



Subject card

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|---|---|---|----------|-------------------------------------|--|------------|-----|
| Subject name and code | Operating Systems, PG_00047649 | | | | | | |
| Field of study | Informatics | | | | | | |
| Date of commencement of studies | October 2023 | Academic year of realisation of subject | | | 2023/2024 | | |
| 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. Piotr Grall dr inż. Piotr Rajchowski dr inż. Elżbieta Zamiar dr inż. Wojciech Siwicki dr inż. Michał Wróbel mgr inż. Marcin Kwiatkowski dr inż. Adam Kaczmarek mgr inż. Olga Błaszkiwicz | | | | | |
| 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_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_W43] Knows and understands, to an advanced extent, standards and methods of IT systems administration, monitoring of processes occurring in them and immunising them to undesirable phenomena and activities | Student is able to administer Linux and Windows resources. She or he understands the policy of access to system resources. | [SW1] Assessment of factual knowledge [SW2] Assessment of knowledge contained in presentation |
| | [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 |
| | [K6_U42] can apply tools and methods of designing, optimization, monitoring, management, increasing reliability and protection from safety hazards in local and distributed information systems and applications | The student understands the concept of processes in the computer system and their management in the operating system. Students is be able to manage the running processes. | [SU1] Assessment of task fulfilment [SU4] Assessment of ability to use methods and tools |
| Subject contents | <ol style="list-style-type: none"> 1. Operating system goals and definitions. 2. Operating system concept and its structural model 3. File concept system and its elements 4. File system, directory tree structure 5. Process model and implementation, fork function 6. Standard input/output, redirection rules, pipe function 7. Process and thread management 8. Context change, multiprocessing 9. Task scheduler, queues, preemptive multitasking 10. Disks and RAM memory management 11. Demand paging 12. Resource security, defenses mechanism 13. Shell properties and tasks 14. Basic shell commands 15. Text manipulation programs 16. Programming in bash language, script role 17. Script writing guidelines, parameters control 18. Operating system installation and configuration 19. Linux features, its distribution | | |
| Prerequisites and co-requisites | No requirements | | |

| Assessment methods and criteria | Subject passing criteria | Passing threshold | Percentage of the final grade |
|--|---|--|-------------------------------|
| | exam | 50.0% | 40.0% |
| | eCourse | 50.0% | 10.0% |
| | laboratory | 50.0% | 50.0% |
| 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 | Adresy na platformie eNauczanie: Systemy Operacyjne - 2023/24 - Moodle ID: 35980 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=35980 | |
| Example issues/ example questions/ tasks being completed | 1. Linux administration 2. Bash scripts writing 3. Scheduling 4. Memory management | | |
| Work placement | Not applicable | | |