

SUBJECT TEACHING GUIDE

G679 - Design and management of Computer Systems

Degree in Computer Systems Engineering

Academic year 2017-2018

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

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

3.1 LEARNING OUTCOMES
- Knowing how to perform the tasks and the responsibilities involved in the Systems Administrator work in "data center" context.
- Understand and apply the principles of energy efficiency in the design and operation of a data center.
- Know the integration procedures of computer systems for management environments and global services
- Being able to plan and design new operating system services.
- Understand centralized advanced tools to manage data center systems
- Know, configure and manage optimally and safely basic and advanced network services.
- Knowing the basics of security and protection that comprise the operating system.

4. OBJECTIVES

This course aims to broaden the student's knowledge acquired in the subject of "Information Systems", giving a deeper and specialized operating systems management vision.

On the Basics of Management Information Systems:

1. Know the generalities in the organizational and human structure of a computing environment "data center"
2. Define System Administrator for advanced computing environment
 - to.
 - a. Obligations and responsibilities in a Data Centre
 - b. Knowledge and skills
 - c. Good practices
 - d. Levels of training
3. Know the resources and sources of relevant information for the system administrator

• On the Advanced Management Information Systems:

Gain knowledge in advanced management for installation, configuration and management (integration) of the following systems and most prominent computer services management environments:

1. Integration of global service management environments I: INTRANET
 - to. computer systems for information management and validation
 - secure Active Directory Service (LDAP) OpenLDAP and TLS / SSL
 - Mechanisms directory integration: NSS, PAM (SSS)
 - b. computer systems for management support services
 - Dynamic Service Network Configuration (DHCP): ISC DHCP
 - Local service name resolution (DNS): DNS ISC bind9
 - Local Time Synchronization Service (NTP): NTP ISC
 - c. computer systems for network file management and resource sharing and interoperability with MS Windows platforms
 - distributed file service and network (NFS): NFSv4
 - insurance service interoperability with MS System (Windows Servers): SAMBA
2. Integration of global service management environments II: INTERNET
 - to. computer systems for management WEB:
 - Secure Web Service (HTTP): Apache2 HTTP and TLS / SSL
 - Content Management Service (CMS) Wordpress
 - b. computer systems for managing email:
 - Secure Mail Service (SMTP, IMAP): Postfix, DAVECOT and TLS / SSL
 - Service secure access to web mail (Webmail): Roundcube

• On the monitoring and control of servers and services:

Mastering the processes of installation and operation of centralized tools specialized in the monitoring and control of servers and services

1. Server Configuration:
 - to. Webmin (with SSL)
2. Monitoring Servers
 - to. Ganglia and Nagios 3

6. COURSE ORGANIZATION

CONTENTS

1	<p>Unit 1: Introduction to Computer Systems Administration</p> <ol style="list-style-type: none"> 1. Know different patterns of human organization environments "data center" 2. Know skill levels, tasks and responsibilities of the system administrator 3. Know the usual tools and working methods
2	<p>Unit 2: Global services integration for management environments I: INTRANET</p> <ol style="list-style-type: none"> 1. Computer Systems for information management and validation <ol style="list-style-type: none"> to. secure centralized Active Directory (LDAP): OpenLDAP (SSL) b. Directory integration mechanisms: identification and authentication: NSS, PAM and SSS 2. Computer Systems for managing auxiliary services <ol style="list-style-type: none"> to. Service dynamic network configuration (DHCP): ISC DHCP b. Local service name resolution (DNS): ISC Bind9 c. Local Time Synchronization Service (NTP): NTP ISC 3. Computer Systems for network file management and resource sharing: <ol style="list-style-type: none"> to. Network File Service (NFS): NFSv4 b. secure resource sharing and interoperability with MS System (Windows Servers: SAMBA)
3	<p>Unit 3: Global services integration for management environments I: INTERNET</p> <ol style="list-style-type: none"> 1. Computer Systems for management WEB: <ol style="list-style-type: none"> to. secure Web (HTTP): Apache2 and TLS / SSL b. Content Management Service (CMS) Wordpress 2. Computer Systems for managing email: <ol style="list-style-type: none"> to. secure mail (SMTP, IMAP): Postfix, DAVECOT and TLS / SSL b. Service secure access to web mail (Webmail): RoundCube
4	<p>Unit 4: Centralized monitoring and service configuration tools and servers</p> <ol style="list-style-type: none"> 1. Server Configuration <ol style="list-style-type: none"> to. WEBMIN centralized configuration (SSL) 2. Server Monitoring <ol style="list-style-type: none"> to. Ganglia monitoring and control MONITOR b. Monitoring and control with Nagios 3
5	Final Exam

7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
Evaluación Continua (EC)	Laboratory evaluation	No	Yes	100,00
Examen Recuperacion (ER)	Written exam	Yes	No	0,00
TOTAL				100,00
Observations				
<p>The evaluation will be continuous across the term (EC), with two midterms. The content and weight of the midterms is: EC1: Block 1 and 2, 60% EC2: Block 3 and 4, 40%</p> <p>The course will be pass if the average weighted mark is greater or equal to 5 points.</p>				
Observations for part-time students				
Within the dates provides by the school, the part-time student evaluation will be done through a exam.				

8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC

Linux Administration Handbook (2nd Edition)
 Autor: Evi Nemeth, Garth Snyder, Trent R. Hein
 Editorial: Upper Saddle River, NJ : Prentice Hall, cop. 2007.
 ISBN: 0-13-148004-9

UNIX & LINUX Administration Handbook (3rd Edition)
 Autor: Evi Nemeth,
 Editorial: (Paperback), Prentice Hall, 4RD edition (2010)
 ISBN: 978-0-13-148005-6