Study programmes: Bachelor studies - Mathematics

Course name: RM14 - Operating systems

Lecturers: Miroslav Marić and other lecturers from the Department of Computer Science and Informatics

Status: Compulsory

ECTS: 5

Attendance prerequisites: RM03

Course aims: Acquisition of general and specific knowledge of the theory of operating systems and the principles of their operation.

Course outcome: Student has knowledge of algorithms, policies and principles of the execution of operating systems and of resource management.

Course content:

- Introduction to operating systems: basic concepts; historical overview.
- Operating system design and architecture: monolith, micro and hybrid kernels.
- Process management: concurrency, process states and state diagrams; operating system structures (process control block, queues, etc.); processes and threads; schedulers and context switching; interrupt handling.
- Deadlocks: prevention, avoidance and detection; recovery: models and policies.
- Memory management: physical memory and memory management hardware; overlays, swapping, partitioning; paging and segmentation; algorithms for page swapping.
- IO management: properties of parallel and serial devices; buffering; direct memory access; recovery from errors.
- File Systems: basic concepts; directory and disk structure; file system implementation; special purpose file systems
- Protection and security.

Literature:

1. Abraham Silberschatz, Peter Baer Galvin, Greg Gagne, Operating Systems Concepts, Wiley, 9th Edition.
2. Raphael A. Finkel, An Operating Systems Vade Mecum, Prentice Hall, 2nd Edition.
3. Andrew S. Tanenbaum, Modern Operating Systems 3rd Edition.
4. Marić M., Operativni sistemi, Univerzitet u Beogradu – Matematički fakultet, 2. izdanje
(The lecturer can choose any other appropriate literature)

Number of hours: 4	**Lectures: 2**	**Tutorials: 2**	**Laboratory: -**	**Research: -**

Teaching and learning methods: Frontal, interactive, individual and exercises.

Assessment (maximal 100 points)

Course assignments	**points**	**Final exam**	**points**
Lectures	-	Written exam	70
Exercises / Tutorials	-	Oral exam	-
Colloquia	30	Written-oral exam	-
Essay / Project	-		