Course guide
340382 - ADSO-I5O01 - Operating Systems Administration

Last modified: 17/05/2023

Unit in charge: Vilanova i la Geltrú School of Engineering
Teaching unit: 701 - DAC - Department of Computer Architecture.

Degree: BACHELOR'S DEGREE IN INFORMATICS ENGINEERING (Syllabus 2018). (Compulsory subject).

Academic year: 2023 **ECTS Credits:** 6.0 **Languages:** Catalan, Spanish

LECTURER

Coordinating lecturer: Sergi Sánchez López

Others:

PRIOR SKILLS

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REQUIREMENTS

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DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:
3. CETI2. Ability to select, design, develop, integrate, value, construct, tmanage, exploit and maintain technologies of machines, programming and nets, keeping suitable costs and quality parameters.
4. CETI3. Ability to set up methodologies focused on user and development organization, valuation and application management and systems based on information technologies which secure ergonomic accessibility and use of
5. CETI5. Ability to select, to develop, integrate and manage information systems which satisfy organization necessities with indentified costs and quality criteria.

Transversal:
1. EFFICIENT ORAL AND WRITTEN COMMUNICATION - Level 1. Planning oral communication, answering questions properly and writing straightforward texts that are spelt correctly and are grammatically coherent.
2. EFFECTIVE USE OF INFORMATI0N RESOURCES - Level 1. Identifying information needs. Using collections, premises and services that are available for designing and executing simple searches that are suited to the topic.

TEACHING METHODOLOGY

Classes will be held using the means available in the classroom (blackboard , multimedia equipment) and those provided by the students themselves (laptop) and will be based on the learning project. The class will be organized in teams of 5-6 students who ,applying agile methodologies , develop a project throughout the course . The objectives of this project will be directly related with the contents of the subject . To work as a team, class attendance is COMPULSORY. A portion of the mark will be the defense, by each team , the objectives achieved at each moment , and teamwork . The other part of the mark will be based on the realization of individual exam , partial and final.

LEARNING OBJECTIVES OF THE SUBJECT

1. Knowledge about the system administrator, with his/her responsibilities and tasks.
2. Plan the basic installation of the systems in an organization.
3. Learn to prepare an installation of the operating system, perform the installation, and the post-installation.
6. Learn to install, maintain, and manage applications for the organization.

4. Manage user accounts, add users, modify users, get information on users, deactivate users, and remove users.
5. Use and modify the permissions and protection mechanims offered by the operating systems on devices and files.
7. Learn to monitor the operating system, users, resources, and applications.
8. Learn to maintain the resources and the file system in a good condition, and to perform backups.
9. Manage the system services, and periodic tasks
10. Learn to configure the main Internet services.
11. Configure, verify and maintain the security of the installation.

STUDY LOAD

Type	Hours	Percentage
Hours small group	15,0	10.00
Self study	90,0	60.00
Hours large group	45,0	30.00

Total learning time: 150 h

CONTENTS

Presentation

Description:
0.1 Information ADSO
0.2 teachers
0.3 Course objectives
0.4 Teaching methods
0.5 evaluation
0.6 Agenda
0.7 Planning of the semester

Full-or-part-time: 1h
Theory classes: 1h

Introduction

Description:
1.1. definitions
1.2 Parts Operating System
1.3 System Administrator Tasks
1.4 Skill level
1.5 Administrator ethical code

Full-or-part-time: 8h
Theory classes: 1h
Laboratory classes: 1h
Self study : 6h

Installation of the operating system

Description:
2.1 Lifecycle of a system
2.2 Prerequisite Tasks: information and planning
2.3 Physical Structure of a disc
2.4 Partitions: concept and justification
2.5 Structure of the file system (UNIX and Windows)
2.6 swap area
2.7 Creating the filesystem
2.8 System Load
2.9 Basic System Configuration
2.10 Starting the system
2.11 System Shutdown

Related activities:
Activity 1: Problems installing an operating system
Lab: Installing an operating system

Full-or-part-time: 17h
Theory classes: 2h
Practical classes: 6h
Laboratory classes: 1h
Self study : 8h

User Management

Description:
3.1 The user as a protection domain
3.2 System Databases
3.3 Basic Commands
3.4 Deactivating and deleting users
3.5 Users and Processes
3.6 permissions and protections
3.7 Users and special groups
3.8 User Management Policies

