

COMPUTER SCIENCE LEARNING OUTCOMES

Name of the field of study: **COMPUTER SCIENCE**

Degree obtained by the graduate: Bachelor of Engineering

Level of education: **first-cycle studies**

Number of semesters: **7**

Educational profile: **practical**

Number of ECTS: **210**

Mode of study: **full-time and part-time studies**

Domain: Engineering and technical sciences

Leading discipline: Information technology and telecommunications

Field-related learning outcomes	Reference to universal PQF characteristics ¹	Reference to the characteristics of the second degree of the PQF for the appropriate level ²	Characteristics for qualifications at PQF level 6, enabling the achievement of engineering competences
KNOWLEDGE: THE GRADUATE			
INF³_W⁴01	has the advanced knowledge and understanding of the terminology applicable to the scientific discipline: Information technology and telecommunications, a place of subdiscipline computer science in engineering and technical sciences, relationships with subdisciplines in engineering and technical sciences and disciplines such as mathematics and physical sciences	P6U_W	P6S_WG P6S_WG_INŻ

¹PQF level 6-9 according to the annex to the Act of 22 December 2015 on the Integrated Qualification System, *Polish Qualifications Framework*, Institute for Educational Research, Warsaw 2016.

²Reference to the characteristics of the second degree of learning outcomes for qualifications at levels 6-8 of the Polish Qualifications Framework typical of qualifications obtained within the system of higher education and science after obtaining a full qualification at level 4, *Polish Qualifications Framework*, Institute for Educational Research, Warsaw 2016.

³ Field-related learning outcomes for the field of study of computer science

⁴ Category of knowledge

INF_W02	has the advanced knowledge and understanding of issues such as operation of analogue and digital electronic circuits – including systems containing programmable circuits, computer system architecture, programming methods, programming methods, algorithms, operating systems, network and Internet technologies, computer graphics, databases, software engineering and security of computer systems and their reference to IT professional activities	P6U_W	P6S_WG	P6S_WG_INŽ
INF_W03	knows and understands the issues of industrial networks and controllers, control and visualisation systems, and knows their practical applications	P6U_W	P6S_WK	P6S_WK_INŽ
INF_W04	has the advanced knowledge and understanding of issues related to the use of graphics and computer techniques for visualisation purposes	P6U_W	P6S_WG	P6S_WG_INŽ
INF_W05	has the advanced knowledge of methods, techniques, tools and materials used to solve simple engineering tasks and technical standards related to the professional activity relevant to the field of computer science	P6U_W	P6S_WG	P6S_WG_INŽ
INF_W06	has knowledge necessary to understand the social, economic, legal and other non-technical conditions of engineering activity, knows and understands the basic concepts and principles of protection of industrial property and copyright, and knows the general principles of creating and developing forms of individual entrepreneurship in the IT market	P6U_W	P6S_WK	P6S_WK_INŽ
SKILLS: THE GRADUATE CAN				
INF_U⁵01	properly select sources and information from them, obtain information from databases and other sources, also in English; he or she can integrate the information obtained, evaluate it critically, analyse and interpret it,	P6U_U	P6S_UW	—

⁵ Category of skills

	draw conclusions and formulate and justify opinions using appropriate methods and tools, including advanced information and communication techniques			
INF_U02	work individually and in a team in this interdisciplinary field, performing both tasks related to the achievement and setting of the objectives, as well as the organisation of team's work; can estimate the time needed to perform the task; can develop and implement a timetable to ensure that deadlines are met	P6U_U	P6S_UO	—
INF_U03	prepare in Polish and foreign language documentation on the performance of the engineering task in accordance with applicable standards; he or she prepare and deliver oral presentation in Polish and foreign languages on specific issues in the field of computer science, take part in the debate by presenting various opinions and stances	P6U_U	P6S_UK	—
INF_U04	develop self-education skills, with an emphasis on continuous improvement of professional competences and certification of skills, perfect skills by setting the directions of their own development	P6U_U	P6S_UU	—
INF_U05	use a foreign technical language, with a particular focus on computer science, in accordance with the requirements for level B2 of the Common European Framework of Reference for Languages	P6U_U	P6S_UK	—
BASIC ENGINEERING SKILLS				
INF_U06	the student can plan and conduct experiments, including measurements and computer simulations, interpret the results obtained and draw conclusions when identifying, formulating and solving engineering specifications; recognise their systemic and non-technical aspects, including ethical aspects; critically analyse and evaluate the functioning of existing	P6U_U	P6S_UW	P6S_UW_INŻ

