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 Engingeering			
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
E-mail	vpuente@unican.es
Office	Facultad de Ciencias. Planta: + 1. DESPACHO (1103)
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	Unit 1: Introduction to Computer Systems Administration 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	Unit 2: Global services integration for management environments I: INTRANET 1. Computer Systems for information management and validation 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 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: to. Network File Service (NFS): NFSv4 b. secure resource sharing and interoperability with MS System (Windows Servers: SAMBA)
3	Unit 3: Global services integration for management environments I: INTERNET 1. Computer Systems for management WEB: to. secure Web (HTTP): Apache2 and TLS / SSL b. Content Management Service (CMS) Wordpress 2. Computer Systems for managing email: to. secure mail (SMTP, IMAP): Postfix, DAVECOT and TLS / SSL b. Service secure access to web mail (Webmail): RoundCube
4	Unit 4: Centralized monitoring and service configuration tools and servers 1. Server Configuration to. WEBMIN centralized configuration (SSL) 2. Server Monitoring 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

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%

The course will be pass if the average weighted mark is greater or equal to 5 points.

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