(faculty stamp)

KARTA PRZEDMIOTU

1. Course title: SPECIALIZED OPERATING STSTEMS	**2. Course code: SOS**
3. Validity of course description: 2018/2019	
4. Level of studies: BA, BSc programme	
5. Mode of studies: INTRAMURAL STUDIES	
6. Field of study: INFORMATICS	
7. Profile of the studies: comprehensive	
8. Specialty: ALL	
9. Semester: V, VI	
10. Faculty teaching the course: Faculty of Automatic Control, Electronics and Computer Science	
11. Course instructor: Błażej Adamczyk **Laboratory course instructor:** Aleksandra Gruca	
12. Course classification: common courses	
13. Course status: obligatory	
14. Language of instruction: English	
15. Pre-requisite qualifications: Operating systems, Fundamentals of computer programming	
16. Course objectives: The goal of the course is to introduce students into the topics related to a key characteristics, architecture and services of specific operating systems such as distributed operating systems or real-time operating systems and virtual machine monitors. Laboratory classes are focused on solving advanced problems are related to configuration, administration and management of server operating systems. The students attending to the course should have knowledge about basic concepts and problems related to operating systems and theory of computer science. Pre-requisite subjects are operating systems, theory of computer science and fundamentals of computer programming.	
17. Description of learning outcomes:	

Nr	Learning outcomes description	Method of assessment	Teaching methods	Learning outcomes reference code
1.	Student acquires knowledge on fundamentals of specific and distributed operating systems operating systems	final test	lecture	K1A_W10 K1A_W11 K1A_W13 K1A_W14 K1A_W13
2.	Student acquires practical knowledge about Linux and Windows operating systems	laboratory tasks	laboratory	K1A_U08 K1A_U21 K1A_U29

3.	Student acquires practical knowledge and basic skills in configuring operating systems for server-related tasks	laboratory tasks	laboratory	K1A_U19 K1A_U21
4.	Student acquires knowledge and basic skills in administer and managing server operating systems	laboratory tasks	laboratory	K1A_U10 K1A_U19 K1A_U21
5.	Student acquires knowledge and basic skills in reading reference literature and technical documentation	laboratory tasks	laboratory	K1A_U01

18. Teaching modes and hours

Lecture	Classes	Laboratory	Project	BA/MA Seminar
30	-	30	-	-

Lectures

The aim of the course is to introduce students to the concepts of general and specific-purpose operating systems, their functions, architectures, resource management methods, process synchronization, file systems and communication protocols. Subject covers the basic concepts of distributed (network) operating systems and specific-purpose systems such as virtualization systems, real-time operating systems, multimedia operating systems and embedded systems. In particular, the following aspects of operating systems are discussed: problems of time management in distributed, real-time and multimedia operating systems. Techniques of clock synchronization in computer systems. Resource management methods, scheduling and synchronization in distributed and specific-tasks operating systems. Issues related to security and reliability of operating systems. Real-time processes and processing time requirements. Selected algorithms dedicated to processor and memory management in real-time and distributed systems. QNX as an example of real-time operating system. Concepts of virtualization systems including details about Xen Hypervisor. Basic concepts related to multimedia operating systems. Multimedia streaming, compression, QoS (quality of service) parameters. Multimedia operating systems requirements, methods of processor and memory management. Basic concepts, function and architecture of embedded operating systems.

Laboratory:

1. Linux - access control list (ACL)
2. Programming in Linux
3. Linux - dualboot configuration
4. Linux - event logging and system security
5. Linux - X-Window System
6. Linux - kernel
7. Windows - remote installation
8. Windows - Active Directory
9. Windows - application programming interface (API)
10. Windows - PowerShell framework
11. Windows - RAID data storage
12. Windows - event logging

19. Examination: no

20. Primary sources:

1. A. Silberschatz,, P. B. Galvin, G. Gagne: Operating System Concepts. Wydanie 10, Wiley, 2018.
2. A. Silberschatz, P.G.Galvin, G. Gagne: Podstawy Systemów Operacyjnych. Wydanie 7, WNT, Warszawa 2006 (język polski)
3. A. S. Tanenbaum, H. Bos: Modern Operating Systems. Wydanie 4, Prentice-Hall Inc., 2015.
4. W. R. Stevens: Programowanie w środowisku systemu UNIX. WNT, Warszawa 2014.
5. W. Stallings: Systemy operacyjne. Struktura i zasady budowy. Wydawnictwo Naukowe PWN, 2006.
6. D. Chisnall, The Definitive Guide to the Xen Hypervisor. Pearson Education, 2007.

21. Secondary sources:

1. Ł. Sosna: Linux. Komendy i polecenia. Helion, 2014
2. D. P. Bovet i M. Cesati, Understanding the Linux Kernel. O'Reilly Media, Inc., 2005
3. H. Tsuji, T. Watanabe: Linux Internet Server. Czarna księga, Acrobyte, Helion, 2001
4. T. Parker: Linux. Księga eksperta. Helion, 1999
5. Linux manual
6. E.Bott, C. Siechert, C. Stinson: Windows 10 Inside Out, Second Edition. Microsoft Press, 2016
7. A. Podstawczyński: Linux. Praktyczne rozwiązania. ISBN: 83-7197-326-8
8. Dokumentacja w internecie, np.: debian.org, linuxquestions.org

22. Total workload required to achieve learning outcomes

Lp.	Teaching mode	Contact hours / Student workload hours
1.	Lecture	30/5
2.	Classes	-/-
3.	Laboratory	30/15
4.	Project	-/-
5.	BA/MA Seminar	-/-
6.	Other	10/10
	Total number of hours:	70/30

23. Total hours:	100
24. Number of ECTS credits:	3(1 - sem.5, 2 – sem6)
25. Number of ECTS credits allocated for contact hours:	2
26. Number of ECTS credits allocated for in-practice hours (laboratory classes, projects):	1

27. Comments: -

Approved:

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(date, Instructor's signature) (*date, the Director of the Faculty Unit signature)*

[1] 1 ECTS credit – 25-30 student workload hours