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| Study program: Modern computer technologies | | | |
| Course title: Operating Systems | | | |
| Professor/assistant: Mirko Kosanovic / Slavimir Stosovic | | | |
| Type of course: compulsory | | | |
| ECTS credits: 7 | | | |
| Pre-requisites: none | | | |
| Aims of the course: Acquisition of basic knowledge about the structure and functions of the operating system. | | | |
| Learning outcomes: Students learn to install, configure and manage the operating system. | | | |
| Syllabus | | | |
| <u>Theoretical part</u> The basic concept of the operating system and its historical development. The core of the operating system and management processes. Scheduling process and processor time allocation. Synchronization process (concept of semaphores, monitors). Deadlock, its detection and recovery. Memory management. Virtual memory (paging, segmentation). Secondary and tertiary memory. Managing input/output operations. File management. System operation layer for file management. Privacy and security of operating systems. Network and distributed operating systems. The built-in (embedded) operating systems. | | | |
| <u>Practical part :</u> The criteria for determining the efficiency of the operating system. Software implementation of the critical areas. Dekker's and Petersen's algorithm. Hardware implementation of critical areas and implementation through system calls (producer/consumer problem). Classical problems of synchronization: problem philosophers who eat, readers and writers, the sleeping barber, different algorithms used by the dispatcher during the distribution process processor. Examples: banking algorithms and problems related to the detection and elimination of downtime. Algorithms for memory allocation, relocation, paging and segmenting, solutions to various problems related to the allocation of virtual memory using various algorithms. Methods to access files and troubleshoot problems that occur. Algorithms for scheduling requests for the allocation of secondary memory (hard disk) and problems related to RAID structures. The allocation of space for files and different systems of organization (FAT16, FAT32, NTFS). Administering the system files on Windows and Linux operating systems. Privacy and security of operating systems - problems related to authentication and data encryption. | | | |
| Literature | | | |
| 1. B. Đorđević, D. Pleskonjić, N. Maček, <i>Operativni sistemi – koncepti</i> , Mikro knjiga, 2005. | | | |
| 2. W. Stallings, <i>Operativni sistemi</i> , prevod petog izdanja, CET, 2007. | | | |
| 3. A. Tanenbaum, <i>Modern Operating Systems 3rd Ed</i> , Prentice Hall, 2008. | | | |
| 4. A. Silberschatz, P. Galvin, G. Gagne, <i>Operating System Concepts, 7th ed.</i> , John Wiley and Sons, 2005. | | | |
| Number of active classes | | | Other forms of teaching: |
| Lectures: 30 | Practical classes: 60 | Research work: | |
| Teaching methods Combination of interactive approach with practical problem solving. | | | |
| Grading system (maximum 100 points), grading scale from 5 to 10: below 51 points grade 5, grade 6 from 51-60 points, grade 7 from 61-70 points, grade 8 from 71-80 points, grade 9 from 81-90 points, grade 10 from 91-100 points. | | | |
| Pre-exam obligations | points | Final exam | points |
| activity during theoretical lectures | 10 | written exam | 15 |
| practical training | 20 | oral exam | 15 |
| colloquium(s)/seminar papers | 40 | | |
| Sum | 70 | Sum | 30 |