

Subject card

Subject name and code	Operating systems, PG_00143526						
Field of study	Informatics						
Date of commencement of studies	October 2025		Academic year of realisation of subject			2026/2027	
Education level	Bachelor's 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	2		Language of instruction			Polish	
Semester of study	3		ECTS credits			4.0	
Learning profile	academic		Assessment form			credit	
Conducting unit	Institute of Informatics -> Faculty of Mathematics, Physics and Informatics -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		mgr Łukasz Mielewczyk				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	30.0	0.0	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		0.0		55.0	100
Subject objectives	The purpose of the course is to familiarize students with the principles of operation and methods of operating systems and the basics of system programming.						
Learning outcomes	Course outcome		Subject outcome			Method of verification	
	[INFL3_U02] can precisely formulate questions to deepen one's understanding of a given topic or find missing elements of reasoning		The student is able to use documentation online and tools, the Linux operating system for help and documentation on other commands and programs			[SU4] test/exam - oral or written	
	[INFL3_U07] uses advanced functionalities of operating systems, especially related to network aspects		can use the Linux operating system from the command line and graphical interface			[SU4] test/exam - oral or written	
	[INFL3_W08] has knowledge of network technologies, including basic communication protocols, security and construction of network applications		knows the commands that are used to execute system command and knows the main elements, related to the architecture of computer systems, and the principles of the operating system			[SW4] test/exam - oral or written	
	[INFL3_W07] is familiar with the most important elements of computer systems architecture and the principles of operating systems with particular emphasis on concurrency, task serialization and memory and process management		knows the commands that are used to execute system commands, the most important elements, related to the architecture of computer systems and the principles of the operating system			[SW4] test/exam - oral or written	

Subject contents	1. Popular operating systems: features, types, organization, architecture, structure, operation, interoperabilit 2. Examples of components and tools offered by operating systems. 3. File systems: examples of file systems, file types, access methods, system directory structure, and the basics of file system management. 4. Shells: examples of shells, startup files, environment variables, command interpreters, and scripting. 5. Fundamentals of system administration: managing user accounts and authorization, logging, and tools for monitoring and managing events. 6. Management of computer system components: processor operation, computer memory and storage management, computer system bootup. 7. Processes and threads: the concept of a process, process behavior, interprocess communication, thread management, synchronization methods, and example problems. 8. Resource management: process and thread scheduling, deadlocks, and other example problems. 9. Fundamentals of systems programming: resource management, fundamentals of concurrent programming. 10. Security and Safety: principles of operating system and computer system security, techniques for attacking operating systems, and malware attack techniques. 11. Virtualization: virtualization techniques and how hypervisors work.		
Prerequisites and co-requisites	Passing the subjects: Wstęp do programowania (Introduction to programming), Warsztat programisty (Programmer's workshop). Ability to use a command interpreter and basic knowledge of C programming.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Laboratory exercises: tests	51.0%	50.0%
	Lecture: test	51.0%	50.0%
Recommended reading	Basic literature	1. A. S. Tanenbaum, <i>Systemy operacyjne. Wydanie IV</i>, tłumaczenie: R. Meryk; M Szczepaniak, Helion, Gliwice 2015. 2. R. Love, <i>Linux. Programowanie systemowe</i>. Wydanie II, tłumaczenie: J. Janusz, Helion, Gliwice 2014. 3. M. G. Sobell, <i>Linux. Programowanie w powłoce. Praktyczny przewodnik. Wydanie III</i>, tłumaczenie: R. Górczyński, Helion, Warszawa 2013. 4. A. Silberschatz; P. B. Galvin, <i>Podstawy systemów operacyjnych</i>, Wydawnictwa Naukowo-Techniczne, Warszawa 2006. 5. N. Matthew; R. Stones, <i>Linux Programowanie</i>, Wydawnictwo RM, Warszawa 1999. 6. M. Bach, <i>Budowa Systemu Operacyjnego UNIX</i>, Wydawnictwa Naukowo-Techniczne, Warszawa 1995	
	Supplementary literature	1. E. Nemeth; G. Snyder; T. R. Hein; B. Whaley; D. Mackin , <i>Unix i Linux. Przewodnik administratora systemów. Wydanie V</i>, tłumaczenie: L. Sagalara, Helion, Gliwice 2018. 2. K. Kuźniar; K. Lal; T. Rak , <i>Programowanie w Linuksie. Ćwiczenia</i>, Helion, Gliwice 2012. 3. J. Fusco, <i>Linux. Niezbędnik programisty</i> , tłumaczenie: M. Szczepaniak, Helion, Gliwice 2009. 4. M. K. Johnson; E. W. Troan, <i>Oprogramowanie użytkowe w systemie Linux</i>, Wydawnictwa Naukowo-Techniczne, Warszawa 2000.	
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Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		

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