GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Computer systems, PG_00055366		
Field of study	Mechatronics		
Date of commencement of studies	October 2026	Academic year of realisation of subject	2026/2027
Education level	first-cycle studies	Subject group	Obligatory subject group in the field of study 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	1	ECTS credits	4.0
Learning profile	general academic profile	Assessment form	exam
Conducting unit	Faculty of Mechanical Engineering and Ship Technology -> Faculties of Gdańsk University of Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Marek Galewski	
	Teachers		

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	30.0	0.0	0.0	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
Number of study hours	45	6.0	49.0	100

Subject objectives

Providing students basic knowledge about computer systems architecture, communication, data exchange and operating systems.

Teach students basic structural programming with Matlab

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_U09] is able to formulate an algorithm, knows low and high level programming languages and appropriate IT tools for developing computer programmes to control mechatronic system	Student writes simple structural programs in Matlab	[SU1] Assessment of task fulfilment
[K6_U05] is able to use properly chosen tools to compare design solutions of elements and mechatronics systems according to given application and economic criteria (e.g. power demand, speed, costs)	Student uses Matlab at the basic level	[SU4] Assessment of ability to use methods and tools [SU1] Assessment of task fulfilment
[K6_W06] has organised knowledge in the field of informatic that includes architecture of computer systems, programming of computers and embedded systems and elements of software engineering	Student describes elements of computer system architecture	[SW1] Assessment of factual knowledge

<table>
<tr><td>Subject contents</td><td>Course content – lecture
History and current trends in computer science
Computer Arithmetic
Computer Architecture and Components
Principles of CPU Operation and methods for increasing performance
Principles of operation of RAM and hard drives
Cooperation of computer components / Interfaces and buses / Data transmission
BIOS, UEFI, and Operating Systems
Computer and industrial networks
Network infrastructure and protocols
Network services

Learning the basics of structured programming using Matlab:
Elements of programming and algorithmics
MATLAB environment
Introduction to engineering calculations in MATLAB
Programming languages
Basic elements of programming
Basics of algorithmics
Principles of writing the source code
Basic principles of debugging and testing

Course content – project
Basic elements of programming and algorythmics in Matlab, including functions, loops, conditional statements</td></tr>
<tr><td>Prerequisites and co-requisites</td><td></td></tr>
<tr><td>Assessment methods and criteria</td><td>
<table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>Written colloquim - laboratory exercises</td><td>51.0%</td><td>30.0%</td></tr>
<tr><td>Writen exam</td><td>52.0%</td><td>70.0%</td></tr>
<tr><td>Compleeting of laboratory exercies</td><td>60.0%</td><td>0.0%</td></tr>
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</td></tr>
<tr><td>Recommended reading</td><td>
<table>
<tr><td>Basic literature</td><td>Ledin. J. Modern Computer Architecture and Organization: Learn x86, ARM, and RISC-V architectures and the design of smartphones, PCs, and cloud servers

Valentine D.T, Hahn G., Essential MATLAB for Engineers and Scientists (latest edition)

Lowe D. Networking All-in-One Desk Reference For Dummies, (latest edition)</td></tr>
<tr><td>Supplementary literature</td><td>Sradomski W., MATLAB. Praktyczny podręcznik modelowania, Helion , 2015

Webpages of hardware and software companies, e.g. Intel, AMD, nVidia, Microsoft, etc.

Matlab courses at the Mathworks webpage</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
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<tr><td>Example issues/ example questions/ tasks being completed</td><td>A list of 60 examplary questions is provided to student 1 month before the exam, for example:

Describe general organisation and working principles of CPU
What's the difference between serial and parallel transmision?
What's the difference between synchronous and asynchronous transmision?
Present mechanisms for program flow control.
Describe the most important tool used by programmers and software developers.</td></tr>
<tr><td>Practical activites within the subject</td><td>Not applicable</td></tr>
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