



Subject card

Subject name and code	Information Technologies, PG_00003105						
Field of study	Electrical Engineering						
Date of commencement of studies	October 2022		Academic year of realisation of subject		2022/2023		
Education level	first-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	1		ECTS credits		2.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Katedra Inteligentnych Systemów Sterowania i Wspomagania Decyzji -> Faculty of Electrical and Control Engineering						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Tomasz Zubowicz				
	Teachers		dr inż. Tomasz Zubowicz dr inż. Bartosz Puchalski dr inż. Tomasz Rutkowski				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	0.0	0.0	0.0	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 course is to provide participants with an opportunity to learn the fundamental aspects of using computers for storage, transmission and processing of data and information in engineering applications. Provided illustrations reflect up-to-date scientific and technical challenges.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	K6_K01	1. Student is able to identify and use application or scientific research papers in the field of the subject also affecting the area of knowledge related to the field of study. 2. Student is able to use external resources to gain knowledge or skills in the field of Information Technologies	[SK3] Assessment of ability to organize work [SK4] Assessment of communication skills, including language correctness [SK5] Assessment of ability to solve problems that arise in practice [SK1] Assessment of group work skills
	K6_U03	1. Student is able to select a paper of applied or scientific research character in the field of interest. 2. Student is able to read with (general) understanding a paper of an applied or scientific research character in the field of interest. 3. Student is able to prepare a summary of an application or scientific research paper in the field of interest in a synthetic way. 4. Student is able to prepare and give a short presentation concerning an application or scientific research problem in the field of interest.	[SU2] Assessment of ability to analyse information [SU4] Assessment of ability to use methods and tools [SU5] Assessment of ability to present the results of task
	K6_W07	1. Student knows computer architecture and its components. 2. Student knows the structure, role and elementary functions of operating systems. 3. Student knows basic concepts related to data storage. 4. Student is able to construct a simple database query using SQL. 5. Student understands basic concepts related to communication. 6. Student comprehends the fundamental problems and techniques of wired and wireless communication. 7. Student has a basic knowledge of computer networks, including OSI/ISO and TCP/IP models. 8. Student is able to write a simple computer program using C or Python language. 9. Student has elementary knowledge of programming paradigms. 10. Student is able to estimate the computation complexity of a simple algorithm. 11. Student is able to read simple database and class diagrams. 12. Student has knowledge of basic concepts in software development. 13. Student has knowledge about software version control tools and their role in software development. 14. Student knows the importance of automated methods of code testing. 15. Student has the ability to use a simple cypher to encode and decode a message composed of a character string.	[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects

Subject contents	The Information Technology (TI) course consists of thematic modules that consider problems related to the storage, transmission and processing of data or information. The course introduction covers the topics of the construction and operation of a computer. The 'information and data-storage' module covers topics such as, e.g., information and data representation; databases (with emphasis on their relational form); Big Data problem and data warehousing. The 'communication' module introduces the essence of the communication notion and the technical resources required to establish and operate a communication channel in a safe and reliable manner. In particular, topics covered in this module concern both the physical and software layers. The former includes i.e. wired and wireless communication links, computer networks, their history and development. The latter includes, among others, concepts of packet and protocol as well as ISO/OSI and TCP/IP models. The 'data and information processing' module introduces course participants to problems related to computer programming, including C and Python coding, as well as basic concepts of the description and design of algorithms and their evaluation (e.g. computational complexity). Moreover, the problems of programming paradigms are introduced, with an emphasis on object-oriented programming (including the basics of class diagrams). A collection of good practices in the form of design patterns is also discussed. Furthermore, course participants acquire knowledge of the basics of computer and web application design and architecture, as well as their security (encryption fundamentals). The module is concluded with modern methods of software development and the tools used in this process. In particular, the concepts of agile software development, version control systems (e.g. git) and the role and techniques of automated code testing are presented. The course summary focuses on current TI issues and challenges.								
Prerequisites and co-requisites	Not applicable.								
Assessment methods and criteria	<table><tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr><tr><td>Final score [Test (K - max. 60 pts.; time: 90 min.; form: on-line) + Group assignments (G - max. 3 x 10 pts.; form: home work) + Bonus points (B)]/ max{K + G}</td><td>50.0%</td><td>100.0%</td></tr></table>	Subject passing criteria	Passing threshold	Percentage of the final grade	Final score [Test (K - max. 60 pts.; time: 90 min.; form: on-line) + Group assignments (G - max. 3 x 10 pts.; form: home work) + Bonus points (B)]/ max{K + G}	50.0%	100.0%		
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Example issues/ example questions/ tasks being completed	<div>1. What is a computer?</div> <div>2. What is a programming language?</div> <div>3. What is the computer representation of a web page?</div> <div>4. What is computer programming about?</div> <div>5. What are the basic computer components and how do they influence its overall performance?</div> <div>6. What are the basic CPU components and what are their functions?</div>								
Work placement	Not applicable								