GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Operating Systems, PG_00038298		
Field of study	Automation, Robotics and Control Systems		
Date of commencement of studies	October 2026	Academic year of realisation of subject	2026/2027
Education level	second-cycle studies	Subject group	Specialty subject group 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	1	Language of instruction	Polish
Semester of study	2	ECTS credits	2.0
Learning profile	general academic profile	Assessment form	exam
Conducting unit	Department of Control Engineering -> Faculty of Electrical and Control Engineering -> Faculties of Gdańsk University of Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Robert Smyk	
	Teachers		

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	10.0	0.0	10.0	0.0	0.0	20

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	20	4.0	26.0	50

Subject objectives

The aim of the course is to introduce students to the fundamentals of **Linux system administration**, including user and process management as well as data processing in a system environment. During the course, students learn how to use key system tools for searching and processing data, such as **grep, awk, sed, and find**, and gain basic skills in **Bash scripting** for automating administrative tasks.

The course also introduces mechanisms for managing system resources and the fundamentals of **application containerization**. Students learn the principles of creating, configuring, and managing **Docker containers**, and practice using system tools and scripts to automate tasks in the Linux environment.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K7_W02] has a structured knowledge of the application of information systems to improve the reliability, efficiency, speed and mobility of control and management systems	knows the role of the operating system as computer resource management software, it understands the functions of the basic modules included in the operating system	[SW2] Assessment of knowledge contained in presentation
[K7_U12] can program and implement network applications with typical protocols	uses the basic utilities available in text mode and graphics mode to configure and administer the operating system	[SU1] Assessment of task fulfilment

Subject contents	Course content – lecture 1. **Fundamentals of Operating Systems structure, functions, and resource management mechanisms.** 2. **Linux System Administration user, process, and permission management.** 3. **Data Processing data search and manipulation tools (grep, awk, sed, find).** 4. **Bash Programming scripting for task automation.** 5. **System Management resource monitoring, file handling, task scheduling.** 6. **Containerization basics of Docker, container management and deployment.** 7. **Automation and Optimization efficient system management and administrative scripting.**
	Course content – laboratory Laboratory Course Content • **Introduction to working in the Linux environment** logging into the system, navigating the directory structure, and performing basic file and directory operations using command-line tools. • **User and permission management** creating and modifying user accounts, managing groups, and configuring file and directory access permissions. • **Process and resource management** running and controlling processes, monitoring system resources, and using basic administrative tools. • **Data processing in Linux** practical use of tools such as *grep, awk, sed,* and *find* for searching, filtering, and processing data. • **Bash scripting** writing and executing Bash scripts, automating administrative tasks, and performing operations on files and data. • **System task management** scheduling and automating system tasks using built-in Linux mechanisms. • **Application containerization** installation and configuration of the Docker environment, creating container images, and running containers. • **Working with Docker containers** building and running applications in containers, managing container resources, and basic deployment of applications in a containerized environment. • **Automation of administrative tasks** using Bash scripts and system tools to automate routine tasks in the Linux environment.
Prerequisites and co-requisites	Knowledge of basic concepts and skills acquired during the computer science course. Basic knowledge of programming.
Assessment methods and criteria	

Subject passing criteria	Passing threshold	Percentage of the final grade
Rating of individual work during exercise	60.0%	20.0%
Periodic Reporting	60.0%	80.0%

Recommended reading	Basic literature	1. A. Silberschatz, P. B. Galvin, Podstawy systemów operacyjnych, WNT, Warszawa 2006. 2. A. S. Tanenbaum, Systemy operacyjne. Wyd. 3, Helion, Gliwice 2010. 3. W. Stallings, Systemy operacyjne. Struktura i zasady budowy, PWN, Warszawa 2006. 4. K. Stencel, Systemy operacyjne, Wydawnictwo PJWSTK, Warszawa 2004. 5. K. Lal, T. Rak, Linux. Komendy i polecenia. Praktyczne przykłady, Helion, Gliwice 2010.
	Supplementary literature	1. Ł. Sosna, Linux. Komendy i polecenia. Wyd. 3, Helion, Gliwice 2010. 2. W. Stanisławski, D. Raczyński, Programowanie systemowe mikroprocesorów rodziny x86, PWN, Warszawa 2010. 3. B. Goodheart, J. Cox, Sekrety magicznego ogrodu. UNIX System V Wersja 4 od środka. Podręcznik, WNT, Warszawa 2001.
	eResources addresses	
Example issues/ example questions/ tasks being completed	Understanding the principles of working in the Linux command line. Preparation of the basic configuration. Basics of Linux firewall configuration. Administration and management of the basic system services.	
Practical activites within the subject	Not applicable	

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