



## Subject card

|                                             |                                                                                                                                                                                                                                                                                                                                                                                                         |                                                          |                                                                                                                   |                                     |                                                                     |            |     |
|---------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|-------------------------------------|---------------------------------------------------------------------|------------|-----|
| Subject name and code                       | Information Security Management, PG_00016968                                                                                                                                                                                                                                                                                                                                                            |                                                          |                                                                                                                   |                                     |                                                                     |            |     |
| Field of study                              | ZARZĄDZANIE BEZPIECZEŃSTWEM INFORMACJI                                                                                                                                                                                                                                                                                                                                                                  |                                                          |                                                                                                                   |                                     |                                                                     |            |     |
| Date of commencement of studies             | February 2025                                                                                                                                                                                                                                                                                                                                                                                           |                                                          | Academic year of realisation of subject                                                                           |                                     | 2025/2026                                                           |            |     |
| Education level                             | second-cycle studies                                                                                                                                                                                                                                                                                                                                                                                    |                                                          | Subject group                                                                                                     |                                     |                                                                     |            |     |
| 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 Control Engineering -> Faculty of Electrical and Control Engineering -> Faculties of Gdańsk University of Technology                                                                                                                                                                                                                                                                      |                                                          |                                                                                                                   |                                     |                                                                     |            |     |
| Name and surname of lecturer (lecturers)    | Subject supervisor                                                                                                                                                                                                                                                                                                                                                                                      |                                                          | dr inż. Paweł Kowalski                                                                                            |                                     |                                                                     |            |     |
|                                             | Teachers                                                                                                                                                                                                                                                                                                                                                                                                |                                                          |                                                                                                                   |                                     |                                                                     |            |     |
| Lesson types                                | Lesson type                                                                                                                                                                                                                                                                                                                                                                                             | Lecture                                                  | Tutorial                                                                                                          | Laboratory                          | Project                                                             | Seminar    | SUM |
|                                             | Number of study hours                                                                                                                                                                                                                                                                                                                                                                                   | 15.0                                                     | 0.0                                                                                                               | 0.0                                 | 0.0                                                                 | 15.0       | 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                          | The aim of the course is to equip students with the knowledge and skills necessary to identify threats in information systems, protect data, and apply modern cryptographic methods and security mechanisms. Students gain competencies in analyzing information leak cases, assessing risks, and designing and implementing defense strategies against threats in industrial and network environments. |                                                          |                                                                                                                   |                                     |                                                                     |            |     |
| Learning outcomes                           | Course outcome                                                                                                                                                                                                                                                                                                                                                                                          |                                                          | Subject outcome                                                                                                   |                                     | Method of verification                                              |            |     |
|                                             | [K7_U08] has the necessary preparation to work in an industrial environment, carry out research, apply principles of health and safety at work                                                                                                                                                                                                                                                          |                                                          | Applies information security management and data protection principles in industrial environments and IT systems. |                                     | [SU5] Ocena umiejętności zaprezentowania wyników realizacji zadania |            |     |
|                                             | [K7_K05] can think and act in an entrepreneurial way                                                                                                                                                                                                                                                                                                                                                    |                                                          | Works in a team and thinks and acts entrepreneurially.                                                            |                                     | [SK1] Ocena umiejętności pracy w grupie                             |            |     |
|                                             | [K7_W09] has knowledge of typical security systems in industrial settings, knows methods of identification and design of protection systems in accordance with the methodology of functional security, has knowledge of information security                                                                                                                                                            |                                                          | Applies hazard identification methods in industrial systems."                                                     |                                     | [SW3] Ocena wiedzy zawartej w opracowaniu tekstowym i projektowym   |            |     |

