Faculty of Mathematics and Computer Science

Course title: **OPERATING SYSTEMS**

ECTS credit allocation (and other scores): **5**

Semester: spring

Level of study: ISCED-6 - first-cycle programmes (EQF-6)

Branch of science: Natural sciences

Language: English/Polish

Number of hours per semester: 30 lectures + 30 classes = 60 hours

Course coordinator/ Department and e-mail: Erasmus coordinator Anna Szczepkowska/ WMiI, erasmuswmii.uwm.edu.pl

Type of classes: classes and lectures

Substantive content

CLASSES:

Installation and configuration of the operating system (Linux, Windows). Basic system commands: logging, handling files and directories, links, and system help. Process support. Filters, standard streams, pipeline processing. Creating operating system shell scripts. File system support. Examples of file handlers. Process management in the system. Pipeline support. Creating and managing threads.

LECTURES:

Basic concepts: definition, structure, tasks, classification and principle of operation. Process and resource concept. Process states, queues. Threads. Processor scheduling. Main memory management. Memory and address space, division and allocation of memory. Segmentation and paging. Virtual memory. On-demand paging, page exchange algorithms. Input/output devices. Properties and classification, structure of I/O mechanisms. File system - physical layer. File system - logical layer. File system - examples of implementation. Concurrency and process synchronization. Classification of synchronization mechanisms. Deadlock problem.

Learning purpose:

The aim of the course is to present the role and tasks of an operating system in the functioning of a computer and to familiarize with its structure and functioning.

On completion of the study programme the graduate will gain:

Knowledge:

The student has knowledge of the organization and operation of the computer.

The student has knowledge of the principles of operation and the role and importance of the operating system.

Skills:

The student can manage operating systems.

The student can use appropriate tools to manage the operating system.

Social Competencies:

The student understands the need for continuous training.

The student knows the basics of working in a team.

Basic literature:

1. A. Silberschatz, G. Gagne, P.B. Galvin, *Podstawy systemów operacyjnych*, Tom 1, Wyd. Wydawnictwo Naukowe PWN, R. 2021
2. A.S. Tanenbaum, H. Bos, *Systemy operacyjne. Wydanie IV*, Wyd. Helion, R. 2015

Supplementary literature:

1. A. Silberschatz, G. Gagne, P.B. Galvin, *Podstawy systemów operacyjnych*, Tom 2, Wyd. Wydawnictwo Naukowe PWN, R. 2021
2. Ł. Sosna, *Linux. Komendy i polecenia. Wydanie VI*, Wyd. Helion, R. 2022
3. C. Negus, *Linux. Biblia. Wydanie X*, Wyd. Helion, R. 2021
4. R. Love, *Linux. Programowanie systemowe. Wydanie II*, Wyd. Helion, R. 2014
5. Brian Ward, *Jak działa Linux. Podręcznik administratora*, Wyd. Helion, R. 2022

The allocated number of ECTS points consists of:

Contact hours with an academic teacher: 2.6 ECTS points

Student's independent work: 2.4 ECTS points