studies and number of hours per week | |
| Lecture | - |
| Exercise type of course | - |
| Laboratory | - |
| Project type of course | 1 |
| Contents of education | This course focuses on the modern systems in telecommunication, time - frequency representation of telecommunication signals as continuous signals and digital signals. It consist also subjects such as: channel coding, block codes and convolutional codes. Selected topics of information theory: bit rate, the entropy of information, Shannon's theorem, the error rate are mentioned during the course. Classification modulation and Code modulation - PCM Pulse modulation are practiced too. Understanding the basic concepts of identifying sources, processing, transmission in telecommunication systems. |

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| | Understanding the chosen alternative for the processing and transmission of information. |
| Methods of evaluation | Presentation, discussion, practical classes (laboratories) |
| Methods of verification of effects of education | See Table 1. |
| Exam | No |
| Literature | [1] Telecommuniactions basics, www.wndw.net, pdf.<br>[2] M.K. Khan, Telecommunication Systems. Modelling, Analysis, Design and Management. ISSN: 1018 – 4864.<br>[3] E. Bohlin, Telecommunications Policy. Elsevier 2014.<br>[4] J. G. Proakis, Fundamentals of Telecommunications, Roger L. Freeman. Published by John Wiley & Sons, Inc. 1999.<br>[5] U.S. Department of Transportation Federal Highway Administration, Telecommunications Handbook for Transportation Professionals. The Basics of Telecommunications Final Report September, 2004.<br>[6] J. N. Pelton, S. Madry, S. Camacho-Lara, Handbook of satellite applications, Springer, 2012. |
| Website of the course | http://www.wt.pw.edu.pl/Studenci/International-Office-Erasmus-Programme/Incoming-students |
| **D. Student's activity** | |
| Number of credits ECTS | 5 |
| Number of hours of student's job for achievement of education's effect (description): | 20 hours – project<br>5 hours - academic teacher consulting<br>30 hours – students work |
| Number of credits ECTS on the course with direct participation of academic teacher | 2 |
| Number of credits ECTS on practical activities on the course | 3 |
| **E. Additional information** | |
| Notes | |
| Date of last edition | 2024/11/20 |

## Table 1. General academic profile

| Course's effects | | Field effects | Area effect |
|---|---|---|---|
| **Knowledge** | | | |
| Effect: | Has knowledge of mathematics, physics, and other areas concerning of major, useful for wording and resolving simple problems of major range. | Tr1A_W01 | T1A_W01, T!A_W07 |
| Code of effect: | W_01 | | |
| Verification: | Resolving mathematical tasks on the subject, discussion. | | |

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| Effect: | Has basic knowledge about recent and relevant requirements relating to designing simple transport telematics services. | Tr1A_W02 | T1A_W01 |
| Code of effect: | W_02 | | |
| Verification: | Resolving mathematical tasks on the subject, discussion. | | |
| **Skills** | | | |
| Effect: | Has the ability to demonstrate the process of transport telematics project management. | Tr1A_U01 | T1A_U01 |
| Code of effect: | U_01 | | |
| Verification: | Mathematical tasks, discussion. | | |
| Effect: | Acquire knowledge to show the possible application of learned elements. | Tr1A_U03 | T1A_U02<br>T1A_U03<br>T1A_U04 |
| Code of effect: | U_03 | | |
| Verification: | Presentation. | | |
| **Social competences** | | | |
| Effect: | Are conscious of significant impact of telecommunication in transport telematics. Is aware of advantages and risks of using modern technologies in transport. | Tr1A_K06 | T1A_K07 |
| Code of effect: | Tr1A_K06 | | |
| Verification: | Discussion. | | |