

Course: Free and Open Source Software

Course 01

Credits: 4 Coefficient: 2

1 Course Objectives

By the end of this semester, the student will be able to:

- Distinguish between free software and open source software, and understand their importance in today's digital world.
- Master the legal aspects related to free software licenses.
- Use free environments such as GNU/Linux and free software in academic and professional contexts.
- Write scientific documents using LaTeX and efficiently use the LibreOffice office suite.
- Explore a wide range of free and open source software in different fields.
- Carry out an applied project implementing one or more free software tools.

2 Recommended Prerequisites

- Basic knowledge of computer science (computer use, web browsing, file management)
- General knowledge of operating systems

3 Course Content

3.1 Introduction to Free and Open Source Software

- Definitions, history, major contributors
- Differences and similarities between free software and open source software

3.2 Legal and Ethical Aspects

- Copyright and software
- Free licenses: GNU GPL, LGPL, MIT, Apache, BSD
- Concepts of Copyleft and Copyright

3.3 Free Environments

- Presentation of the GNU/Linux system
- Main distributions: Ubuntu, Fedora, Debian
- Basic Linux terminal commands

3.4 LibreOffice Office Suite

- Use of Writer, Calc, Impress
- Comparison with proprietary tools

3.5 Introduction to LaTeX

- Installation and working environment
- Structure of a LaTeX document: titles, tables, figures, bibliography

3.6 Other Free and Open Source Software

- Browsers: Firefox, Chromium
- Graphic tools: GIMP, Inkscape
- Audio/Video: VLC, Audacity
- Educational platforms: Moodle
- Collaborative development: Git, GitHub/GitLab

3.7 Advantages and Limitations of Free Software

- Technical, economic, and social aspects
- Economic models: services, support, freemium

3.8 Practical Project

- Selection, installation, and use of free software in a real context
- Writing a tutorial or mini-report
- Project presentation in class

4 Introduction to Free and Open Source Software

The terms “free software” and “open source software” are often used as synonyms, but they do not mean exactly the same thing.

4.1 Free Software

Free software emphasizes user freedom.

According to the Free Software Foundation (FSF) founded by Richard Stallman, software is considered free if it respects the four fundamental freedoms:

- Freedom 1: To run the program for any purpose.
- Freedom 2: To study how the program works and adapt it to one’s needs (access to source code is required).
- Freedom 3: To redistribute copies of the program.
- Freedom 4: To improve the program and release improvements to benefit the whole community.

The main goal is ethical and social: guaranteeing users’ freedom and autonomy.

Examples:

- GNU/Linux
- LibreOffice
- GIMP

4.2 Open Source Software

The term open source comes from the Open Source Initiative (OSI), created in the late 1990s.

Here, the focus is not on moral freedom but on efficiency and collaboration. The source code is open so developers can inspect, fix, and improve it.

The goal is pragmatic: improving software quality and development transparency.

Examples:

- Apache
- Chromium
- Mozilla Firefox

4.3 Summary

Criterion	Free Software	Open Source Software
Main objective	User freedom	Collaboration and code quality
Origin	Free Software Foundation (FSF)	Open Source Initiative (OSI)
Core value	Ethics, user rights	Technical efficiency
Source code access	Yes	Yes
Freedom to use, modify, redistribute	Yes	Partial

In simple terms:

- Every free software is open source.
- But not every open source software is necessarily free.

Free software uses licenses based on **Copyleft**.

Copyright is a legal right that protects a work by giving the creator exclusive control over reproduction, distribution, and modification.

Copyleft uses copyright law to guarantee the freedom to copy, distribute, and modify a work, provided that derived versions remain under the same freedom conditions.

5 Introduction Questionnaire — Free and Open Source Software

5.1 Multiple Choice Questions

1. What is called free software? A. Free of charge software B. Software whose source code is accessible and modifiable C. Software without a license D. Software owned by a private company
2. The term open source means: A. Software available only on the Internet B. Software whose source code is open to the public C. Software without copyright D. Obsolete software
3. The free software movement was launched by: A. Bill Gates B. Richard Stallman C. Linus Torvalds D. Steve Jobs
4. The GNU project is linked to: A. Microsoft B. Apple C. The Free Software Foundation D. Google
5. Linux is: A. Office software B. A web browser C. A free operating system D. A programming language
6. The GNU GPL license allows: A. Copying and modifying the code under certain conditions B. Total prohibition of redistribution C. Selling the software without mentioning the author D. Commercial use only
7. What is the main difference between “Free” (Libre) and “Free of charge” (Gratuit)?
A. Free means free of charge B. Free refers to freedom of use, not price C. Free of charge means it can be modified

8. The “Copyleft” symbol means: A. All rights reserved B. No rights reserved C. Sharing allowed under the same conditions
9. Ubuntu is a: A. Linux distribution B. Free license C. Office suite D. Processor brand
10. LibreOffice Writer is the free equivalent of: A. Microsoft Word B. Google Docs C. Adobe Acrobat