

SUBJECT TEACHING GUIDE

G679 - Design and management of Computer Systems

Degree in Computer Systems Engineering

Academic year 2023-2024

| 1. IDENTIFYING DATA | | | | | |
|----------------------------------|---|------------------|--------------------|------------------|------------------|
| Degree | Degree in Computer Systems Engineering | | | Type and Year | Optional. Year 4 |
| Faculty | Faculty of Sciences | | | | |
| Discipline | Subject Area: Computer Engineering Mention in computer Engineering | | | | |
| Course unit title and code | G679 - Design and management of Computer Systems | | | | |
| Number of ECTS credits allocated | 6 | Term | Semester based (2) | | |
| Web | http://aulavirtual.unican.es/ | | | | |
| Language of instruction | Spanish | English Friendly | No | Mode of delivery | Face-to-face |

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| Department | DPTO. INGENIERÍA INFORMÁTICA Y ELECTRÓNICA |
| Name of lecturer | JOSE ANGEL HERRERO VELASCO |
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| Other lecturers | |

3.1 LEARNING OUTCOMES

- Be able to program and design new operating system services
- Know how to develop the tasks and exercise the responsibilities of a System Administrator for "data center" environments.
- Understand and apply the principles of energy efficiency in the design and operation of a data centre
- Know how to reconfigure and recompile a system kernel, optimizing it according to particular needs
- Understand centralized advanced tools to manage data center systems
- Know the procedures for the integration of computer systems for management environments and global services of data centers
- Learn to configure and manage in an optimal and secure way the basic and advanced network services.
- Understand and know how to deploy a basic environment of high availability and load balancing for a given service, using common tools
- To know the basic techniques of protection and security of which the Operating System consists

4. OBJECTIVES

- This course aims to expand the student's knowledge acquired in the subject of "Computer Systems", giving a deeper and more specialized view of the administration of computer systems:
- To know the basic aspects of the "data center", as far as its organization, design and mechanisms of energy efficiency.
 - To know the basic aspects of the administration of computer systems for environments "data center"; Responsibilities, obligations and good practices
 - Work on the design and INTEGRATION of its main components for the implementation of advanced services in operating systems dedicated to the management of computer resources, distributed storage and network, both in the field of the INTRANET and INTERNET.
 - Analyzing and implementing the main security mechanisms for the "secularization" of the system's basic services.
 - know how to deploy tools and remote mechanisms for monitoring, supervision and management of services and computer systems.

6. SUBJECT PROGRAM

| CONTENTS | |
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| 1 | Fundamentals about "the system administrator": Tasks, responsibilities and DevOps |
| 2 | Active directory secure service: LDAP |
| 3 | Computer systems for deploying 3party NETWORKING services: DHCP, DNS and NTP |
| 4 | Computer systems for deploying network FILE systems and RESOURCE sharing management: NFS and SAMBA |
| 5 | Computer systems for WEB hosting service management: HTTP |
| 6 | Computer systems for electronic MAIL service management: SMTP and IMAP |
| 7 | Configuration managers and Monitoring tools: ANSIBLE, WEBMIN, GANGLIA and NAGIOS |
| 8 | Fundamentals about "Data Centers": Design, supports systems, efficient and rating |

| 7. ASSESSMENT METHODS AND CRITERIA | | | | |
|---|--|-------------|-----------|---------------|
| Description | Type | Final Eval. | Reassessn | % |
| It will consist of 2 exercises (EC1-P and EC2-P), each one consisting of the development of several practical cases to be solved on a virtual computing platform. Approximate duration: 2h. | Activity evaluation with Virtual Media | No | Yes | 60,00 |
| It will consist of 2 theory exercises (EC1-T and EC2-T), each one consisting of a quiz with short answer questions on theoretical concepts seen in class. Approximate duration of each questionnaire: 45". | Activity evaluation with Virtual Media | No | Yes | 40,00 |
| It consists of 2 parts: - THEORY QUESTIONNAIRE: Set of short answer questions on the theoretical units. Its duration will be about 45 minutes and WITHOUT aids. Its weight on the final grade of the EF will be 40%. - PRACTICAL EXERCISE: Development of seve | Activity evaluation with Virtual Media | Yes | No | 0,00 |
| TOTAL | | | | 100,00 |
| Observations | | | | |
| <p>The evaluation of this course will be carried out by means of continuous evaluation, through 2 RECOVERABLE partial exams (EC1 and EC2), each one with its corresponding load of theoretical part (40%) and practical laboratory part (60%). The theoretical part will be done through a written test and the practical part using a virtual computing environment similar to the one used in the laboratory classes.</p> <p>The weight of each partial exam on the final EC grade will be 50%.</p> <p>Students who obtain a grade equal to or higher than 5 in each part of the continuous evaluation exams will eliminate that content for the final exam. Students who fail may recover it in the final exams (EF). Any case, all the content can be recovered in the EF of the extraordinary call.</p> <p>The format and structure for the final exam (FE), both of the ordinary and extra-ordinary call, will be similar to the partial exams of continuous evaluation (CE).</p> | | | | |
| Observations for part-time students | | | | |
| Part-time enrolled students are subject to the same evaluation system as the rest of the students. If they are unable to attend the partial exams held throughout the course, they must take the final exams (EF). | | | | |

| 8. BIBLIOGRAPHY AND TEACHING MATERIALS |
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| BASIC |
| UNIX & LINUX Administration Handbook Autor: Evi Nemeth, et al. Editorial: Prentice Hall, (5th Edition) (2018) ISBN: 978-0-13-427755-4 |

