



## Subject card

Subject name and code	Operating Systems, PG_00047649						
Field of study	Informatics						
Date of commencement of studies	October 2024		Academic year of realisation of subject		2024/2025		
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		blended-learning		
Year of study	1		Language of instruction		Polish		
Semester of study	2		ECTS credits		5.0		
Learning profile	general academic profile		Assessment form		exam		
Conducting unit	Department of Software Engineering -> Faculty of Electronics, Telecommunications and Informatics						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Michał Wróbel				
	Teachers		dr inż. Michał Wróbel  mgr inż. Marcin Kwiatkowski  dr inż. Wojciech Siwicki  dr inż. Adam Kaczmarek  dr inż. Piotr Rajchowski  mgr inż. Olga Błaszkievicz  dr inż. Piotr Grall  dr inż. Elżbieta Zamiar				
Lesson types and methods of instruction	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: 8.0						
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		5.0		60.0	125
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_W44] knows and understands, to an advanced extent, architecture, design principles and methods of hardware and software support for local and distributed information systems, including computing systems, databases, computer networks and information applications, as well as the principles of human-computer interaction, the operation and evaluation criteria of data processing, storage and transfer methods, including computational algorithms, artificial intelligence and data mining as well as standards and methods of IT systems administration, monitoring of processes and robustness to undesirable phenomena and activities	The student can manage the Linux operating system.	[SW1] Assessment of factual knowledge
	[K6_U03] can design, according to required specifications, and make a simple device, facility, system or carry out a process, specific to the field of study, using suitable methods, techniques, tools and materials, following engineering standards and norms, applying technologies specific to the field of study and experience gained in the professional engineering environment	The student knows and is able to use text processing programs. She or he is able to design, implement and test shell scripts	[SU1] Assessment of task fulfilment [SU3] Assessment of ability to use knowledge gained from the subject
	[K6_W04] knows and understands, to an advanced extent, the principles, methods and techniques of programming and the principles of computer software development or programming devices or controllers using microprocessors or programmable elements or systems specific to the field of study, and organisation of systems using computers or such devices	The student knows the basic architectures of computer systems. She/he understands the concept of processes, file systems, memory management and scheduling tasks.	[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects
	[K6_W03] knows and understands, to an advanced extent, the construction and operating principles of components and systems related to the field of study, including theories, methods and complex relationships between them and selected specific issues - appropriate for the curriculum	The student defines the features of the file system. The student describes disk and RAM management. She or he understands the policies of task scheduling in the kernel of the operating system.	[SW1] Assessment of factual knowledge
Subject contents	<ol style="list-style-type: none"> <li>1. Operating system goals and definitions.</li> <li>2. Operating system concept and its structural model</li> <li>3. File concept system and its elements</li> <li>4. File system, directory tree structure</li> <li>5. Process model and implementation, fork function</li> <li>6. Standard input/output, redirection rules, pipe function</li> <li>7. Process and thread management</li> <li>8. Context change, multiprocessing</li> <li>9. Task scheduler, queues, preemptive multitasking</li> <li>10. Disks and RAM memory management</li> <li>11. Demand paging</li> <li>12. Resource security, defenses mechanism</li> <li>13. Shell properties and tasks</li> <li>14. Basic shell commands</li> <li>15. Text manipulation programs</li> <li>16. Programming in bash language, script role</li> <li>17. Script writing guidelines, parameters control</li> <li>18. Operating system installation and configuration</li> <li>19. Linux features, its distribution</li> </ol>		

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%
	eCourse	50.0%	10.0%
	exam	50.0%	40.0%
Recommended reading	Basic literature	1. Silberschtz A. ed. : Operating System Concepts, Wiley, 2021, 2. Albing C., Vossen JP: bash Cookbook: Solutions and Examples for bash Users, 2017,	
	Supplementary literature	1. Nemeth E. ed. : Przewodnik administratora systemu UNIX, NT, 1998, 2. Kaczmarek J.: Szkoła systemu Linux, Helion, 2007.	
	eResources addresses	Podstawowe <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=35980">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=35980</a> - eNauczanie course Adresy na platformie eNauczanie: Systemy Operacyjne - 2023/24 - Moodle ID: 35980 <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=35980">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=35980</a>	
Example issues/ example questions/ tasks being completed	1. Linux administration 2. Bash scripts writing 3. Scheduling 4. Memory management		
Work placement	Not applicable		

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