



# Introduction to R programming and biological data analysis

**Teachers** Inês Fragata & Vitor Sousa (cE3c)

**Note:** This course will be given remotely

**Calendar:** May 5<sup>th</sup>-7<sup>th</sup> 2021

**Duration:** 18 hours

**Schedule:** 9h-12h30 and 14h-17h30m, Wednesday-Thursday; 9h-13h – Friday

## Objectives

Provide students with basic knowledge of R programming, allowing them to manipulate and visualize data with R.

## Topics:

- Introduction to R and R studio
- R Basic syntax
- Introduction to variable types and functions
- Manipulate vectors, matrices and data frames
- Read and load data into R
- Make graphics in R

## Detailed Plan:

- **Introduction to R and R studio:** students will become familiar with the R and R studio environments and will learn how to setup and manage a project using R studio.
- **R Basic syntax:** students will learn how to assign variables, create scripts and print to the console.
- **Introduction to variable types and functions:** the students will learn the different type of variables and learn how to distinguish functions from variables. The students will become familiarized with function syntax and outputs.
- **Manipulate vectors, matrices and data frames:** the students will learn how to create vectors, matrices and data frames and what are their different uses. They will also learn how to access the different data types, and extract information.
- **Read and load data into R:** the students will learn how to import data into R and how to quickly visualize it.
- **Make graphics in R:** the students will learn how to create graphics using basic R plot and how to configure several options. We will also do a quick overview of the ggplot2 package.

**This course can have a recognition of 3 ECTS for FCUL PhD students enrolling in it as part of their first doctoral year.**

**Location:** Faculdade de Ciências da Universidade de Lisboa

**Nº (min, max) students:** 10 – 15

**Minimum formation:** - Bachelor's degree in biology or related areas. No previous knowledge of R is necessary.

**Directed to:** PhD or MSc students in Biology or related areas, and postdocs and other professionals working in related areas

**Fee:** Free for 1st year PhD students of FCUL enrolling in it as part of the curricular year; also free for 1st year PhD students in the Doctoral program Biodiversity, Genetics and Evolution (UP) and Biology and Ecology of Global Changes (UA) when the course counts credits for their formation; in all these cases the delivery of a final report done after the course is mandatory; the course is also free for more advanced PhD students of the BIODIV programme (ULisboa or UPorto); 15 € for other PhD students from cE3c, 30 € for PhD students from institutions of the PEERS network (CFE); 55 € for FCUL Master students, more advanced PhD FCUL students and unemployed (not from cE3c); and unemployed; 80 € for BTI, BI and other PhD students; 115 € for Professional and postdocs.

When the maximum number of students is reached 8 vacancies will be available for non-paying 1st year PhD students mentioned above, being, by order of preference: 1) cE3c students; 2) BIODIV students (not from cE3c); 3) FCUL students (not from cE3c); 4) BEAG students (not from FCUL).

**Deadline for applications:** April 2<sup>nd</sup> 2021

Candidates should send a short CV and a motivation letter to Inês Fragata ([irfragata@gmail.com](mailto:irfragata@gmail.com)) and Vitor Sousa ([vmsousa@fc.ul.pt](mailto:vmsousa@fc.ul.pt)). The cv and letter should be named as 1<sup>st</sup>-lastNAME-CV.pdf and 1<sup>st</sup>-lastNAME-ML.pdf (that is *personalize the name of each file with your first and last name*).

**In the email please add the following information:**

Full Name:

E-mail:

Phone:

Professional activity: Professional/Postdoc, BTI, BI (or other non-post-doc research grant), PhD student (with/ without scholarship), Lic. (Bachelor)/Master student

PhD student of the 1st year of a Doctoral programme at FCUL, BIODIV (FCUL/FCUP), or BEAG (FCUL or UA)?

If yes to the above question, PhD student doing the Course to count credits for 1st year?:

PhD student of cE3c or CEF (Centro de Ecologia Funcional)?:

Name of the PhD programme: