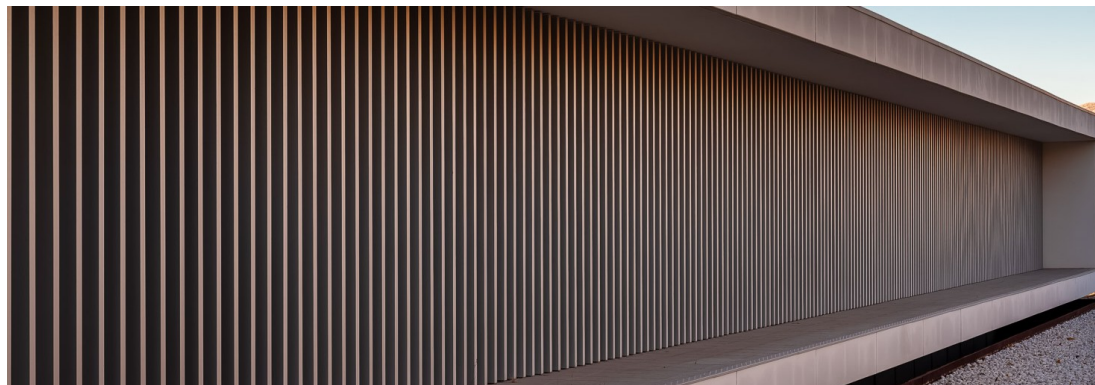




Course: Introduction to Programming and Data Analysis in R (v2027)



- **Course title:** Introduction to Programming and Data Analysis in R (v2027)
- **Instructors:** Filip Andras, Efraín García & Klara Hemmerich
- **Format:** In person
- **Available spots:** 30
- **Duration:** 30 hours, divided into 6 sessions with breaks.
- **Place:** Seminar 4 of the Mind, Brain and Behavior Research Center (CIMCYC)
- **Previous requirements:** Basic knowledge of statistics is required.
- **Language:** This edition of the course will be taught in Spanish.

Description and contents

This course is intended for doctoral students in the health sciences and provides a theoretical and practical introduction to programming and data analysis in R. Throughout the course, you will learn everything from the fundamentals of the language to data manipulation techniques, basic analysis, visualization, and the creation of reproducible research reports.

The course is divided into six sessions, combining theory and practice:

Session 1 — Introduction to programming in R and RStudio

- Why learn to program in the age of AI?
- Introduction to R and RStudio
- Basic programming elements:
 - Operations
 - Variable types (numeric, strings, arrays...)
 - Data structures (vectors, data frames, factors)
 - Libraries and functions
- Tidy data: how to organise your data and the logic of R projects (.Rproj)

Sessions 2 & 3 — Data processing in R

- How to import and export data
- Conditionals (if_else and case_when)
- Introduction to the tidyverse set of libraries, how to chain functions
- Data manipulation (selecting, filtering, creating variables, aggregating and summarising, combining tables)
- Data reshaping (long/wide format)

Session 4 — Data analysis in R

- Descriptive statistics
- Correlation and t-tests
- ANOVA (one-way, repeated measures and mixed)

Session 5 — Data visualisation

- Introduction to the ggplot2 library: the grammar of graphics

Session 6 — Reproducible research reports

- Reproducible reports with Quarto

Schedule

Session planning

SCHEDULE	DAY	DATE	SESSION
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9:00-10:30, 11:00-12:30, 13:00-14:00	Tuesday	6 April	Session 1
9:00-10:30, 11:00-12:30, 13:00-14:00	Wednesday	7 April	Session 2
9:00-10:30, 11:00-12:30, 13:00-14:00	Friday	9 April	Session 3
9:00-10:30, 11:00-12:30, 13:00-14:00	Tuesday	13 April	Session 4
9:00-10:30, 11:00-12:30, 13:00-14:00	Wednesday	14 April	Session 5
9:00-10:30, 11:00-12:30, 13:00-14:00	Friday	16 April	Session 6

Install R and RStudio on your computer

R is a free programming language and statistical environment, widely used in scientific research for data analysis, statistical modeling, graphics and more. RStudio is an integrated development environment (IDE) for R that offers a user-friendly interface with a code editor, console, package management, results viewer and support for generating reproducible reports with Quarto, which makes working with R much easier.

Where to download:

- For R: from the [official R project website](https://www.r-project.org/), choosing the appropriate installer for your operating system (Windows, macOS or Linux).
- For RStudio: from its [official download page](https://www.rstudio.com/products/rstudio/download/#download), selecting the "Desktop" version suitable for your operating system.

Course materials

<http://cimcyc.ugr.es/>

The course materials will be posted in this section. To consult materials from previous editions of the course, go to [the course repository on GitHub](#), click the **Code** icon and then **Download ZIP**.

Registration

Registration must be done through the form on [the website of the Doctoral School of Health Sciences](#), which will be open **from 15 to 21 March 2027**.

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