	technical solutions; design, in accordance with the specified specification, and make simple devices, objects, systems typical of the course of study or conduct processes, using appropriate methods, techniques, tools and materials; use the experience gained in the professional engineering environment in the maintenance of equipment, facilities and systems typical of the field of study – in the case of studies with a practical profile			
INF_U07	the student can use properly selected programming environments in the process of designing and verifying the operation of computer applications.	P6U_U	P6S_UW	P6S_UW_INŽ
INF_U08	the student can use analytical, simulation, experimental, system and non-technical aspects to formulate and solve engineering tasks	P6U_U	P6S_UW	P6S_UW_INŽ
INF_U09	the student can solve practical engineering tasks related to the maintenance of equipment, facilities and information systems requiring the use of engineering standards in an industrial environment including labour safety standards using the experience of IT engineers	P6U_U	P6S_UW	P6S_UW_INŽ
INF_U10	the student can conduct an initial economic analysis of activities related to the IT project, implementation and administration of the computer system	P6U_U	P6S_UW	P6S_UW_INŽ
INF_U11	the student can analyse the way of functioning and evaluate the IT systems, their structure and organisation, and manage simple computer systems. He or she can critically analyse the functioning of existing technical solutions and assess these solutions when identifying, formulating and solving engineering tasks specifications	P6U_U	P6S_UW	P6S_UW_INŽ
INF_U12	the student can conduct a critical analysis of the way software works (including multi-component software and processes, also distributed ones), and can identify and formulate the specification of simple computer programming tasks	P6U_U	P6S_UW	P6S_UW_INŽ
INF_U13	the student can design simple computer networks and can formulate specification of tasks related to	P6U_U	P6S_UW	P6S_UW_INŽ

	administration and configuration of computer networks using engineering standards			
INF_U14	the student can identify and formulate the specification of simple practical engineering tasks, characteristic of the field of computer science, using engineering standards	P6U_U	P6S_UW	P6S_UW_INŽ
INF_U15	the student can assess the usefulness of routine methods and tools for the implementation and administration of the database system, as well as select and apply the right method and tools	P6U_U	P6S_UW	P6S_UW_INŽ
INF_U16	the student can design and make the graphic creation according to the specification using appropriate methods, techniques and tools in the field of computer graphics	P6U_U	P6S_UW	P6S_UW_INŽ
INF_U17	the student can propose modifications and improvements of existing design solutions and component models, computer solutions and systems using engineering standards in the field of computer science	P6U_U	P6S_UW	P6S_UW_INŽ
INF_U18	the student can critically analyse symmetric and asymmetric encryption algorithms and select appropriate methods to ensure a defined, required level of security, and system performance applying engineering standards in the field of computer science	P6U_U	P6S_UW	P6S_UW_INŽ
SOCIAL COMPETENCES: THE GRADUATE IS READY TO				
INF_K⁶01	critically assess his or her knowledge and content on the achievements of computer science, recognise the importance of knowledge in solving cognitive and practical problems, and consult experts in the event of difficulties in solving the problem on his or her own	P6U_K	P6S_KK	—
INF_K02	resolve the dilemmas associated with the pursuit of the profession of an IT specialist by observing the	P6U_K	P6S_KR	—

⁶ Category of social competences.

	principles of professional ethics and requires it from others while caring for the traditions and development of the profession			
INF_K03	think in an entrepreneurial way, is open to setting up and running their own business, is ready to take professional challenges	P6U_K	P6S_KO	—
INF_K04	provide information and opinions to the public on the achievements of computer science and other aspects of the engineering activity; he or she is ready to co-organise IT projects for the local environment and to initiate activities related to the development of digitalisation for the public interest	P6U_K	P6S_KO	—