



COURSE DESCRIPTION

Course code	full-time studies	
	part-time-studies	
Course name	Systemy Operacyjne 2	
Course name in English	Operating Systems 2	
Valid from academic year	2022/23	

PLACEMENT IN THE TEACHING PROGRAM

Field of study	Computer Science
Level of education	1st degree
Studies profile	General
Form and method of teaching classes	Full-time and part-time studies
Specialization	All specializations
Organizational unit responsible for the course	Department of Information Systems
Course coordinator	Arkadiusz Chrobot, PhD
Approved by	Dean of the Faculty of Electrical Engineering, Automatic Control and Computer Science Roman Deniziak, KUT prof., DSc, PhD

GENERAL CHARACTERISTIC OF THE COURSE

Course affiliation	Major Subject	
Course status	Mandatory	
Language	English	
Semester	full-time studies	4th Semester
	part-time-studies	4th Semester
Requirements	Operating Systems 1	
Exam (YES/NO)	Yes	
ECTS	5	

Course form		lecture	classes	laboratory	project	other
Hours per semester	full-time studies	30		30		
	part-time-studies	18		18		

LEARNING RESULTS

Category	Result Symbol	Learning Results	References to the field of study results
Knowledge	W01	The student knows how the subsystems of a selected contemporary operating system work.	INF1_W11
	W02	The student knows the implementations of event handling, process and memory management in a selected contemporary operating system.	INF1_W11
	W03	The student knows issues related to developing device drivers for a selected contemporary operating system.	INF1_W11
Skills	U01	The student is able to develop kernel modules for Linux.	INF1_U11
	U02	The student is able to develop a simple device drivers for Linux.	INF1_U11
Social competence	K01	The student understands to what extent the knowledge about the internal organization and work of an operating system helps her or him in solving problems in Computer Science. The student understands the need of expanding that knowledge with the help of reliable sources.	INF1_K1
	K02	The student is able to reliably assess her or his skills related to operating systems.	INF1_K2

COURSE CONTENT

Course Form	Content
lecture	<ol style="list-style-type: none"> 1. General characteristic of a selected contemporary operating system. 2. Process management in a selected contemporary operating system. 3. O(1) and CFS algorithms-based process scheduling. 4. System calls and their implementation. 5. Interrupts handling 6. Bottom halves 7. Kernel threads synchronization. 8. Time management and handling events related to time. 9. Memory management (buddy system, slab allocator) 10. Virtual File System 11. Device drivers 12. Block Input/Output Layer 13. Process address space management 14. Networking in a selected contemporary operating system.
laboratory	<ol style="list-style-type: none"> 1. Introduction to the Linux kernel modules development. 2. Memory management in Linux kernel. 3. Linux kernel data structures. 4. File systems: procs and sysfs. 5. Linux kernel threads and their synchronization. 6. Bottom halves. 7. Timers. 8. Device drivers. 9. Netlink and generic netlink sockets.

LEARNING RESULTS VERIFICATION METHODS

Result Symbol	Learning results verification methods					
	Oral Exam	Written Exam	Midterm	Project	Report	Other
W01		X				
W02		X				
W03		X				
U01						X
U02						X
K01						X
K02						X

ASSESSMENT FORMS AND CRITERIA

Course Form	Assessment Form	Assessment Criteria
lecture	exam	The student should obtain at least 50% of points at the exam.
laboratory	passing grade	The student should obtain at least 50 points by completing assignments at the laboratory classes.

STUDENT'S VOLUME OF WORK

ECTS Balance													
No.	Activity Type	Student Involvement										Unit	
		full-time studies					part-time-studies						
		Lec	C	Lab	P	S	Lec	C	Lab	P	S		
1.	Participation in classes according to the schedule	30		30			18		18			h	
2.	Other (consultations, exams)	2		2			2		2			h	
3.	Total with the direct assist of an academic teacher	64					40					h	
4.	Number of ECTS, that the student obtains with the direct assist of an academic teacher	2,56					1,6					ECTS	
5.	Hours of unassisted student work	61					85					h	
6.	Number of ECTS that student obtains working unassisted	2,44					3,4					ECTS	
7.	Practical classes volume of work	30					18					h	
8.	Number of ECTS obtained by student at practical classes	1,2					0,72					ECTS	
9.	Total student's volume of work expressed in hours	125					125					h	
10.	ECTS	5										ECTS	

BIBLIOGRAPHY

1. Robert Love, "Kernel Linux Development", Third Edition, Addison-Wesley Professional, Upper Saddle River NJ, 2010
2. Jonathan Corbet, Alessandro Rubini, Greg Kroah-Hartman, "Linux Device Drivers", <http://lwn.net/Kernel/LDD3/>
3. Wolfgang Mauerer, "Professional Linux Kernel Architecture", Wiley Publishing, Inc., Indianapolis, 2008
4. Sreekrishnan Venkateswaran, "Essential Linux Device Drivers", Prentice Hall, Upper Saddle River, 2008
5. Daniel P. Bovet, Marco Cesati, "Understanding the Linux Kernel, 3rd Edition", O'Reilly Media, Sebastopol 2005