

**COURSE DATA****Data Subject**

<b>Code</b>	34897
<b>Name</b>	System administration and maintenance
<b>Cycle</b>	Grade
<b>ECTS Credits</b>	6.0
<b>Academic year</b>	2021 - 2022

**Study (s)**

<b>Degree</b>	<b>Center</b>	<b>Acad. year</b>	<b>Period</b>
1403 - Degree in Telematics Engineering	School of Engineering	4	First term

**Subject-matter**

<b>Degree</b>	<b>Subject-matter</b>	<b>Character</b>
1403 - Degree in Telematics Engineering	16 - Management of systems	Obligatory

**Coordination**

<b>Name</b>	<b>Department</b>
DOMINGO ESTEVE, JUAN DE MATA	240 - Computer Science
PONS SOSPEDRA, SUSANA	240 - Computer Science

**SUMMARY**

All equipment, from small personal computers to large corporate ones, require qualified staff to undertake tasks of installing, managing and maintaining. These tasks should be carried out efficiently and safely, because a failure in them would mean a lack of availability of the equipment/services or even data loss. In the described context, the subject is presented as an overview of the administration and maintenance of systems, so that the student can, not only successfully face the tasks listed above, but also achieve the necessary concepts as to adapt the knowledge acquired to the new requirements that, due to the constant evolution of computing, will be present in future work in the field of computing.

The subject "Management and Maintenance Systems" is taught in the first semester of the fourth year as part of the subject "Systems Administration".



## PREVIOUS KNOWLEDGE

### Relationship to other subjects of the same degree

There are no specified enrollment restrictions with other subjects of the curriculum.

### Other requirements

It is recommended to have previously taken the following subjects: Computing, Computing Extension, Operating Systems, Basic Computer Networks, Computer Network Architecture and Computer Security. The last four subjects are of special relevance, since they deal with concepts of operating systems, computer networks and computer security, which the student is supposed to know already when studying this subject.

## OUTCOMES

### 1403 - Degree in Telematics Engineering

- R1 - Ability for self-learning of new knowledge and techniques appropriate for the conception, development and exploitation of telecommunications systems and services.
- G4 - Ability to solve problems with initiative, decision-making and creativity, and to communicate and transmit knowledge, abilities and skills, understanding the ethical and professional responsibility of the activity of a telecommunications technical engineer.
- E1 - Ability to construct, exploit and manage telecommunication networks, services , processes and applications, understood as systems for the acquisition, transport, representation, processing, storage, management and presentation of multimedia information, from the perspective of telematics services.
- E3 - Ability to construct, operate and manage telematic services using analytical tools for planning, dimensioning and analysis.

## LEARNING OUTCOMES

This subject allows for the following learning outcomes:

- Coordinate with other technical professionals (system administrators, network, database, application, ...) to achieve proper operation of computer systems. (G4,R1)
- Install, configure and maintain common operating systems, including services such as file, print, remote connection or mail. (E1, E3)
- Install, configure and maintain the most common applications, including services such as databases, application servers or web services. (E1, E3)



- Plan and perform the normal duties of system administrators, as user and group management, storage, backup or disaster recovery. (E1, E3)
- Explain the common and specific responsibilities of the various areas of system administration, such as operating systems, networks, databases or web services. (E1, E3)
- Automate some of the tasks of system administration. (E1, E3)

In addition to the above results, this subject also to acquire the following skills and social skills:

- Model and solve problems by being able to identify the essential elements of a situation and make approaches to reduce problems to a manageable level. This includes solutions that are not derived from the application of a standardized procedure, but providing answers original, creative and imaginative.
- Organize, plan and lead their own learning individually and in groups in a coordinated manner.
- Working individually and in groups in a coordinated manner.
- Working in groups: collaboration, leadership, planning, interacting, consensus, negotiation, conflict resolution and respect the opinions of others.
- Argue, defend their opinions and being critical (and self-criticism) from rational and rigorous criteria.
- Drafting and presentation of texts in a clear, coherent, organized and understandable.
- Oral and written comprehension.

## DESCRIPTION OF CONTENTS

### 1. Installation and configuration of operating systems.

Installing operating systems and package manager  
Configuring the operating system boot and system logs.  
Automatic processes in the operating system boot.

### 2. Local storage.

Local storage: Disks, partitions and local filesystems.  
Disk quotas.  
RAID of local disks.

### 3. Network Administration.

Network devices.  
Static configuration of network devices.  
Dynamic configuration of network devices (DHCP).

**4. Remote system access.**

Terminal Network (TELNET).  
Secure Shell (SSH).

**5. Network storage management.**

Network File System (NFS).  
SAMBA.

**6. System network services**

Domain Name Servers (DNS).  
Servidors web servers

**7. Virtualization**

Introduction to virtualization with KVM/QEMU.

**WORKLOAD**

ACTIVITY	Hours	% To be attended
Theory classes	30,00	100
Laboratory practices	20,00	100
Classroom practices	10,00	100
Development of group work	10,00	0
Study and independent work	20,00	0
Readings supplementary material	10,00	0
Preparation of evaluation activities	20,00	0
Preparing lectures	20,00	0
Preparation of practical classes and problem	10,00	0
<b>TOTAL</b>	<b>150,00</b>	

**TEACHING METHODOLOGY**

The training activities are developed according to the following distribution:



- Theoretical activities: topics will be developed providing a global view. Key aspects or those that are more difficult to understand will be analysed in more detail. At all times student participation will be encouraged. (E1, E3)
- Practical activities: these will complement theoretical activities in order to apply the concepts covered in the theory part and increase it with experience. Practical activities comprise both solving exercises and problems in the classroom and laboratory practices as well as programmed tutorials (individual or in group). (G4, E1, E3)
- Student personal work: Students will have to make monographic tasks, do some conducted bibliographic search, questions and problems as well as the preparation of classes and exams. This task will be performed individually. (G4, R1, E1, E3)
- Work in small groups: groups of 2-4 students work will make questions and problems outside the classroom. This work complements the individual work of the student and promotes their integration into working groups. (G4, G6, R5, TI2, SI3)

## EVALUATION

The assessment of the course will comprise two parts, theory and problems assessment and laboratory assesment.

