

Subject card

Subject name and code	Operating Systems, PG_00198496						
Field of study	Informatics						
Date of commencement of studies	October 2026	Academic year of realisation of subject			2027/2028		
Education level	Bachelor's studies	Subject group			Obligatory subject group 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			5.0		
Learning profile	academic	Assessment form			exam		
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	30.0	0.0	30.0	0.0	0.0	60
	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	60		0.0		65.0	125
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		
	[INFOL3_U06] is able to select and apply appropriate IT methods and tools to solve complex problems, is able to use acquired knowledge by appropriately selecting sources and information derived from them, and perform evaluation, critical analysis, and synthesis of this information						
	[INFOL3_U02] is able to use his/her knowledge of higher mathematics to model and solve complex problems						
	[INFOL3_W07] knows and understands 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		
[INFOL3_W08] knows and understands advanced concepts in the field of network technologies, including 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			

Subject contents	<ol style="list-style-type: none"> 1. Popular operating systems: features, types, organization, architecture, structure, operation, interoperability 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	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 40%;">Subject passing criteria</th> <th style="width: 30%;">Passing threshold</th> <th style="width: 30%;">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td>Laboratory exercises - tests</td> <td>51.0%</td> <td>50.0%</td> </tr> <tr> <td>Lecture - exam</td> <td>51.0%</td> <td>50.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	Laboratory exercises - tests	51.0%	50.0%	Lecture - exam	51.0%	50.0%
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Recommended reading	Basic literature	<ol style="list-style-type: none"> 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. Wydanie II</i>, 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	<ol style="list-style-type: none"> 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. Niezbędny programista</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. 										
	eResources addresses											
Example issues/ example questions/ tasks being completed												
Work placement	Not applicable											

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