



Subject card

Subject name and code	Operating Systems, PG_00038297						
Field of study	SYSTEMY OPERACYJNE						
Date of commencement of studies	February 2025		Academic year of realisation of subject		2025/2026		
Education level	second-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	2		ECTS credits		2.0		
Learning profile	general academic profile		Assessment form		assessment		
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	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		5.0		15.0	50
Subject objectives	The aim of the Operating Systems course is to familiarize students with practical aspects of operating systems, including administration, resource management, task automation using shell scripts, and the basics of containerization and working in distributed environments.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K7_U12] can program and implement network applications with typical protocols		Knows the basics of operating system administration.		[SU1] Ocena realizacji zadania		
	[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		Familiar with the principles of environmental protection.		[SW2] Ocena wiedzy zawartej w prezentacji		

Subject contents	Course content – lecture		
	Operating System Fundamentals: System structure, kernel, processes, memory management, file systems. System Administration: Users and permissions, accounts, groups, access rights, system logs. Process and Service Management: Creating, monitoring, and managing processes and services in Linux. Shell Scripting (Bash): Creating and running scripts to automate administrative tasks. Package Management and System Configuration: Software installation, repositories, and editing configuration files. Introduction to Containerization (Docker): Building, running, and managing containers, Dockerfile basics. Distributed Environments and Orchestration (Introduction to Docker Compose/Kubernetes): Fundamentals of organizing and managing services in a distributed environment.		
	Course content – laboratory		
	1. Basic administration using the shell 2. Management and automation using Bash, Python, and other tools 3. Managing the user environment and user management 4. Elements of management using text processing (GREP, AWK, and others) 5. Containerization, Docker 6. Containerization, Kubernetes		
Prerequisites and co-requisites	Knowledge of computer science at an engineering level.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Egzamin	50.0%	40.0%
	Exercises	50.0%	60.0%
Recommended reading	Basic literature	Literatura podstawowa: 1. Silberschatz A., Galvin P. B., Gagne G. <i>Podstawy systemów operacyjnych</i> , Wydawnictwo Helion. (klasyczna i szeroka publikacja omawiająca mechanizmy systemowe w ujęciu teoretycznym i praktycznym) 2. Jacek Krawczyk <i>System operacyjny Linux. Przewodnik dla początkujących administratorów</i> , Helion. (przystępne wprowadzenie do administracji systemem Linux) 3. Sobell M. G. <i>Linux. Biblia</i> , Helion. (kompleksowe źródło wiedzy o administracji, skryptach i narzędziach systemowych)	
	Supplementary literature	Literatura uzupełniająca: 1. Turnbull J. <i>Docker. Praktyczne wprowadzenie</i> , Helion. (praktyczny przewodnik po konteneryzacji i zarządzaniu kontenerami) 2. Nigel Poulton <i>Docker i Kubernetes. Przewodnik dla początkujących</i> , PWN. (zwięzłe i nowoczesne wprowadzenie do środowisk rozproszonych) 3. Shotts W. E. <i>Linux Command Line and Shell Scripting Bible</i> , Wiley. (świetna pozycja do nauki powłoki i skryptowania)	
	eResources addresses		

Example issues/ example questions/ tasks being completed	Explain the role of the operating system kernel in managing computer resources. What are the basic tasks of the kernel? Describe the memory management mechanism in operating systems. What is paging and what are its advantages? How does the Linux operating system manage processes? Describe the differences between a process and a thread. Write a sample Bash shell script that monitors RAM usage and writes the result to a file every minute. What are Docker containers, and what are their key differences from virtual machines?
Practical activities within the subject	Not applicable

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