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Prefile of study   Profile of study   General Academic, practical   Carak			STUDY MODULE D	ESCRIPTIO	N FORM			
Information Engineering (general academic, practical) (brak) 2 / 3  Elective path/specialty - Subject offered in: polish Obligatory  Cycle of study:  First-cycle studies		•						
Information Engineering   Ciprak   Subject offered in:	Field of	study			,	Year /Semester		
Cycle of study:  First-cycle studies  First-cycle studies  Form of study (full-time, part-time)  part-time  part-time  part-time    (brak)	Info	rmation Enginee	ring		ademic, practical)	2/3		
Form of study (full-time.part-time)   Form of study (full-time.part-time)   Part-time	Elective	e path/specialty	-					
No. of hours Lecture: 16 Classes: - Laboratory: 8 Project/seminars: - 4  Status of the course in the study program (Basic, major, other) (brak)  Education areas and fields of science and art  technical sciences  Responsible for subject / lecturer:  dr Jerzy Bartoszek email: jerzy, bartoszek @put.poznan.pl tel. 665-3724, 665-3729 Wydział Elektryczny ul. Piotrowo 3A 60-965 Poznah  Prerequisites in terms of knowledge, skills and social competencies:  1 Knowledge Skills Student is able to use programming environments and platforms to write, perform and test simple programs coded in imperative programming languages.  3 Social competencies  Student is aware of and understands the importance and impact of non-technical aspects of engineering systems [K_W06]  Skills:  1. Student knows the principles of operating systems [K_W06]  Skills:  1. Student is able to use programming environments may program on the most popular operating systems [K_W06]  Skills:  1. Student knows the principles of operating systems [K_W06]  Skills:  1. Student is able to use programming environment is programming modules of operating systems [K_U11] 2. Student is able to use programming environments and platforms to write, perform and test simple programs coded in imperative programming tenying one of non-technical aspects of engineering activity and the associated responsibility for decisions.  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 is able to make a critical analysis of the way the operating system (or portion of it) works [K_U11]  2. Student is able to use programming environments and platforms in programming modules of operating systems [K_U10]  3. Student is able to use seess the usefulness of routine methods and tools to solve simple engineering tasks and	Cycle o	f study:		Form of study (fu	Ill-time,part-time)	<u> </u>		
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Education areas and fields of science and art  technical sciences  Responsible for subject / lecturer:  dr Jerzy Bartoszek email: Jerzy bartoszek@put.poznan.pl tel. 665-3724, 665-3729 Wydzial Elektryczny ul. Piotrowo 3A 60-965 Poznań  Prerequisites in terms of knowledge, skills and social competencies:    Knowledge		0.0000		1		eld)		
technical sciences  Responsible for subject / lecturer:  dr Jerzy Bartoszek email: jerzy, bartoszek@put.poznan.pl tel. 665-3724, 665-3729 Wydział Elektryczny ul. Piotrowo 3A 60-965 Poznań  Prerequisites in terms of knowledge, skills and social competencies:  Knowledge  Student has structured and theoretically founded knowledge of the basic algorithms and analysis techniques for designing algorithms, abstract data structures and their implementation.  Skills  Student is able to use programming environments and platforms to write, perform and test simple programs coded in imperative programming languages.  Social competencies  Student is aware of and understands the importance and impact of non-technical aspects of engineering activity and the associated responsibility for decisions.  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 operating systems [K_W06]  Skills:  1. Student is able to make a critical analysis of the way the operating system (or portion of it) works [K_U11]  2. Student is able to use programming environments and platforms in programming modules of operating systems [K_U10]  3. Student is able to assess the usefulness of routine methods and tools to solve simple engineering tasks and apply appropriate technologies [K_U22]  Social competencies:  Is the technologies [K_U22]			(brak)		(	(brak)		
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Assessment methods of study outcomes	associ	ated responsibility for	decisions [K_K02]					
			Assessment method	ds of study (	outcomes			

Assessment methods of study outcomes				
Lectures: written tests, pass criterion of 50.1% points.				
Laboratory: tests, evaluation of completed projects and reports				
Course description				

# Faculty of Electrical Engineering

#### Lectures:

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. Case studies.

### Laboratory:

Projects illustrating mechanisms and events in operating systems.

## Basic bibliography:

- 1. Silberschatz A., Galvin P.B., Gagne G., Operating system concepts (Eight Edition), John Wiley & Sons, New York, 2008
- 2. Stallings W., Operating Systems: Internals and Design Principles (7th Edition), Prentice Hall, 2011)

#### Additional bibliography:

1. Silberschatz A., Galvin P.B., Gagne G., Operating System Concepts with Java, (Seventh 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