# GDAŃSK UNIVERSITY OF TECHNOLOGY

## Subject card

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| Subject name and code | Safety and Reliability, PG_00048041 |
| Field of study | Informatics, Biomedical Engineering, Biomedical Engineering, Biomedical Engineering |

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| Date of commencement of studies | February 2023 | Academic year of realisation of subject | 2023/2024 |
| Education level | second-cycle studies | Subject group | Optional subject group<br>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 | 3.0 |
| Learning profile | general academic profile | Assessment form | assessment |

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| Conducting unit | Department of Computer Communications -> Faculty of Electronics, Telecommunications and Informatics |
| Name and surname of lecturer (lecturers) | Subject supervisor: dr inż. Krzysztof Gierłowski<br><br>Teachers: dr inż. Krzysztof Gierłowski<br><br>dr hab. inż. Jacek Rak<br><br>dr inż. Michał Hoeft |

| Lesson types and methods of instruction | Lesson type | Lecture | Tutorial | Laboratory | Project | Seminar | SUM |
|---|---|---|---|---|---|---|---|
| | Number of study hours | 15.0 | 0.0 | 15.0 | 15.0 | 0.0 | 45 |
| | 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 |
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| | Number of study hours | 45 | 6.0 | 24.0 | 75 |

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| Subject objectives | Lectures are designed to familiarize students with a process od designing, deploying and accessing cloud-based systems, with special attention devoted to aspects of their security and reliability. Practical project allows students to employ the theoretical knowledge in practice, by designing and deploying a functional element of a private cloud system. Laboratory exercises enables students to deploy and test such a cloud system element in a fully-controlled laboratory environment. |

| Learning outcomes | Course outcome | Subject outcome | Method of verification |
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| | [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 knows basic building blocks of cloud-based systems and their interactions. Additionally students knows general design steps related to such systems and most common risks to their security and reliability. | [SW1] Assessment of factual knowledge |
| | [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 | Students can design a basic, but functional private-cloud system, taking into account its security and reliability aspects. | [SU3] Assessment of ability to use knowledge gained from the subject |
| | [K7_U05] can plan and conduct experiments related to the field of study, including computer simulations and measurements; interpret obtained results and draw conclusions | Student can design and conduct a testing process of a simple private-cloud system, deployed in a fully controlled laboratory environment. | [SU4] Assessment of ability to use methods and tools |
| | [K7_K02] is ready to provide critical evaluation of received content and to acknowledge the importance of knowledge in solving cognitive and practical problems | Student can interpret results of laboratory testing of a simple, private-cloud system and suggests design modifications as needed. | [SK5] Assessment of ability to solve problems that arise in practice |

| Subject contents | |
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| | 1. Introduction to cloud systems. |
| | 2. Security aspects of datacenter installations.. |
| | 3. Types of cloud systems and their security specifics: public and private clouds. |
| | 4. Popular cloud system building blocks and relevant security mechanisms: storage, host virtualization, network connectivity, management, AAA. |
| | 5. Security aspects of cloud application design. |
| | 6. Trusted OS booting. |
| | 7. Application security in OS and network environments. |
| | 8. Security of remote access and management. |
| | 9. Resilience measures in networked systems. |
| | 10. Reliability mechanisms of networked systems. |

| Prerequisites and co-requisites | |
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| | Theoretical knowledge and practical skills related to IP network configuration and management, as well as configuration and management of popular services deployed in their environment. |

| Assessment methods and criteria | Subject passing criteria | Passing threshold | Percentage of the final grade |
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| | Written test | 50.0% | 40.0% |
| | Practical project | 50.0% | 30.0% |
| | Laboratory experiments | 50.0% | 30.0% |

| Recommended reading | Basic literature | • Lecture materials. |
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| | | • White papers and documentation of relevent private-cloud solutions and products. |
| | Supplementary literature | • Zaigham Mahmood, Thomas Erl, Ricardo Puttini, Cloud Computing: Concepts, Technology & Architecture, 2013 |
| | eResources addresses | Adresy na platformie eNauczanie: Bezpieczeństwo i niezawodność systemów chmurowych (2023Z) - Moodle ID: 34783 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=34783 |

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