

Informatics Tools for Statistics

Code: 104849
ECTS Credits: 6

2025/2026

Degree	Type	Year
Applied Statistics	FB	1

Contact

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Teachers

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Teaching groups languages

You can view this information at the [end](#) of this document.

Prerequisites

Because it is a first year course and in the first semester, it has no prerequisite.

Objectives and Contextualisation

The main objectives of the subject are the following:

- Familiarize oneself with the use of an Computer Algebra System or calculating manipulator. This manipulator must be considered as an everyday tool when studying the rest of the subjects.
- Learn how to structure and write scientific texts with the LaTeX word processor.
- Familiarize oneself with the concept of statistical package. In particular, create and transform databases and get used to work environments in graphic mode and command line.
- Learn how to use a command line operating system, taking advantage of their power to merge, separate or extract data from files or file sets.
- Introduce oneself to the formalization of algorithms using a programming language.

Learning Outcomes

1. CM02 (Competence) Solve problems using structured programming, designing suitable algorithms.

2. CM04 (Competence) Programme algorithmic solutions to solve problems within a context linked to statistics.
3. KM05 (Knowledge) Recognise typical structures of advanced programming languages (variables, loops, arrays, lists, dictionaries, tuples, etc.), functions and classes.

Content

1. Brief introduction to computing. Computing resources at the University available to use in the course.
2. Textprocessor (LaTeX): Structure of a TeX file. Edition and compilation. Mathematical formulas. Floating objects.
3. Statistical packs (R): Work environments. Declaration of variables. Creation, obtaining and manipulation of databases. Descriptive tools Graphic environment.
4. Computer Algebra System (Sage): numerical and algebraic calculations. Function graphs. Resolution of equations. Definition of functions. Lists, sets and successions. Logical programming, iterations and procedures.
5. Operating system (Bash): The console. First instructions and obtaining help. Manipulation of files.
6. Programming (Python): Introduction to Python.

Activities and Methodology

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Practice sessions	51	2.04	
Type: Autonomous			
LaTeX document preparation	10	0.4	
Preparing for the exam on a computer algebra system	20	0.8	
Preparing for the exam on an operating system	19	0.76	
Preparing for the exam on the statistical package	20	0.8	
Writing a Python program	20	0.8	

The practice sessions are held in computer rooms or classrooms prepared for the use of laptops.

Annotation: Within the schedule set by the centre or degree programme, 15 minutes of one class will be reserved for students to evaluate their lecturers and their courses or modules through questionnaires.

Assessment

Continuous Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes

Computer algebra system exam	0.26	3	0.12	CM02, CM04, KM05
Final exam	0.43	4	0.16	CM02, CM04, KM05
LaTeX document delivery	0.13	0	0	CM04
Operating system exam	0.17	1	0.04	CM02, CM04
Python program delivery	0.22	0	0	CM02, CM04, KM05
Statistic package exam	0.22	2	0.08	CM02, CM04, KM05

Continuous evaluation activities provide a grade; to pass the subject this grade has to be greater or equal than 5, and the mark obtained on each subject block has to be greater or equal than 3. A time of 4 hours is reserved to re-evaluate any exam that the student failed.

Bibliography

As all work is done on computers, the main source of information will be the *help* of the programs that are used. In addition, as a complementary bibliography we recommend the following online resources.

- Tobias Oetiker, Hubert Partl, Irene Hyna and Elisabeth Schlegl. The not so short introduction to LaTeX2E (or LaTeX in 139 minutes). <https://tobi.oetiker.ch/lshort/lshort.pdf>
- W.N. Venables, D.M. Smith and the R Development Core Team: An introduction to R.<https://cran.r-project.org/doc/manuals/r-release/R-intro.pdf>
- GNU Bash manual, <https://www.gnu.org/software/bash/manual/>
- Python Software Foundation, The Python Language Reference, <https://docs.python.org/3/reference/>
- The Sage Reference Manual, <https://doc.sagemath.org/html/en/reference/>

Software

SageMath, R, Python, LaTeX and GNU/Linux.

Groups and Languages

Please note that this information is provisional until 30 November 2025. You can check it through this [link](#). To consult the language you will need to enter the CODE of the subject.

Name	Group	Language	Semester	Turn
(PLAB) Practical laboratories	1	Catalan	first semester	afternoon
(PLAB) Practical laboratories	2	Catalan	first semester	afternoon
(PLAB) Practical laboratories	3	Catalan	first semester	afternoon