

OPERATING SYSTEMS AND DISTRIBUTED SYSTEMS

Code: 322107

Main Scientific Area: Computer networks and architecture

Lecturer: Miguel ângelo da Silva Pereira

Language of Instruction: Portuguese

Regime: S2

Contact Hours: 60h Total Workload: 108h

ECTS: 6,0

Objectives

Contextualize students with the concept of Operating System, as well as its main functions, user interface and efficient resource management.

To achieve this objective, the main components of an operating system and their interaction with hardware and application software will be studied. For practical demonstration of the concepts, the Linux operating system and/or the Windows 10 operating system will be used.

Learning Outcomes

- Understand the operating system role as a middleware between hardware and software as a resource manager for correct operation of the machine;
- Identify the main management functions of the operating system;
- Understand and practice how to use the interfaces in text and graphic mode for the user;
- Install a new operating system on an empty machine;
- Use a virtual machine to run a second OS;
- Use an user interface to launch and monitor of processes;
- Manage users, groups, shares and permissions of objects.

Course Contents

Introduction to Operating Systems

Function

Classification and organization of an S.O.

Historical evolution of S.O.s

Virtual Machines

Operating Systems installation process

Command interpreter and text/graphical user interface

Process and Memory Management

Process definition Process Scheduling

Memory management mechanisms Virtual Memory: Segmentation and paging

File Management

File system organization and structure

Authorization and access control: File permissions

System calls to access files

Communication between Processes

Process creation Memory sharing / message exchange

Distributed systems

Introduction to distributed systems: Transparency, concurrency, security, scalability and fault tolerance.

Distributed system architectures and models: client-server model, inter-process communication and remote invocation.

Distributed file sharing (in Windows and Linux environments).

Recommended Bibliography

Marques, J.A. , Ferreira P., Ribeiro C., Veiga L., Rodrigues R. (2018). Sistemas Operativos. FCA – Editora de Informática Lda.

Learning and Teaching Methods

The syllabus contents of this curricular unit address the main concepts of Operating Systems area, as well as in the Distributed Systems area. The concepts introduced in this discipline together with their practical application, allow students to understand in a consolidated way the main characteristics of the systems functioning, so that they can be used more effectively, which are the main objectives of the curricular unit.

Assessment Methods

Two theoretical exams, with a minimum assessment of 8/20.