



Teaching Guide

| Identifying Data | | | | | 2024/25 |
|---------------------|---|--------|----------------------|-----------|---------|
| 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 / results

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



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

| Planning | | | | |
|--------------------------------|---------------------------------------|--------------------------------------|-------------------------------|-------------|
| Methodologies / tests | Competencies / Results | Teaching hours (in-person & virtual) | 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 / Results | 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 adquisition 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: Part time students unavailable to attend the lab sessions and their peers expositions, will get their scores from the objective test and the lab assignment test. | 40 |

| Assessment comments |
|---------------------|
|---------------------|



Todos os aspectos relacionados con ?dispensa académica?, ?dedicación ao estudo?, ?permanencia? e ? fraude académica? rexeranse de acordo coa normativa académica vixente da UDC

Sources of information

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

Recommendations

Subjects that it is recommended to have taken before

Operating Systems/614G01016

Subjects that are recommended to be taken simultaneously

Integrative Programming/614G01049

Subjects that continue the syllabus

Other comments

(*)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.