

Online live course using Zoom

Introduction to Linear Mixed Effects Models and GLMM with R

Provided by: Highland Statistics Ltd

Course format

- Live online teaching is from 09.00-16.00 UK time.
- There are four 7-hour sessions, representing a total of 28 hours of work.
- The course includes a few theory presentations along with a large number of exercises using real data sets. Detailed, annotated R code will be provided, and a brief period will be set aside for practice before each exercise is discussed in depth.
- Self-study is optional.
- On-demand video of all theory presentations and exercises are available. These can be watched online, as often as you want, at any time of the day, within a 12 month period.

A discussion board allows for daily interaction between instructors and participants.

The course fee includes a 1-hour face-to-face video chat with the instructors. You can discuss your own data during this session.

Course content

The course starts with a short revision of multiple linear regression, followed by an introduction to linear mixed-effects models to analyse hierarchical or clustered data, e.g. multiple observations from the same animal, site, area, nest, patient, hospital, vessel, lake, hive, transect, etc.

In the second part of the course GLMMs are applied to continuous (e.g. biomass), binary (e.g. absence/presence of a disease), proportional (e.g. % coverage) and count data using the Gaussian, Poisson, negative binomial, Bernoulli, binomial, beta, and gamma distributions.

This is a non-technical, and easy-to-follow course (provided you are familiar with multiple linear regression and basic GLMs).

Dates: 28, 29, 30 and 31 October 2024

- Online live course: 09.00-1600 UK time.
- On-demand video available.
- Self-study is optional.

Price: £400

Included: 1 hour face-to-face video chat about your data

Instructors:

- Dr. Alain Zuur
- Dr. Elena Ieno

Authors of 12 books and providers of over 250 courses



COURSE CONTENT

Module 1

- General introduction.
- One exercise revising data exploration and multiple linear regression in R.
- Introduction to matrix notation.
- Theory presentation for linear mixed-effects models for nested data.
- Two exercises on linear mixed-effects models with random intercepts.
- Comparing lme4/nlme/glmmTMB results.

Module 2

- One exercise on linear mixed-effects models with random intercepts and slopes.
- Using multiple variances (Generalised Least Squares) to deal with heterogeneity.
- One exercise using GLS.

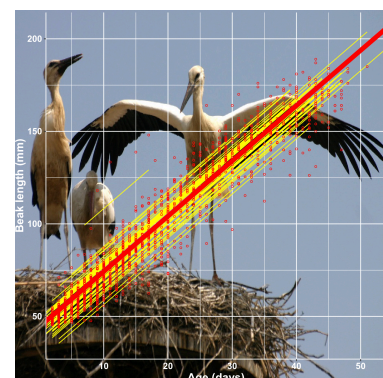
Module 3

- Brief revision generalised linear models (GLM).
- Revision exercise showing how to execute a Poisson GLM and negative binomial GLM.
- Three GLMM exercises:
 - Poisson GLMM for the analysis of count data.
 - Negative binomial GLMM for the analysis of count data.
 - Time allowing: Negative binomial GLMMs with two-way nested and crossed random effects.

Module 4

- Exercise showing how to apply a Bernoulli GLMM for the analysis of absence-presence data.
- Exercise showing how to apply a beta GLMM for the analysis of coverage data.
- Exercise showing how to apply a gamma GLMM for the analysis of continuous positive data (without zeros).
- Time allowing: Exercise showing how to apply a Tweedie GLMM for the analysis of continuous positive data (with zeros).
- Time allowing: Exercise showing how to apply a binomial GLMM for the analysis of proportional data.

We will predominately use the glmmTMB package in R.



GENERAL INFORMATION

COURSE FEE: £400

- Credit card payments are charged in GBP currency.
- VAT charge:
 - UK participants are charged 20% VAT.
 - Non-EU participants (including Norway) are not subject to VAT.
 - We do not have to charge VAT to EU participants who provide their [institutional VAT number](#).
 - EU participants who do not provide a VAT number will be charged VAT at their national rate.

Course participants will be given access to the course website with all the videos, data sets, R solution code and course material 2 weeks before the start of the course.

COURSE TIMES

Monday - Friday: 09.00am to 16.00pm including 1 hour lunch break and a 20 minutes break both morning and afternoon.

FREE 1-HOUR FACE-TO-FACE MEETING

The course fee includes a 1-hour face-to-face meeting with one or both instructors. The meeting needs to take place within 12 months after the last live zoom session. You can discuss your own data, but we strongly advise that the statistical topics are within the content of the course. The 1-hour needs to be consumed in one session, and will take place at a mutual convenient time.

PRE-REQUIRED KNOWLEDGE:

Working knowledge of R, linear regression, and Poisson, negative binomial and Bernoulli GLM. This is a non-technical course. Revision material (on-demand video) is provided.

CANCELLATION POLICY:

What if you are not able to participate? Once participants are given access to course exercises with R solution codes, pdf files of certain book chapters, pdf files of powerpoint files and video solution files, all course fees are non-refundable. However, we will offer you the option to attend a future course or you can authorise a colleague to attend this course. Terms and conditions see: <http://highstat.com/index.php/sign-up2>

GENERAL

- Please ensure that you have system administration rights to install R and R packages on your computer.
- Instructions what to install is on the course website.
- The course material consists of relevant pdf files of presentations, data sets and clearly documented R code.

REGISTRATION

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Payment via credit card or bank transfer

