KARTA PRZEDMIOTU

I. Dane podstawowe

Nazwa przedmiotu	**Systemy operacyjne**
Nazwa przedmiotu w języku angielskim	**Operating systems**
Kierunek studiów	**Informatyka**
Poziom studiów (I, II, jednolite magisterskie)	**I**
Forma studiów (stacjonarne, niestacjonarne)	**stacjonarne**
Dyscyplina	
Język wykładowy	**English**

Koordynator przedmiotu/osoba odpowiedzialna	**dr Viktor Melnyk prof. KUL**

Forma zajęć *(katalog zamknięty ze słownika)*	Liczba godzin	semestr	Punkty ECTS
wykład	15	4	4
konwersatorium			
ćwiczenia	30	4	
laboratorium			
warsztaty			
seminarium			
proseminarium			
lektorat			
praktyki			
zajęcia terenowe			
pracownia dyplomowa			
translatorium			
wizyta studyjna			

Wymagania wstępne	W1 - knowledge of informatics covered by the high school program. W2 - basic knowledge of computer architecture. W3 - knowledge of the basics of programming. W4 - Good computer skills.

II. Cele kształcenia dla przedmiotu

C1 - to familiarize students with the basic concepts and ideas used in operating systems, both historical and contemporary.
C2 - to present specific solutions used in Unix and Windows operating systems families.

III. Efekty uczenia się dla przedmiotu wraz z odniesieniem do efektów kierunkowych

Symbol	Opis efektu przedmiotowego	Odniesienie do efektu kierunkowego
WIEDZA		
W_01	Theoretical knowledge of operating systems, used data structures and algorithms	K_W01 K_W04 K_W06
W_02	The student knows the functions of basic directories	K_W01 K_W04 K_W06
W_03	The student knows devices naming and representation of them as files	K_W01 K_W04 K_W06
W_04	The student has knowledge of the basic shell commands and utilities commands	K_W01 K_W04 K_W06
W_05	The student knows the basic configuration of DNS, SMTP, POP3, WWW	K_W01 K_W04 K_W06
UMIEJĘTNOŚCI		
U_01	Ability to use the developer tools on Unix/Linux	K_U01 K_U02
U_02	Knowledge of the selected API system functions of the Unix/Linux operating system	K_U01 K_U02 K_U03 K_U04 K_U19
U_03	Basic ability to create and manage processes on Unix/Linux	K_U01 K_U02 K_U03 K_U04 K_U19
U_04	The student is able to install the desired distribution of Unix/Linux	K_U01 K_U02
U_05	The student is able to manage users and security groups, as well as read and give them permissions to the files	K_U01 K_U02
U_06	The student is able to mount and unmount the device in the directory tree	K_U01 K_U02
U_07	The student is able to configure basic system settings from the command line	K_U01 K_U02
U_08	The student is able to test basic behavior of the network with support of the system tools	K_U15
U_09	The student is able to run basic services available in Unix/ Linux	K_U01 K_U02 K_U04
U_10	The student is able to write simple scripts in a shell	K_U03 K_U07 K_U08 K_U09 K_U10
KOMPETENCJE SPOŁECZNE		
K_01	skillfully solve complex problems with which they can meet in life, using the known operating system principles, objectively assessing the results	K_K01 K_K03 K_K04
K_02	follow ethical standards applicable in the IT industry	K_K05 K_K06
K_03	work efficiently, in teams and individually, skillfully assessing priorities in the implementation of the project	K_K02 K_K03 K_K04

IV. Opis przedmiotu/ treści programowe

LECTURES

1. Essence, the role and tasks of the operating system. Types of operating systems. The structure of the system. Historical sketch of development of operating systems - from batch to interactive systems.

2. The evolution of operating systems. The properties and desired features of operating systems. Processes, processors, concurrent processing. Resources, processes and threads.
3. Planning the processor allocation. Planning algorithms and assessment criteria. Implementation of processes and threads planning algorithms.
4. System mechanisms for process synchronization. Communication between processes - mutual exclusion, synchronization and locking. Semaphores - principle of operation, implementation. The use of semaphores in inter-process communication.
5. Memory hierarchy. Main memory management. Main memory control and allocation.
6. Memory management - objectives. Virtual memory - implementation.
7. File systems - folders, sharing and data protection. Logical and physical organization of the file system. Methods of organization of the auxiliary memory. The integrity of the file system.
8. Input / output system and its mechanisms. Types of input-output devices. The structure of the input-output mechanism. Buffering.

