Analysing Biological Data: Generalised Linear, Additive and Mixed Modelling
Course Guide

Course professors: Dr. Iñaki Odriozola Larrañaga y Dr. Gonzalo García-Baquero Moneo

Place: *Escuela de Máster y Doctorado*, University of the Basque Country, Leioa

Start date: 5 March. End date: 9 March.

Language: English

1. Introduction

Developing the right analysis for each survey/experimental design is not always obvious and default settings in statistical software may lead to hidden traps for the unwary. As a consequence, much effort may be lost. This course is intended to be a practical introduction for Ph.D. students to the use of linear, additive and mixed statistical models of the reality. These models are useful in both observational and experimental contexts. The course focuses on application, but brief theoretical introductions will be given. Emphasis will be placed on the correct analysis and presentation of data.

2. What to do before the course begins

You do not need to revise any materials before the course starts. The course relies on lecturing, basic arithmetic, verbal reasoning, and computer programming.

You will need a laptop capable of running an internet browser and R software (http://CRAN.R-project.org). Please, try to install R software prior to the beginning of the course. If you have any problem during the installation process, it will be solved the first day. R software will be introduced from scratch.

3. Course contents

Unit 1: Overall introduction and data exploration.

Unit 2: Introduction to linear regression.

Unit 3: Introduction to generalised linear modelling.

Unit 4: Introduction to additive modelling.

Unit 5: Introduction to mixed modelling.

4. Assessment

There will be no assessment.

5. Keeping up to schedule

This is a short but intensive course. We strongly recommend that you devote the whole week to exclusively attend the course and do homework. Otherwise you might not be able to keep up to schedule. Homework will require about four hours per day.

6. References

M. Logan. 2010. *Biostatistical Design and Analysis Using R. A Practical Guide.* Chichester. Wiley-Blackwell.

G. P. Quinn & M. J. Keough. 2002. *Experimental Design and Data Analysis for Biologists*. Cambridge. Cambridge University Press.

C. Ritz & J.C. Streibig. *Nonlinear Regression with R.* New York. Springer.

A. F. Zuur, E. N. Ieno & G. M. Smith. 2007. *Analysing Ecological Data.* New York. Springer.

7. The course team

Prof. Inazio Garin Atorrasagasti, director

Dr. Iñaki Odriozola Larrañaga, course professor

Dr. Gonzalo García-Baquero Moneo, course professor

8. Course Calendar (Jul 2015)

	Afternoon-evening (14:00-18:00)	Morning (9:00-13:00)
5 March	Unit 1	
6 March	Unit 2	
7 March	Unit 3	
8 March	Unit 4	
9 March		Unit 5

There will be one short break.