OPERATING SYSTEMS

Course Workload		Assessment form (examination/ graded test/ ungraded test)
ECTS	Hours	
3	108	Oral exam

The course covers the main concepts of modern operating systems, its main subsystems, and key theoretical problems in this field, including:

- the main goals of operating systems;
- their interactions with devices in low level;
- theoretical issues of operating systems;
- main operating system mechanisms.

Course structure:

1. MODERN CONCEPTS AND TECHNOLOGIES FOR DESIGNING OPERATING SYSTEMS
    1.1. Goals and objectives of the course.
    1.2. Evolution of operating systems.
    1.3. Types of operating systems.
    1.4. Subject and tasks to be solved using operating systems.
    1.5. Functions of operating systems.
    1.6. Layered OS structure.
    1.7. Concept of microkernel operating system architecture.
    1.8. Multiprogramming.
    1.9. Concept of process and flow.
    1.10. Algorithms for scheduling processes and threads.
    1.11. System calls.

2. THE MAIN SUBSYSTEMS OF MODERN OPERATING SYSTEMS
    2.1. OS memory management functions.
    2.2. Memory allocation algorithms.
    2.3. Virtual memory.
    2.4. Data caching.
    2.5. Tasks of the OS to manage files and devices.
    2.6. Support for file systems.
    2.7. Logical organization of the file system.
    2.8. Physical organization of the file system.
    2.9. Implementation of the protocol stack in the OS.

2.10. Features of the implementation of the TCP / IP protocol stack in various operating systems.
2.11. Basic security concepts applicable to the operation of operating systems.
2.12. Technologies for building secure data exchange.
2.13. Authentication technologies.
2.14. Security mechanisms in various operating systems.