

## Subject card

|                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                          |                                         |                                     |                                                                                                                                                |            |     |
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| Subject name and code                       | Computer Network Administration, PG_00178487                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                          |                                         |                                     |                                                                                                                                                |            |     |
| Field of study                              | Informatics and Econometrics                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                          |                                         |                                     |                                                                                                                                                |            |     |
| Date of commencement of studies             | October 2026                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                          | Academic year of realisation of subject |                                     | 2027/2028                                                                                                                                      |            |     |
| Education level                             | Bachelor's studies                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                          | Subject group                           |                                     | Obligatory subject group in the field of study<br>Optional subject group<br>Subject group related to scientific research in the field of study |            |     |
| Mode of study                               | part-time studies                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                          | Mode of delivery                        |                                     | at the university                                                                                                                              |            |     |
| Year of study                               | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                          | Language of instruction                 |                                     | Polish                                                                                                                                         |            |     |
| Semester of study                           | 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                          | ECTS credits                            |                                     | 7.0                                                                                                                                            |            |     |
| Learning profile                            | academic                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                          | Assessment form                         |                                     | exam                                                                                                                                           |            |     |
| Conducting unit                             | Department of Business Informatics -> Faculty of Management -> Rector                                                                                                                                                                                                                                                                                                                                                                                                         |                                                          |                                         |                                     |                                                                                                                                                |            |     |
| Name and surname of lecturer (lecturers)    | Subject supervisor                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                          | dr hab. Bartosz Marcinkowski, prof. UG  |                                     |                                                                                                                                                |            |     |
|                                             | Teachers                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                          |                                         |                                     |                                                                                                                                                |            |     |
| Lesson types                                | Lesson type                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Lecture                                                  | Tutorial                                | Laboratory                          | Project                                                                                                                                        | Seminar    | SUM |
|                                             | Number of study hours                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 8.0                                                      | 0.0                                     | 32.0                                | 0.0                                                                                                                                            | 0.0        | 40  |
|                                             | 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                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 40                                                       |                                         | 2.0                                 |                                                                                                                                                | 133.0      | 175 |
| Subject objectives                          | <ul style="list-style-type: none"><li>• preparing students to build topologies as well as configure and diagnose networks based on Cisco routers and switches</li><li>• developing skills of selecting routing strategies, solving intermediate-level routing configuration problems, managing switches at the VLAN level, and implementing DHCP, ACL, and NAT/PAT services</li><li>• making students ready for the Cisco Certified Network Associate certification</li></ul> |                                                          |                                         |                                     |                                                                                                                                                |            |     |

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| Learning outcomes               | Course outcome                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Subject outcome                                                                                                                                                                                                                                                                                                                                                                                                                            | Method of verification                 |
|                                 | [IiEL3_W08] Has advanced knowledge and understanding of the possibilities and dilemmas of using informatics and statistics tools and their importance in the context of changing needs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | (1) knows and understands the specifics and role of individual network devices and transmission media in network architecture;<br>(2) knows and understands network addressing schemes and the criteria for their selection;<br>(3) knows and understands the operational principles of selected network protocols/services and the datagrams they utilize;<br>(4) knows and understands how network security components function.         | [SW4] test/exam - oral or written      |
|                                 | [IiEL3_U12] Can design and implement IT systems to enhance business operations and effectively utilize modern ICT technologies for management and business communication                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | (1) is able to creatively adapt network infrastructure to the needs of a business organization;<br>(2) is able to construct physical connections between network and end devices;<br>(3) is able to evaluate network performance and plan its development.                                                                                                                                                                                 | [SU5] implementation of a problem task |
|                                 | [IiEL3_U02] Can select or construct econometrics, informatics or statistics tools and apply them to describe and solve economic and social problems                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | (1) is able to perform basic configuration of switches and routers;<br>(2) is able to propose an optimal routing method and configure the associated routing protocols;<br>(3) is able to implement network security elements regarding password policies, logical network separation, port security, and Access Control Lists (ACLs);<br>(4) is able to extend end-device addressing mechanics by implementing DHCP and NAT/PAT services. | [SU5] implementation of a problem task |
| Subject contents                | <p>A. Topics of the lecture:</p> <ul style="list-style-type: none"> <li>Basic networking concepts</li> <li>Layered network models</li> <li>MAC, IPv4 and IPv6 addressing</li> <li>Networking media</li> <li>Networking devices</li> <li>Static and dynamic routing</li> <li>Specialised network technologies and protocols across switches and routers</li> </ul> <p>B. Lab topics:</p> <ul style="list-style-type: none"> <li>Basic commands on hosts</li> <li>Handling network addresses</li> <li>Introduction to IOS</li> <li>Building networking topologies</li> <li>Password policy</li> <li>Static routing</li> <li>Introduction to routing protocols</li> <li>DHCP service</li> <li>Port security</li> <li>VLANs</li> <li>Advanced routing protocols - EIGRP, OSPF</li> <li>Configuring NAT/PAT service on networking devices</li> <li>Access Control Lists</li> <li>ROM-monitor mode</li> </ul> |                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                        |
| Prerequisites and co-requisites | Bit-based operations, software classes, command line operation, general features of operating systems and input/output processes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                        |
| Assessment methods and criteria | Subject passing criteria                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Passing threshold                                                                                                                                                                                                                                                                                                                                                                                                                          | Percentage of the final grade          |
|                                 | written exam                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 51.0%                                                                                                                                                                                                                                                                                                                                                                                                                                      | 30.0%                                  |
|                                 | certification assessment - incremental grading                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 51.0%                                                                                                                                                                                                                                                                                                                                                                                                                                      | 20.0%                                  |
|                                 | practical assessment                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 51.0%                                                                                                                                                                                                                                                                                                                                                                                                                                      | 50.0%                                  |
| Recommended reading             | Basic literature                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <ul style="list-style-type: none"> <li>Cisco Networking Academy (2025); CCNA: Introduction to Networks</li> <li>Cisco Networking Academy (2025); CCNA: Switching, Routing, and Wireless Essentials</li> <li>Cisco Networking Academy (2025); CCNA: Enterprise Networking, Security, and Automation</li> </ul>                                                                                                                              |                                        |

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|                                                                | Supplementary literature | • Empson S. (2019); CCNA 200-301 Portable Command Guide. Fifth Edition; Cisco Press |
|                                                                | eResources addresses     |                                                                                     |
| Example issues/<br>example questions/<br>tasks being completed |                          |                                                                                     |
| Work placement                                                 | Not applicable           |                                                                                     |

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