GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Operating systems, PG_00045291		
Field of study	Data Engineering, Data Engineering		
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	English
Semester of study	1	ECTS credits	3.0
Learning profile	general academic profile	Assessment form	exam
Conducting unit	Department of Software Engineering -> Faculty of Electronics Telecommunications and Informatics -> Faculties of Gdańsk University of Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Michał Wróbel	
	Teachers	mgr inż. Piotr Sokołowski dr inż. Michał Wróbel	

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	0.0	15.0	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	6.0	39.0	75

Subject objectives

The aim of the course is to familiarize students with the basics of operating systems, including file system, processes, and hardware management. Presentation of the basic commands and shell language structures.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_U07] uses information technologies to improve the acquisition, analysis and processing of data in business applications	The student knows and is able to use text processing programs. The student can design, implement, and test shell scripts.	[SU4] Assessment of ability to use methods and tools [SU1] Assessment of task fulfilment
[K6_U02] prepares and presents convincingly professional presentations of the results of undertaken activities, with their advanced interpretation	Students are able to manage Linux and Windows resources. He/she understands the policy of access to system resources.	[SU5] Assessment of ability to present the results of task [SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information
[K6_W01] identifies conditioning of the processes occurring in the analyzed systems and selects methods for solving them, using the accumulated knowledge and taking into account the mutual relations between the analyzed phenomena	The student knows the basic architectures of computer systems. Understands the concepts of processes, file systems, memory management, and task serialization.	[SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge

Subject contents

Course content – lecture

1. Operating system goals and definitions.
2. Operating system concept and its structual model
3. File concept system and its elements
4. File system, directory tree structure
5. Process model and implementation, fork function
6. Standard input/output, redirection rules, pipe function
7. Process and thread management
8. Context change, multiprocessing
9. Task scheduler, queues, preemptive multitasking
10. Disks and RAM memory management
11. Demand paging
12. Resource security, defenses mechanism
13. Shell properties and tasks
14. Basic shell commands
15. Text manipulation programs
16. Programming in bash language, script role
17. Script writing guidelines, parameters control
18. Operating system installation and configuration
19. Linux features, its distribution

Course content – laboratory

1. Basic shell commands
2. Text processing
3. Programming in shell language, the role of scripts
4. Guidelines for writing scripts, parameter control

Prerequisites and co-requisites

No requirements

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
laboratory	50.0%	50.0%
exam	50.0%	50.0%

Recommended reading

Basic literature

1. Abraham Silberschatz, Peter B. Galvin, Greg Gagne: Silberschatz's Operating System Concepts, Wiley, 2019,
2. Richard Blum, Christine Bresnahan: Linux Command Line and Shell Scripting Bible, Wiley, 2021

Supplementary literature

1. Nemeth E. ed. : Przewodnik administratora systemu UNIX, Helion, 2023
2. Kaczmarek J.: Szkoła systemu Linux, Helion, 2007.

eResources addresses

Example issues/ example questions/ tasks being completed

1. Linux administration
2. Bash scripts writing
3. Scheduling
4. Memory management

Practical activites within the subject

Not applicable

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