Universidad de Huelva

SERVICIO DE LENGUAS MODERNAS

ANEXO II. FICHA de la asignatura

TITLE: FREE SOFTWARE TOOLS FOR SCIENCE
Tutor: Francisco Pérez Bernal

ECTS: 6 Semester

Description

This module will focus on a basic introduction to the Free Software operating system GNU/Linux. Special emphasis is given to the work on the console and to the basic operating system tools from a user's perspective, and to some tools of interest for standard scientific work. The course is divided into three blocks making an intensive use of Moodle in all of them.

In the first block the student is shown how to carry out a basic GNU/Linux install, using preferably an Ubuntu distribution. In the first block the attendance is also introduced to the *bash* shell and basic file management operations. The only administrative tool introduced is *aptitude*, in order to make them able to install scientific applications while keeping the system safely updated.

The second block is an overview of several applications of interest for the everyday work in a scientific and academic environment. For example, applications for text processing (*LaTeX*), data representation (*xmgrace*, *gnuplot*), spreadsheet production (*gnumeric*), office suite (*libreoffice*), and graphic treatment (*inkscape*). Special emphasis will be given to the first two topics.

The third block is devoted to provide the access to tools for numerical and statistical calculations and a first introduction to programming. The student will be introduced to the numerical analysis tool *GNU Octave*, and the statistical suite *GNU R*. Depending on the students' backgrounds and interests, the attention will be focused on one or several topics.

Aims

After this course students are expected to have a basic knowledge of the GNU/Linux operating system from a user's perspective, to have learnt some programming techniques for statistical and numerical calculations, and to have acquaintance with several computing tools and applications of scientific interest. The learning process will be reinforced by the application of the selected tools to particular scientific problems at a basic level.

Learning outcomes

By the end of the module students should be able to:

- appreciate free software as an advantageous alternative to proprietary software, specially for scientific applications.

- Use GNU/Linux in a console environment. Use basic skills in the bash shell, install software packages and keep a system updated.

- Use under GNU/Linux an office suite, and LaTeX text processing tools.

- Make graphical representation of scientific data.

Vicerrectorado de Relaciones Internacionales. Servicio de Lenguas Modernas. Pabellón 8– Campus El Carmen. 21071 - HUELVA. Telef.: +34 959 218232 - Fax: +34 959 219334. email: serv.lenguas.mod@uhu.es

1

- Perform simple statistical data analysis.

- Present a final report where several of the techniques explained have to be applied to a particular problem of interest.

Syllabus indicative content

- Chapter 1 :: Installation of GNU/Linux (Ubuntu Oneiric Ocelot)
- Chapter 2 :: Basic skills using the bash shell
- Chapter 3 :: Basic user skills in GNU/Linux
- Chapter 4 :: Basic administration skills in GNU/Linux
- Chapter 5 :: Scientific applications in GNU/Linux (I): text processing
- Chapter 6 :: Scientific applications in GNU/Linux (II): data representation
- Chapter 7 :: Basic programming skills GNU Octave and GNU R
- Chapter 8 :: Application of the learnt techniques to a problem of interest.

Assessment

Coursework . . . . 60 %

Project . . . . 15 %

Participation . . . . 20 %

Exam* . . . . 100 %

Only for those students that have failed in the standard grading.

Reading list

- Official Ubuntu Documentation (https://help.ubuntu.com/).

- J. Schmidt Hansen, GNU Octave Beginner's Guide. Ed. PACKT Publishing 2011.

- W. John Braun and J. Murdoch, A first course in Statistical Programming with R.

Ed. Cambridge University Press 2007.

 (see also references in the course Moodle website)

*Vicerrectorado de Relaciones Internacionales. Servicio de Lenguas Modernas. Pabellón 8–
Campus El Carmen. 21071 - HUELVA. Telef.: +34 959 218232 - Fax: +34 959 219334. email:
serv.lenguas.mod@uhu.es*

2