



R without fear: an R course in evolutionary ecology

Teacher: Jordi Moya-Laraño (Functional and Evolutionary Ecology, Estación Experimental de Zonas Áridas – CSIC)

Calendar: 24-28 November 2014

Duration: 36 hours

Schedule: 9h-12h30 and 14h-17h30, Monday-Thursday; 9h-13h and 14h-18h Friday

General Plan:

- Introduction to the R working environment
- Variable types in R
- Statistical populations and samples through working examples
- Measurements of central tendency and variability
- Precision, accuracy and bias
- Hypothesis testing: Falsability, Type-I and II errors and statistical power
- Correlation and simple regression
- P-value vs. effect magnitude
- Linear Models: residuals, assumptions and interpretation.
- Explained vs. unexplained variance of a model (the coefficient of determination).
- Building functions in R
- Introduction to graphics in R
- The concept of partial effect: partial regression and correlation
- General Linear Models (GLM)
- Curve fitting in linear models and General Additive Models (GAMs)
- The problem of spatial autocorrelation in ecology and evolution
- Multicollinearity: when is there a problem?
- Additive vs. multiplicative effects: checking and plotting interactions
- Introduction to General and Generalized Linear Mixed Models (GLMM)
- Fixed vs. Random effects and implications for analysis: main R functions
- Introduction to Bayesian statistics: the function MCMCglmm
- Practical examples in evolutionary ecology:
 - The study of natural selection
 - Applications of linear models for quantitative genetics
- Student's case studies.

This course can have a recognition of 6 ECTs for FCUL PhD students enrolling in it as part of their first doctoral year. For students only requiring 5 ECTs recognized in their specific PhD

programmes the last 6 hours of the course are not mandatory and the certificate will be on 'Topics in R without fear'.

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Location: Departamento de Biología Animal (FCUL)

Nº (min, max) students: 10 – 20

Minimum formation: bachelor degree in Biology or related areas

Fee: free for 1st year PhD students in the Doctoral programme in Biology (FCUL), Biodiversity, Genetics and Evolution (UL; UP) and Biology and Ecology of Global Changes (UL, UA); 20 € for PhD students from institutions of the PEERS network (Ce3C, CFE); 100 € for FCUL Master students and unemployed; 150 € for BTI, BI and other PhD students; 200 € for Professionals and postdocs.

Deadline for applications: October 24th, 2014

Candidates should send a short CV and a motivation letter to Jordi Moya-Laraño at the following email address: jordi@eeza.csic.es