



Academia de Studii Economice
Departamentul de Informatică și Cibernetică Economică

Calea Dorobanți, 15-17, Sector 1, București, 010552 (camera 2314)

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Contest Topics for Associate Professor
Position 53, 2020-2021, semester 2

Topics: Operating Systems, Information Technology Basics

Operating systems

1. Operating systems: definition, role, functions. Types of operating systems.
2. Techniques for operating computer systems: Monoprogramming, Multiprogramming.
3. Techniques for operating computer systems: SPOOL-ing technique, Time sharing, Multiprocessing.
4. Management of processes and processors: concurrent and parallel processes, algorithms for planning the execution of processes, interaction and collaboration of parallel processes, interlocking of processes.
5. Windows operating system. The connection between the INTEL architecture and Windows systems. Implementing virtual memory in Windows.
6. Memory protection. Operating system protection. Device protection.
7. Virtual machines. Multitasking models. API support. Dynamic binding. Message queues.
8. The init process. Process monitoring. The ps, kill and who commands. UNIX daemons.
9. Expanding variables. Replacing orders. Transfer parameters to UNIX commands. UNIX disk partitions. File permissions. Manipulating the contents of a file (sort, head, and tail commands)
10. Working with UNIX commands (syntax, options, arguments). Shell's internal commands. Analysis of a shell command line. Redirects and pipelines.
11. Organizing directories and files in UNIX systems. UNIX file types. UNIX security system. Shell (features and environment).
12. UNIX operating system. UNIX operating system structure. UNIX kernel role and components. UNIX file system management.
13. Operating system user interface. The concept of interruption. Types of interruptions. Interruption treatment. The concept of interruption at P.C.
14. Memory management. The concept of virtual memory. Memory organization algorithms. Ways of organizing memory. Management of peripheral devices. Checkpoints. Communication channels. Input / output processes.

Bibliography:

1. Vasilescu A., Zota Răzvan, Timofte Carmen, Sisteme de operare UNIX și Windows, ASE, 2006
2. Vasilescu A., Dodescu Gh., Oancea B., Sisteme de operare UNIX și Windows, Editura Economică, 2003
3. Vasilescu A., Dodescu Gh., Sisteme de operare UNIX și Windows, ASE, 2001
4. Vasilescu A., Administrarea sistemelor UNIX, Editura Economică, 2008
5. Tanenbaum Andrew, Sisteme de operare moderne, Prentice Hall, 2001



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6. Zota Razvan, Vasilescu Adrian, Unix si Windows, ASE, 2015, România
 7. Vasilescu A., Zota Răzvan, Timofte Carmen , Sisteme de operare UNIX și Windows, ASE, 2006
 8. Dorobăț Iuliana, Sistemul de operare UNIX Teste Grilă, ASE, 2011, România
- Zota Razvan, Vasilescu Adrian, Sisteme de operare Unix si Windows, ASE, 2015, România

Information Technology Basics

1. The basic functions and facilities of a computer
2. Hardware and software - the interdependence between them
3. The concept of control of a program stored in memory - general-purpose computing machines
4. Compilers, assemblers, link-editors and interpreters
5. Client-server computing - how the "network" works
6. Basics of information theory and coding
7. Informational Entropy
8. Information transmission systems
9. Coding of information
10. Numeric and alphanumeric codes
11. Error detection / correction codes
12. Encoding numerical information in a computer
13. Ways of data representation and coding
14. Applications of Boolean algebra to computational systems
15. The general architecture of a microprocessor
16. Flags registers
17. Memory hierarchy
18. Types of memory
19. Virtual memory
20. Algorithms used to exchange pages
21. Virtual machines
22. Address translation - MMU
23. How to organize a virtual machine
24. Introduction to parallel processing

Bibliography:

1. Fl. Nastase, R. Zota , Bazele Tehnologiei Informatiei, ASE, 2013
2. Williams R., Computer Systems Architecture, Addison Wesley, 2010.
3. Fl. Nastase, R. Zota , Bazele Tehnologiei Informatiei, ASE, 2007.



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4. R. Zota, Sisteme de calcul si operare, ASE, 2003.
5. R. Zota, Elemente de arhitectura a sistemelor de calcul si operare, ASE, 2004.
6. Williams R., Computer Systems Architecture, Addison Wesley, 2006.

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