

Basics of statistical inference with R language

BSIr 2223 - Fall 2022

PhD course in Psychological Sciences

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Instructor details

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Course website

<https://elearning.unipd.it/scuolapsicologia/course/view.php?id=4267>

Class materials and Textbook

All the materials used throughout the course (e.g., lecture notes, scripts) will be available on the Moodle page of the course.

The following chapters can be of valuable support (the associated books are available in the University Library “Metelli”):

- Braun, W. J., & Murdoch, D. J. (2021). *A first course in statistical programming with R*. Cambridge University Press. Chapters: 1.1,2,3.1-3.3,4.1-4.5,6,7.1-7.2,8.2,8.5
- Rizzo, M. L. (2008). *Statistical computing with R*. CRC Press. Chapters: 2,5.1-5.3,5.6,6,7.1-7.2,9.2,11.4-11.6

Course description and goals

Through hands-on activities with statistical-based problems, doctoral students will be introduced to the fundamental aspects of statistical inference. The emphasis will be on formulating problems and choosing appropriate solutions using the R programming language. The goal is to prepare doctoral students with the necessary knowledge and skills to solve empirical problems from a statistically-oriented perspective. This course will also boost computing skills in the field of data science, such as probability calculus, estimation and inference, Monte Carlo based integration and sampling, Monte Carlo based inference and hypotheses testing, Bootstrap techniques.

Requirements

High-school linear algebra and analysis, basics of probability (e.g., random variables, density functions, expectations) and statistics (e.g., model parameters, inference, hypotheses testing) as usually covered in undergraduate programs. Supplementary materials to brush-up all these topics are available on the Moodle page of the course.

Final examination

The final exam is written and aims at evaluating the ability to analyse and solve elementary problems using data analysis skills. Further details will be provided during the course.