VNIVERSITAT DE VALÈNCIA

Course Guide
34682 System administration and maintenance

COURSE DATA

Data Subject	
Code	34682
Name	System administration and maintenance
Cycle	Grade
ECTS Credits	6.0
Academic year	2022 - 2023

Study (s)

Degree	Center	Acad. year	Period
1400 - Degree in Computer Engineering	School of Engineering	4	First term

Subject-matter

Degree	Subject-matter	Character
1400 - Degree in Computer Engineering	14 - Operating systems, distributed systems and networks	Obligatory

Coordination

Name	Department
BONET ESTEBAN, ENRIQUE VICENTE	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.

1400 - Degree in Computer Engineering

- G4 - Ability to define, evaluate and select hardware and software platforms for the development and implementation of computer systems, services and applications, in accordance with both the knowledge and the specific skills acquired in the degree.
- G6 - Ability to design and develop computer systems and centralised or distributed computer architectures which integrate hardware, software and networks, in accordance with both the knowledge and the specific skills acquired in the degree.
- R5 - Knowledge, management and maintenance of computer systems, services and applications.
- TI2 - Ability to select, design, implement, integrate, evaluate, build, manage, exploit and maintain hardware, software and network technologies, within adequate cost and quality thresholds.
- SI3 - Ability to actively participate in the specification, design, implementation and maintenance of information and communication systems.

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, G6)

- Install, configure and maintain common operating systems, including services such as file, print, remote connection or mail. (R5, TI2. SI3)

- Install, configure and maintain the most common applications, including services such as databases, application servers or web services. (R5, TI2. SI3)

- Plan and perform the normal duties of system administrators, as user and group management, storage, backup or disaster recovery. (R5, TI2. SI3)

- Explain the common and specific responsibilities of the various areas of system administration, such as operating systems, networks, databases or web services. (R5, TI2. SI3)

- Automate some of the tasks of system administration. (R5, TI2. SI3)

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).
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
TOTAL	**150,00**	

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. (R5, TI2. SI3)
- 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, G6, R5, TI2, SI3)
- 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, G6, R5, TI2, SI3)
- 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, G6, R5, TI2, SI3)
- 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. (R5, TI2, SI3)

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 = MINIMUM (10, (SUMMATION(SLi)-SLm) / (N-1) + SLm/10)

Where SLi is the score of each laboratory session, SLm is the minimum score obtained in a laboratory session and N is the number of laboratory sessions.G4, G6, R5, TI2, SI3)

- 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. (R5, TI2, SI3)

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 laboratori 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:

SCORE = 0.7 * TP + 0.3 * L

The subject will be considered as failed if EE less than 4,0 or TP less than 4.0 or EL less than 4,0 or L less than 4.0 or SCORE less than 5.0.

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

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).

https://webges.uv.es/uvTaeWeb/MuestraInformacionEdictoPublicoFrontAction.do?accion=inicio&idEdictoSeleccionado=5639.

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] / Nathan Campi and Kirk Bauer. Berkeley, Calif. : Apress ; New York : Distributed to the book trade by Springer-Verlag, c2009. ISBN: 9781430210597