CLASSES
1. Installation of the system.
2. Introduction and maintenance of the file system in Linux.
3. Linux - console. Operations on directories and files. User accounts. Mounting and unmounting of the devices.
4. Processes, variables, programs, files, standard output and input.
5. Filters, standard streams and stream processing.
6. Creating shell scripts for the Linux operating system.
7. Work with vi editor.
8. Work with joe editor.
9. Windows: Power shell, batch files

V. Metody realizacji i weryfikacji efektów uczenia się

Symbol efektu	Metody dydaktyczne *(lista wyboru)*	Metody weryfikacji *(lista wyboru)*	Sposoby dokumentacji *(lista wyboru)*
WIEDZA			
W_01	Conventional lecture	Exam / Written test	Evaluated test / written test
W_02, W_03, W_04, W_05	Conventional lecture, Guided practice	Exam / Written test, Test of practical skills, Observation	Evaluated test / written test, Rating card / Observation report, Protocol / report printout/ report file
UMIEJĘTNOŚCI			
U_01 - U_10	Laboratory classes, Practical classes	Test of practical skills, Observation	Rating card / Observation report Protocol / report printout/ report file
KOMPETENCJE SPOŁECZNE			
K_01, K_02	Laboratory classes	Exam / Written test, Test of practical skills, Observation	Evaluated test / written test, Rating card / Observation report, Protocol / report printout/ report file
K_03	Laboratory classes	Test of practical skills, Observation	Rating card / Observation report,

			Protocol / report printout/ report file

VI. Kryteria oceny, wagi…

The condition for passing the classes is the student's presence, executing laboratory works and obtaining grades, getting a positive assessment for the answers to the control questions in each laboratory work.

The final grade for the classes is formed as the laboratory work execution results - 70%, the presence - 30%.

The exam (for those who passed the exercises) consists in conducting a test of the knowledge provided during the lecture. The exam grade is formed on the basis of two components:

70 % - written answers to test tasks and oral answers in case of doubt,
30% - the grade obtained from the exercises.

A grading scale is given below:

Less than 50% - unsatisfactory (2.0).

Detailed assessment rules are given to students with each subject edition.

VII. Obciążenie pracą studenta

Forma aktywności studenta	Liczba godzin
Liczba godzin kontaktowych z nauczycielem	**60**
Liczba godzin indywidualnej pracy studenta	**50**

VIII. Literatura

Literatura podstawowa
1. Andrew S. Tanenbaum: Systemy operacyjne. Wydanie III. Helion, 2010. 2. William Stallings: Systemy operacyjne. Struktura i zasady budowy. WNT, Warszawa 2006 3. Shechovtsov V. Operating systems : Textbook for high-school students. BHV, 2005. 4. Abraham Silberschatz, Peter B. Galvin, Greg Gagne: Podstawy systemów operacyjnych. WNT, Warszawa 2006
Literatura uzupełniająca
1. M.J. Bach: Budowa systemu operacyjnego Unix, WNT, Warszawa 1994 2. T.W. Ogletree: Windows XP PL. Księga eksperta, Helion, Gliwice 2002 3. U. Vahalia: Jądro systemu Unix, WNT, Warszawa 2000 4. D.A. Solomon: Inside Windows NT, Microsoft Press, 1998 5. B. Goodheart, J. Cox: Sekrety magicznego ogrodu. UNIX® System V Wersja 4 od środka. WNT, Warszawa 2001. 6. U. Vahalia: Jądro systemu UNIX®. Nowe horyzonty. WNT, W-wa, 2001. 7. D. A. Solomon, M. E. Russinovich: Microsoft Windows® 2000 od środka, Helion, 2003. 8. R. Lowe: Kernel Linux. Przewodnik programisty, Helion, 2004