



## Teaching Guide

Identifying Data					2023/24
Subject (*)	Operating Systems Administration		Code	614G01047	
Study programme	Grao en Enxeñaría Informática				
Descriptors					
Cycle	Period	Year	Type	Credits	
Graduate	2nd four-month period	Third	Optional	6	
Language	Galician				
Teaching method	Face-to-face				
Prerequisites					
Department	Ciencias da Computación e Tecnoloxías da InformaciónComputación				
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General description	In this course we'll try to get acquainted with the administration of unix-like operating systems. We'll try to cover both the concepts and the different implementations of those same concepts by using systems on the different branches of the unix family tree It is assumed a certain knowledge of basic operating system concepts, basic unix commands and shell programming				

## Study programme competences

Code	Study programme competences
A53	Capacidade para seleccionar, deseñar, despregar, integrar, avaliar, construír, xestionar, explotar e manter as tecnoloxías de hardware, software e redes dentro dos parámetros de custo e calidade adecuados.
A55	Capacidade para seleccionar, deseñar, despregar, integrar e xestionar redes e infraestruturas de comunicacións nunha organización.
B9	Capacidade para xerar novas ideas (creatividade)
C1	Expresarse correctamente, tanto de forma oral coma escrita, nas linguas oficiais da comunidade autónoma.
C2	Dominar a expresión e a comprensión de forma oral e escrita dun idioma estranxeiro.
C3	Utilizar as ferramentas básicas das tecnoloxías da información e as comunicacións (TIC) necesarias para o exercicio da súa profesión e para a aprendizaxe ao longo da súa vida.
C4	Desenvolverse para o exercicio dunha cidadanía aberta, culta, crítica, comprometida, democrática e solidaria, capaz de analizar a realidade, diagnosticar problemas, formular e implantar solucións baseadas no coñecemento e orientadas ao ben común.
C5	Entender a importancia da cultura emprendedora e coñecer os medios ao alcance das persoas emprendedoras.
C6	Valorar criticamente o coñecemento, a tecnoloxía e a información dispoñible para resolver os problemas cos que deben enfrontarse.
C7	Asumir como profesional e cidadán a importancia da aprendizaxe ao longo da vida.
C8	Valorar a importancia que ten a investigación, a innovación e o desenvolvemento tecnolóxico no avance socioeconómico e cultural da sociedade.

## Learning outcomes

Learning outcomes	Study programme competences		
Knowledge of the characteristics, functionalities and structure of operating systems and design and implement applications based on its services.	A53 A55	B9	C1 C2 C3 C4 C5 C6 C7 C8

## Contents



Topic	Sub-topic
Introduction to System Administration	<ul style="list-style-type: none"> <li>The role of the System Administrator</li> <li>Users and groups</li> <li>Files, processes and devices</li> <li>Becoming superuser</li> <li>Basic system administration commands</li> <li>Different UNIXes</li> </ul>
Booting and Installing the Operating System	<ul style="list-style-type: none"> <li>Selecting and preparing installation media</li> <li>The boot process</li> <li>Preparing the disks. Basic disk partitioning</li> <li>Sharing disks among O.S.s</li> <li>Boot loaders</li> </ul>
Basic TCP Networking	<ul style="list-style-type: none"> <li>Basic network configuration</li> <li>Network interface aliasing</li> <li>Manipulating routes</li> <li>inetd configuration: tcpwrappers</li> </ul>
Managing users and groups	<ul style="list-style-type: none"> <li>Managing user accounts</li> <li>Administrative tools for managing users</li> <li>Managing groups</li> <li>User authentication with PAM</li> <li>User authentication with LDAP</li> </ul>
Processes and software packages	<ul style="list-style-type: none"> <li>Managing and monitoring processes</li> <li>Tracing system calls</li> <li>Process privileges and priorities</li> <li>The /proc filesystem</li> <li>Signals</li> <li>Software packages: packages and ports</li> <li>Administering software packages and installing software</li> </ul>
Devices, disks and filesystems	<ul style="list-style-type: none"> <li>Devices and device files.</li> <li>Adding support for devices. Kernel modules</li> <li>Organisation of the UNIX file system.</li> <li>Managing disks. Partitioning schemes</li> <li>Creating and accesing filesystems</li> <li>Managing volumes.</li> <li>RAID</li> <li>Encrypting filesystems</li> <li>Introduction to the ZFS filesystem</li> </ul>
Automating administrative tasks	<ul style="list-style-type: none"> <li>Shell scripting</li> <li>Monitoring system: logs</li> <li>Schedulling execution of tasks: the cron and at commands</li> <li>Starting and stopping system services</li> <li>Initialization files and boot scripts</li> </ul>

