

# Courses 2017-18

**BCAM-Basque Center for Applied Mathematics - Mazarredo 14, 48009 Bilbao, Basque Country, Spain**

**October 23-27, 2017**

**09:00 - 11:00**

**(5 sessions, a total of 10 hours)**

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## INTRODUCTION TO STATISTICAL MODELLING IN R

This course is an introduction to statistical software R. The course will introduce student to the basics of using R for statistical programming, computation, graphics, and modelling.

### OBJECTIVES

- Use R for statistical programming, computation, graphics, and statistical modelling
- Write functions in and use R in efficient way
- Perform basic statistical analysis and basic statistical models

### PROGRAMME

1. Introduction to the R language
  - 1.1. Installation and libraries
  - 1.2. RStudio environment
  - 1.3. Reading and writing data
  - 1.4. Basic arithmetic and matrix operations
  - 1.5. Data frames and lists
  - 1.6. Introduction to functions
2. Graphics
  - 2.1. Basic plotting
  - 2.2. Advanced plotting
3. Standard statistical models in R
  - 3.1. Basic statistics analysis in R
  - 3.2. Probability distributions
  - 3.3. Linear regression and ANOVA
  - 3.4. Generalized Linear Models
4. Advance statistical modelling
  - 4.1. Linear mixed effects Models
  - 4.2. Flexible regression and Generalized Additive Models
5. Case studies

### PREREQUISITES

There are no formal prerequisites, but some basic knowledge of Statistics is expected. The intended audience is anyone who needs a flexible statistical environment for their research. Master and PhD students are encouraged to participate. Every student must bring the laptop computer to the course.

*Registration is free, but **inscription is required before October 18**. So as to inscribe send an e-mail to [roldan@bcamath.org](mailto:roldan@bcamath.org). Student grants are available. Please, let us know if you need support for travel and accommodation expenses.*