The theory and problems assessment (TP) will consist of two parts:

- Continuous evaluation (EC), based on the participation and involvement of students in the teaching-learning process. This should take into account regular attendance to the planned classroom activities and resolution of the exercises and problems proposed, including individual tests (controls). (G4, R1, E1, E3)
- Exam evaluation (EE), to be held at the end of the semester and will include both theoretical and practical issues. This test should be conducted outside teaching hours within the exam period. (E1, E3)

Both parts will score up to 10 points, calculating the final grade for theory (TP) according to the following formula:

$$TP = 0.3 * EC + 0.7 * EE$$

In the event that a student is unable to attend continuous assessment, his theory final grade will be calculated according to the following formula:

$$TP = EE$$

The impossibility of attending the continuous evaluation must be accredited at the beginning of the classes.



The laboratory evaluation (L) will also consist of two parts:

Laboratory evaluation (L) will also consist of two parts:

- Achievement of objectives in the laboratory sessions (SL), counting all laboratory sessions up to 10 points and obviously not attending a laboratory session scored as 0. The final laboratory sessions grade will be calculated as:

$$SL = \text{MINIMUM} (10, (\text{SUMMATION}(SL_i) - SL_m) / (N-1) + SL_m/10)$$

Where  $SL_i$  is the score of each laboratory session,  $SL_m$  is the minimum score obtained in a laboratory session and  $N$  is the number of laboratory sessions. (G4, R1, E1, E3)

- Evaluation of a exercise performed in the laboratory (EL), which will consist of developing a practical exercise similar to one of the laboratory sessions and which will score from 0 to 10 points. (E1, E3)

The final laboratory grade (L) will be calculated according to the formula:

$$L = 0,3 * SL + 0,7 * EL$$

In the event that a student is unable to attend laboratory sessions, his final laboratory grade will be calculated according to the following formula:

$$L = EL$$

The impossibility of attending the laboratory sessions must be accredited at the beginning of the classes.

The final score for the course will be calculated according to the formula:

$$\text{SCORE} = 0.7 * TP + 0.3 * L$$

The subject will be considered as failed if  $EE < 4,0$  or  $TP < 4,0$  or  $EL < 4,0$  or  $L < 4,0$  or  $\text{SCORE} < 5,0$ .

In the second call, the subject will be assessed as in the first round.

According to the regulations of the University of Valencia, the performance of fraudulent actions in a test or part of it will result in the qualification of a zero in the same, irrespective of the disciplinary procedure that can be opened and of the sanction that is according to the current legislation. In any case, the evaluation of this subject will be done in compliance with the University Regulations in this regard, approved by the Governing Council on 30th May 2017 (ACGUV 108/2017)

## REFERENCES

### Basic

- Linux system administration [Recurs electrònic] / by Tom Adelstein, Bill Lubanovic. Sebastopol, Calif. : O'Reilly, 2007. ISBN: 9780596009526



- Pro Linux System Administration: Learn to Build Systems for Your Business Using Free and Open Source Software / Matotek, Dennis ; Turnbull, James ; Lieverdink, Peter. Berkeley, CA: Apress L. P, 2017

#### **Additional**

- Essential system administration [Recurs electrònic] / AEleen Frisch. Beijing ; Sebastopol, CA : O'Reilly, 2002. ISBN: 0596003439
- Automating Linux and UNIX system administration [Recurs electrònic] / Nate Campi and Kirk Bauer. Berkeley, Calif. : Apress ; New York : Distributed to the book trade by Springer-Verlag, c2009. ISBN: 9781430210597

### **ADDENDUM COVID-19**

**This addendum will only be activated if the health situation requires so and with the prior agreement of the Governing Council**

#### **Contents**

The contents initially included in the teaching guide are maintained.

#### **Workload and temporary teaching planning**

The different activities described in the teaching guide are maintained with the planned dedication.

The material for the follow-up of the classes of theory/practices allows to continue with the professor of temporary planning so much in days as in schedule, so much if the teaching is face-to-face in the classroom or if it is not.

#### **Teaching methodology**

*If it is required by the sanitary situation, the Academic Committee of the Degree will approve the Teaching Model of the Degree and its adaption to each subject, establishing the specific conditions in which it will be developed, taking into account the actual enrolment data and the space availability.*



## **Evaluation**

The evaluation system described in the teaching guide of the subject in which the different evaluable activities have been specified as well as their contribution to the final grade of the subject is maintained.

If there is a closure of the facilities for health reasons that affect the development of any face-to-face evaluable activity of the subject, it will be replaced by a test of a similar nature that will be carried out in virtual mode using the computer tools licensed by the Universitat de València.

The contribution of each evaluable activity to the final grade for the course will remain unchanged, as established in this guide.

*If it is required by the sanitary situation, the Academic Committee of the Degree will approve the Teaching Model of the Degree and its adaption to each subject, establishing the specific conditions in which it will be developed, taking into account the actual enrolment data and the space availability.*

## **Bibliography**

The bibliography recommended in the teaching guide.