## Planning

Methodologies / tests	Competencies	Ordinary class hours	Student?s personal work hours	Total hours
Guest lecture / keynote speech	A53 A55 B9 C1 C2 C3 C4 C5 C6 C7 C8	21	63	84
Laboratory practice	A53 A55 B9 C1 C2 C3 C4 C5 C6 C7 C8	14	28	42



Supervised projects	A53 A55 B9 C1 C2 C3 C4 C5 C6 C7 C8	7	10.5	17.5
Objective test	A53 A55 B9 C1 C2 C3 C4 C5 C6 C7 C8	2.5	0	2.5
Personalized attention		4	0	4
(*)The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.				

Methodologies	
Methodologies	Description
Guest lecture / keynote speech	The teacher will elaborate on the contents and give guidance on how to use and apply these concepts in the laboratory
Laboratory practice	Practical application of the concepts exposed in the magisterial sessions. The students will install several different unix systems (System V, BSD, POSIX ...) on the same virtualized machine, having to coexist the different types of partitions and the different boot loaders and will carry out the different administration tasks of the S.O. on each of the installed systems
Supervised projects	Preparation and exposition in class, by the students, of complementary topics to the syllabus of the subject
Objective test	Written exam to evaluate the degree of assimilation of the concepts exposed in the master sessions

Personalized attention	
Methodologies	Description
Objective test Supervised projects Guest lecture / keynote speech Laboratory practice	An attempt will be made to resolve all doubts and make as many clarifications as necessary in the classroom hours in the different methodologies. In addition, the teacher will be available for personalized attention to students in the tutoring hours reserved for this purpose.  Students have the possibility of reviewing the evaluations obtained in the different sections and being informed of the criteria that have been used for this purpose.

Assessment			
Methodologies	Competencies	Description	Qualification
Objective test	A53 A55 B9 C1 C2 C3 C4 C5 C6 C7 C8	Written exam to assess the degree of assimilation of the concepts exposed in the master sessions	40
Supervised projects	A53 A55 B9 C1 C2 C3 C4 C5 C6 C7 C8	Both their contents as well the expositions in class will be evaluated.  Students not taking part in the class presentations, will perform peer to peer evaluations of the expositions and must prove the acquisition of the basic concepts used in them	20
Laboratory practice	A53 A55 B9 C1 C2 C3 C4 C5 C6 C7 C8	The delivery of the lab assignments in the pre-established deadline will be valued as well as its correct operation. Furthermore, as part of the practice evaluation process, an individual practice test will be carried out, without the use of any additional material, on a machine similar to the ones used during the lab assignments  PART TIME STUDENTS: A meeting will be held at the beginning of the course to assess how the evaluation will be carried out based on its availability	40

Assessment comments

Sources of information



<b>Basic</b>	<ul style="list-style-type: none"><li>- Nemeth, Snyder, Hein ,Whaley (2011). Unix and Linux System Administration Handbook 4th edition . Pearson Education</li><li>- Solaris System Engineers (2009). Solaris 10 System Administration Essentials (Solaris System Administration). : Prentice Hall</li><li>- Frisch, Aeleen (2002). Essential System Administration. O' Reilly</li><li>- The FreeBSD Documentation Project (2012). The FreeBSD handbook. <a href="http://www.freebsd.org/doc/en_US.ISO8859-1/books/handbook/">http://www.freebsd.org/doc/en_US.ISO8859-1/books/handbook/</a></li><li>- openBSD.org (2012). Bug Buster's guide to OpenBSD. <a href="http://www.openbsd.org/faq/index.html">http://www.openbsd.org/faq/index.html</a></li></ul>
<b>Complementary</b>	

## Recommendations

Subjects that it is recommended to have taken before

Subjects that are recommended to be taken simultaneously

Subjects that continue the syllabus

Other comments

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(\*)The teaching guide is the document in which the URV publishes the information about all its courses. It is a public document and cannot be modified. Only in exceptional cases can it be revised by the competent agent or duly revised so that it is in line with current legislation.