Degree competences to which the subject contributes

Specific:
1. CET1. 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.
4. Manage user accounts, add users, modify users, get information on users, deactivate users, and remove users.
5. CET5. Learn to install, maintain, and manage applications for the organization.

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 INFORMATION 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.
4. Learn to install, maintain, and manage applications for the organization.
5. Manage user accounts, add users, modify users, get information on users, deactivate users, and remove users.
5. Use and modify the permissions and protection mechanisms 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.

<table>
<thead>
<tr>
<th>Study load</th>
<th>Hours large group:</th>
<th>Hours medium group:</th>
<th>Hours small group:</th>
<th>Guided activities:</th>
<th>Self study:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total learning time:</strong> 150h</td>
<td>45h</td>
<td>0h</td>
<td>15h</td>
<td>0h</td>
<td>90h</td>
</tr>
</tbody>
</table>

Total learning time: 150h

Hours large group: 45h (30.00%)

Hours medium group: 0h (0.00%)

Hours small group: 15h (10.00%)

Guided activities: 0h (0.00%)

Self study: 90h (60.00%)
# Content

## Presentation

<table>
<thead>
<tr>
<th>Description</th>
<th>Learning time: 1h</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Theory classes: 1h</td>
</tr>
</tbody>
</table>

## Introduction

<table>
<thead>
<tr>
<th>Description</th>
<th>Learning time: 8h</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Theory classes: 1h</td>
</tr>
<tr>
<td></td>
<td>Laboratory classes: 1h</td>
</tr>
<tr>
<td></td>
<td>Self study: 6h</td>
</tr>
</tbody>
</table>

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### 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

---

### 1.1 definitions

### 1.2 Parts Operating System

### 1.3 System Administrator Tasks

### 1.4 Skill level

### 1.5 Administrator ethical code
### Installation of the operating system

<table>
<thead>
<tr>
<th>Description:</th>
<th>Learning time: 17h</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1 Lifecycle of a system</td>
<td>Theory classes: 2h</td>
</tr>
<tr>
<td>2.2 Prerequisite Tasks: information and planning</td>
<td>Practical classes: 6h</td>
</tr>
<tr>
<td>2.3 Physical Structure of a disc</td>
<td>Laboratory classes: 1h</td>
</tr>
<tr>
<td>2.4 Partitions: concept and justification</td>
<td>Self study: 8h</td>
</tr>
<tr>
<td>2.5 Structure of the file system (UNIX and Windows)</td>
<td></td>
</tr>
<tr>
<td>2.6 swap area</td>
<td></td>
</tr>
<tr>
<td>2.7 Creating the filesystem</td>
<td></td>
</tr>
<tr>
<td>2.8 System Load</td>
<td></td>
</tr>
<tr>
<td>2.9 Basic System Configuration</td>
<td></td>
</tr>
<tr>
<td>2.10 Starting the system</td>
<td></td>
</tr>
<tr>
<td>2.11 System Shutdown</td>
<td></td>
</tr>
</tbody>
</table>

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

### User Management

<table>
<thead>
<tr>
<th>Description:</th>
<th>Learning time: 16h</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1 The user as a protection domain</td>
<td>Theory classes: 1h</td>
</tr>
<tr>
<td>3.2 System Databases</td>
<td>Practical classes: 4h</td>
</tr>
<tr>
<td>3.3 Basic Commands</td>
<td>Laboratory classes: 1h</td>
</tr>
<tr>
<td>3.4 Deactivating and deleting users</td>
<td>Guided activities: 2h</td>
</tr>
<tr>
<td>3.5 Users and Processes</td>
<td>Self study: 8h</td>
</tr>
<tr>
<td>3.6 permissions and protections</td>
<td></td>
</tr>
<tr>
<td>3.7 Users and special groups</td>
<td></td>
</tr>
<tr>
<td>3.8 User Management Policies</td>
<td></td>
</tr>
</tbody>
</table>

**Related activities:**
- Activity 1: user management exercices
- Activity 2: User Management Laboratory
- Activity 3: complementary Work about user management
### 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

**Learning 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

**Learning 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

**Learning 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

**Learning time:** 10h
- Theory classes: 1h
- Laboratory classes: 1h
- Self study: 8h
### Network services management

**Learning time:** 10h  
- Theory classes: 1h  
- Practical classes: 2h  
- Laboratory classes: 1h  
- Self study: 6h  

**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

### Protection and Security

**Learning time:** 14h  
- Theory classes: 1h  
- Practical classes: 4h  
- Laboratory classes: 1h  
- Self study: 8h

**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
Virtualisation

<table>
<thead>
<tr>
<th>Description:</th>
<th>Learning time: 13h</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.1. Habits and customs</td>
<td>Theory classes: 1h</td>
</tr>
<tr>
<td>9.2. Emulation and simulation</td>
<td>Practical classes: 2h</td>
</tr>
<tr>
<td>9.3. Virtualization and operating system</td>
<td>Laboratory classes: 2h</td>
</tr>
<tr>
<td>9.4. Xen</td>
<td>Self study: 8h</td>
</tr>
<tr>
<td>9.5. kvm</td>
<td></td>
</tr>
</tbody>
</table>

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

Qualification system

mid-term exam*0.3 + project*0.3+ Final exam*0.4 >= 5

Revaluation: project

Regulations for carrying out activities

To obtain the project mark, the class attendance is compulsory

Bibliography

Basic:

Complementary: