

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Operating systems		Code 1010334531010330105
Field of study Information Engineering	Profile of study (general academic, practical) (brak)	Year /Semester 2 / 3
Elective path/specialty -	Subject offered in: Polish	Course (compulsory, elective) obligatory
Cycle of study: First-cycle studies	Form of study (full-time, part-time) part-time	
No. of hours Lecture: 16 Classes: - Laboratory: 8 Project/seminars: -		No. of credits 4
Status of the course in the study program (Basic, major, other) (brak)		(university-wide, from another field) (brak)
Education areas and fields of science and art technical sciences		ECTS distribution (number and %) 4 100%
Responsible for subject / lecturer: dr Jerzy Bartoszek email: jerzy.bartoszek@put.poznan.pl tel. 61 665-3713, 61 665-2378 Wydział Elektryczny ul. Piotrowo 3A 60-965 Poznań		
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	knows and understands the advanced knowledge in the field of basic programming constructs, algorithms implementation, paradigms and programming styles, methods for verifying the correctness of programs, formal languages, compilers and platforms platform [K1_W05 (P6S_WG)]
2	Skills	can use programming environments and platforms to write, execute and test simple coded programs in the imperative, object and declarative programming languages, use analytical, simulation and experimental methods for this purpose [K1_U10 (P6S_UW)]
3	Social competencies	is ready to critically evaluate his knowledge in the field of computer science and recognize the importance of knowledge in solving cognitive and practical problems in the area of computer science [K1_K01 (P6S-KK)]
Assumptions and objectives of the course: Description of the concepts that underlie operating systems with examples that pertain to the most popular operating systems, including: Unix, Linux and Windows.		
Study outcomes and reference to the educational results for a field of study		
Knowledge: 1. Student knows the principles of operation and understands knowledge in the field of computer systems architectures, operating system operating principles and their types, basic processes occurring in the life cycle of comp. and operating systems. - [[K1_W06 (P6S_WG)]]		
Skills: 1. can make a critical analysis of the functioning of computer hardware, operating system, computer networks (or parts thereof) and evaluate these solutions - [[K1_U11 (P6S_UW)]] 2. can use programming environments and platforms to write, execute and test simple coded programs in the imperative, object and declarative programming languages, use analytical, simulation and experimental methods for this purpose - [[K1_U10 (P6S_UW)]] 3. is able to assess the usefulness of routine methods and tools for solving simple engineering tasks typical for computer science and to select and use appropriate technologies; in the identification and formulation of engineering task specifications and their solution - make an initial economic assessment of the proposed solutions and engineering actions - [[K1_U22 (P6S_UW)]]		
Social competencies:		

1. is willing to take care of the profession and achievements of the IT profession; is aware of the importance and understands the non-technical aspects and effects of the engineer-informatics activity and the related responsibility for the decisions made and compliance with the ethics of the profession of IT - [[K1_K02 (P6S-KR)]]

Assessment methods of study outcomes		
Lectures: written tests, pass criterion of 50.1% points.		
Laboratory: tests, evaluation of completed projects and reports		
Course description		
<p>Lectures:</p> <p>Operating-system structures. Process Concept. Threads and Concurrency. CPU scheduling: Scheduling Criteria, Scheduling Algorithms. Job scheduling. Process management and interprocess Communication. Process synchronization: The Critical-Section Problem, Synchronization Hardware, Semaphores, Regions and Monitors, Classic Problems of Synchronization. Deadlocks. Memory management: Contiguous Memory Allocation, Paging, Segmentation. Virtual memory. File management: File-System Structure, File-System Implementation, Allocation Methods, Free-Space Management. I/O systems: I/O Hardware, Transforming I/O Requests to Hardware Operations. Protection and security: Access Matrix, Access Control List, User Authentication.</p> <p>Course update 2017: Case studies.</p> <p>Laboratory:</p> <p>Projects illustrating mechanisms and events in operating systems.</p> <p>Teaching methods:</p> <p>lectures - with multimedia presentation, additional topics included in Moodle course</p> <p>laboratory - with multimedia presentation, additional topics included in Moodle course, used tools enable students to perform tasks at home</p>		
Basic bibliography:		
1. Silberschatz A., Galvin P.B., Gagne G., Operating system concepts (9th/10th Edition), John Wiley & Sons, New York, 2012/2018		
Additional bibliography:		
1. Silberschatz A., Galvin P.B., Gagne G., Operating System Concepts with Java, (7th Edition), John Wiley & Sons, New York, 2006		
Result of average student's workload		
Activity	Time (working hours)	
1. participation in lectures	16	
2. participations in labs.	8	
3. exam, consultation	6	
4. project	40	
5. report	5	
6. studying additional problems mentioned in the lectures	25	
Student's workload		
Source of workload	hours	ECTS
Total workload	100	4
Contact hours	30	1
Practical activities	53	2