Related activities:
Activity 1: user management exercicies
Activity 2: User Management Laboratory
Activity 3: complementary Work about user management

Full-or-part-time: 16h
Theory classes: 1h
Practical classes: 4h
Laboratory classes: 1h
Guided activities: 2h
Self study : 8h

Application Management

Description:
4.1 Installing applications
4.2 Versioning
4.3 Installing from source code

Related activities:
Activity 1: Application Management Exercises
Activity 2: Application management Laboratory
Activity 3: scripts Programming Laboratory

Full-or-part-time: 12h
Theory classes: 1h
Practical classes: 2h
Laboratory classes: 1h
Self study : 8h

Monitoring

Description:
5.1 Objectives
5.2 Justification
5.3 Components for monitoring
5.3.1 CPU
5.3.2 Memory
5.3.3 Disk
5.3.4 Network
5.3.5 Users
5.4 Processes
5.4.1 Process Management
5.4.2 Communication between processes

Related activities:
Activity 1: system monitoring exercises

Full-or-part-time: 10h
Theory classes: 1h
Laboratory classes: 1h
Self study : 8h

File System Maintenance

Description:
6.1 Internal organization filesystem
6.2 Owners and protections
6.3 File System Integrity
6.4 Backups

Related activities:
Activity 1: filesystem Exercises
Activity 2: Laboratory of timing
Activity 3: filesystem complementary work

Full-or-part-time: 17h
Theory classes: 2h
Practical classes: 4h
Laboratory classes: 1h
Guided activities: 2h
Self study : 8h

Local Services management

Description:
7.1 Objectives
7.2 Task Timing
7.3 Print Services

Related activities:
Activity 1: Local services lab

Full-or-part-time: 10h
Theory classes: 1h
Laboratory classes: 1h
Self study : 8h

Network services management

Description:
10.1 Transportation
10.2 Protocols
10.3. Networks and hosts
10.4 Address Management
10.5 ports
10.6 Firewalls
10.7 Server and Superserver
10.8 RPC
10.9 DNS, DHCP, HTTP, FTP, SMTP, POP, IMAP, SSH, NFS, SMB, LDAP, VPN

Related activities:
Activity 1: Network services exercises
Activity 2: DNS lab

Full-or-part-time: 10h
Theory classes: 1h
Practical classes: 2h
Laboratory classes: 1h
Self study : 6h

Protction and Security

Description:
11.1. goals
11.2. definition
11.3. Default security
11.4. Security and Usability
11.5. Safety Components
11.6. physical security
11.7. Local Security
11.8. Network Security

Related activities:
Activity 1: protection and security exercises
Activity 2: backup lab

Full-or-part-time: 14h
Theory classes: 1h
Practical classes: 4h
Laboratory classes: 1h
Self study : 8h

Virtualitation

Description:
9.1. Habits and customs
9.2. Emulation and simulation
9.3. Virtualization and operating system
9.4. Xen
9.5. kvm

Related activities:
Activity 1: virtualization exercises
Activity 2: virtualization lab

Full-or-part-time: 13h
Theory classes: 1h
Practical classes: 2h
Laboratory classes: 2h
Self study : 8h

GRADING SYSTEM

mid-term exam*0,3 + project*0,2+ Final exam*0,5+ tests*0,1 >= 5

Revaluation: exam

EXAMINATION RULES.

To obtain the project mark and tests, the class attendance is compulsory

BIBLIOGRAPHY

Basic:
- Adelstein, Tom. Linux system administration [on line]. Farnham: O'Reilly, 2007 [Consultation: 14/02/2024]. Available on: https://ebookcentral-proquest-com.recursos.biblioteca.upc.edu/lib/upcatalunya-ebooks/detail.action?pq-origsite=primo&docID=540432. ISBN 9780596009526.
- Nemeth, Evi ; Snyder, Garth ; Hein, Trent R. ; Whaley, Ben ; Macking, Dan. UNIX and Linux system administration handbook. 5th ed. Boston: Prentice Hall, 2018. ISBN 9780134277554.

Complementary:
- Siever, Ellen [et al]. Linux in a nutshell : a desktop quick reference. 6th ed. Cambridge: O'Reilly, 2009. ISBN 9780596154486.