AGH UNIVERSITY OF SCIENCE AND TECHNOLOGY

Nazwa modułu: Operating Systems

Rok akademicki: 2014/2015 Kod: IES-1-407-s Punkty ECTS: 5

Wydział: Informatyki, Elektroniki i Telekomunikacji

Kierunek: Electronics and Telecommunications Specjalność: —

Poziom studiów: Studia I stopnia Forma i tryb studiów: Stacjonarne

Język wykładowy: Angielski Profil kształcenia: Ogólnoakademicki (A) Semestr: 4

Strona www: —

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Osoby prowadzące: dr inż. Chodorek Robert (chodorek@agh.edu.pl)

Opis efektów kształcenia dla modułu zajęć

Kod EKM	Student, który zaliczył moduł zajęć wie/umie/potrafi	Powiązania z EKK	Sposób weryfikacji efektów kształcenia (forma zaliczeń)
Wiedza			
M_W001	Possesses the ordered knowledge of operating systems necessary to install, operate and maintenance of computer systems	ES1A_W06	Kolokwium
M_W002	Has the structured knowledge of internal structures and mechanisms for the exchange information in operating systems	ES1A_W09	Kolokwium
M_W003	Has the structured knowledge of mechanisms of computer networks and operating systems security	ES1A_W10	Kolokwium
Umiejętności			
M_U001	Is able to use the known methods of configuration and diagnostics of operating systems	ES1A_U23	Kolokwium
M_U002	Is able to configure operating systems to solve simple tasks for engineering, and select and apply appropriate methods and tools	ES1A_U27	Kolokwium
Kompetencje społeczne			
M_K001	Is aware of the responsibility for their own work willingness to comply with the principles of working in a team and bearing responsibility for cooperative task	ES1A_K04	Kolokwium

Matryca efektów kształcenia w odniesieniu do form zajęć

Kod EKM	Student, który zaliczył moduł zajęć wie/umie/potrafi	Forma zajęć										
		Wykład	Ćwiczenia audytoryjne	Ćwiczenia laboratoryjne	Ćwiczenia projektowe	Konwersatorium	Zajęcia seminaryjne	Zajęcia praktyczne	Zajęcia terenowe	Zajęcia warsztatowe	Inne	E-learning
Wiedza												
M_W001	Possesses the ordered knowledge of operating systems necessary to install, operate and maintenance of computer systems	+	-	-	-	-	-	-	-	-	-	-
M_W002	Has the structured knowledge of internal structures and mechanisms for the exchange information in operating systems	+	-	-	-	-	-	-	-	-	-	-
M_W003	Has the structured knowledge of mechanisms of computer networks and operating systems security	+	-	-	-	-	-	-	-	-	-	-
Umiejętności												
M_U001	Is able to use the known methods of configuration and diagnostics of operating systems	-	-	+	-	-	-	-	-	-	-	-
M_U002	Is able to configure operating systems to solve simple tasks for engineering, and select and apply appropriate methods and tools	-	-	+	-	-	-	-	-	-	-	-
Kompetencje społeczne												
M_K001	Is aware of the responsibility for their own work willingness to comply with the principles of working in a team and bearing responsibility for cooperative task	-	-	+	-	-	-	-	-	-	-	-

Treść modułu zajęć (program wykładów i pozostałych zajęć)

Wykład

LECTURES
1. Introduction to Operating Systems and Computer Architecture (4 hours)
The concept of operating system, the hardware layer, the software layer, processes, users, programming languages, basic components of computer system, CPU, I/0, computer memory hierarchy.
2. Secondary Storage (4 hours)
I/O, secondary storage technologies, file system, examples of file systems, disk management, disk partitioning, system call, protection mechanisms, RAID

3. Components of Operating Systems (4 hours)
Services, structures and processes, and threads,
4. Process and Memory Management (6 hours)
Stages of program, the program and the process, CPU scheduling, concurrency and thread dispatching, memory management, memory allocation, segmentation, paging, virtual memory, process synchronization, mutual exclusion, semaphores, shared memory, pipes, message queues, IPC.
5. Networking in Operating System (8 hours)
Computer networks, distributed processing, distributed process management, communication protocols (IP, TCP, UDP, ALC), flow control, congestion control, reliability, socket, transactions, network operating systems, system embedded in the routers.
6. Security of Operating Systems (2 hours)
Authentication, cryptographic mechanisms, trusted systems, buffer overflow an DoS attack.

Ćwiczenia laboratoryjne

LABORATORIES
1. Basic operations in operating systems – part 1.
2. Basic operations in operating systems – part 2.
3. Filesystem – block devices.
4. RAID, LVM.
5. NFS.
6. Written test of classes 1 – 5.
7. Compilation of programs, file operations, environmental variables.
8. Processes and Signals.
9. Named and unnamed pipes.
10. Sockets.
11. Semaphores.
12. Shared memory.
13. Queue messages.
14. Practical colloquium of classes 7 – 13.

Sposób obliczania oceny końcowej

1. In order to obtain a positive grade (FG) is to get a positive assessment of the laboratory.
2. After calculating the average of the all grades GW, where GW is the arithmetic average of all grades received in all terms of written tests and in all practical terms of colloquia. Final Grade FG is calculated by the formula:
if GW >4.75 then FG:=5.0 (bdb) else
if GW >4.25 then FG:=4.5 (ins>db) else
if GW >3.75 then FG:=4.0 (db) else
if GW >3.25 then FG:=3.5 (/ins>dst) else FG:=3 (dst)

Wymagania wstępne i dodatkowe

Information Technology

Zalecana literatura i pomoce naukowe

1. John L. Hennessy and David A. Patterson, Computer Architecture: A Quantitative Approach, 5th edition, 2011
2. Andrew S. Tanenbaum and Albert S. Woodhull, Operating Systems Design and Implementation, 3rd edition, 2006
3. Andrew S. Tanenbaum, Modern Operating Systems, 3rd edition, 2008

4. William Stallings, Computer Organization and Architecture: Designing for Performance, 7th edition, 2006

Publikacje naukowe osób prowadzących zajęcia związane z tematyką modułu
Nie podano dodatkowych publikacji

Informacje dodatkowe
Brak

Nakład pracy studenta (bilans punktów ECTS)

Forma aktywności studenta	Obciążenie studenta
Udział w wykładach	28 godz
Udział w ćwiczeniach laboratoryjnych	28 godz
Samodzielne studiowanie tematyki zajęć	45 godz
Przygotowanie sprawozdania, pracy pisemnej, prezentacji, itp.	24 godz
Sumaryczne obciążenie pracą studenta	125 godz
Punkty ECTS za moduł	5 ECTS