|                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                               |
|----------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| Subject contents                                               | Course content – lecture<br>Basic aspects of information security: identification, authenticity and authorization, confidentiality, integrity and accessibility. Hazards: users, attacks, malicious software, informatics wars. Types and methods of safety violation of computer systems. Methods and measures of information security. Methods and systems of the access control. Fire walls. Systems of intruders finding. Spam phenomenon and countermeasures. Virtual private networks: architectures and protocols. Cryptographic methods and algorithms. Basic principles of information security management.                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                               |
|                                                                | Identification of hazards, and analysis and assessment of risks. Basic strategies of information security management. A system of information security in company and institution. Requirements concerning the information security and protections with regard to standards: PN-ISO/ISO 17799, ISO/IEC TR 13335 and PN-ISO/IEC 27001. Standard ISO/IEC 15408 and meaning of common criteria (CC). Life cycle and information security management. Basics of the protection system design with regard to technical and organizational aspects. Examples of solutions. The role of the board of directors. Audit of the information security management system. Methods and tools for the safety and security assessment. The quality and reliability management of software. |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                               |
|                                                                | Safety and security of wired and wireless networks. Safety of some protocols, hazards and countermeasures. Data coding mechanisms and authenticity. Electronic signature. Standards used in wireless networks and security mechanisms. Integrated functional safety and information security management in programmable industrial control and protection systems. Safety and security of distributed industrial computer networks with ragard to the standard IEC 62443.                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                               |
|                                                                | Course content – seminar<br>Introduction to information security management and security standards (e.g., ISO/IEC 27001). Authentication, authorization, and access control mechanisms.<br>Analysis of information leak cases and their causes.<br>Methods of attacking and defending against data leaks.<br>Assessment of vulnerabilities in systems and web services from an information security perspective.                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                               |
| Prerequisites and co-requisites                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                               |
| Assessment methods and criteria                                | Subject passing criteria                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Passing threshold                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Percentage of the final grade |
|                                                                | lecture                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 50.0%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 20.0%                         |
|                                                                | seminar                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 50.0%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 80.0%                         |
| Recommended reading                                            | Basic literature                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 1. Anderson R.: Inżynieria zabezpieczeń. Wydawnictwo Naukowo Techniczne, Warszawa: 2005.<br>2. Białas A.: Bezpieczeństwo informacji i usług w nowoczesnej instytucji i firmie. Wydawnictwa Naukowo-Techniczne, Warszawa 2006.<br>3. Karpiński M. (red.): Bezpieczeństwo informacji. Wydawnictwo PAK, Warszawa 2012.<br>4. Liderman K.: Analiza ryzyka i ochrona informacji w systemach komputerowych. Wydawnictwo Naukowe PWN, Warszawa 2008.<br>5. Liderman K.: Bezpieczeństwo informacyjne. Wydawnictwo Naukowe PWN, Warszawa 2012.<br>6. Schneier B.: Kryptografia dla praktyków. Wiley, PWN, 2002.<br>7. Wesołowski J., Namieśnik J.: Bezpieczeństwo i ochrona informacji. Politechnika Gdańska, Wydział Chemiczny, Gdańsk 2007. |                               |
|                                                                | Supplementary literature                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 1. Dostalek L.: Bezpieczeństwo protokołu TCP/IP. Wydawnictwo Naukowe PWN, Warszawa, 2003.<br>2. Kosmowski K.T.: Functional safety management in critical systems, Gdańsk, 2008.<br>3. Sankar K. i inni: CISCO. Bezpieczeństwo sieci bezprzewodowych. Wyd. Mikom, Warszawa, 2005.<br>4. PN-ISO/IEC 27001: Technika informatyczna - Techniki bezpieczeństwa. Systemy zarządzania bezpieczeństwem informacji. Wymagania .                                                                                                                                                                                                                                                                                                               |                               |
|                                                                | eResources addresses                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                               |
| Example issues/<br>example questions/<br>tasks being completed | Threats related to information protection.<br>Functional safety and information security management system in an enterprise.<br>Legal and standardization aspects of information protection management.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                               |
| Practical activites within the subject                         | Not applicable                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                               |

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