**Introduction to R for Biologists (And Others) 2018**

Students enrolled on this module are presumed to have read the pre course reading material and “maybe” have some idea about basic stats but complete beginners are welcome.

**MODULE DETAILS**

**Module manager:** Dr T C Cameron **Room:** 4.14

**E-mail:** [tcameron@essex.ac.uk](mailto:tcameron@essex.ac.uk)

Further module information and supporting learning resources are available on MOODLE.

**MODULE AIMS**

By the end of the course, students will understand the use and interpretation of modern statistical methods and their implementation in the statistical package R. The course is designed as an introduction or refresher course to working with data, data visualisation and statistical inference using R. More advanced topics will be delivered in a later course. This course would be suitable for 1st year PhD students as an introduction, and 2nd years as a refresher. This is a “crash course” to get you confident in beginning your R journey and starting to work with your own data.

**MODULE OUTLINE**

The module will consist of practical training and exercises in:  
Use of the freeware R for general data handling, plotting and statistical data mining. Use and interpretation of modern statistical methods including General Linear Models (e.g. regression and ANOVA) & Generalised Linear Models (working with non-normal data) and their application to biological problems.

Each day comprises of a morning and afternoon session, including lecturer instruction and practical material. **PLEASE NOTE: If you have your own laptop please bring it with you, fully charged, and with the most recent version of R and R studio installed.** This will be an insurance if there are any problems with or not enough cluster PCs. But most cluster PCs should have R and R studio installed.

### TEACHING STAFF

Dr Tom Cameron

Dr Etienne Low-Decarie

**NOTE If you have a question about the R programming in the practicals ask during a practical. Or we can all help each other via the discussion service on the course pages in MOODLE. Please do not send “I’m stuck” emails to course staff unless given permission to do so.**

**MODULE TIMETABLE**

Timetable information is correct at time of printing. Fridays topics are dependent on progress and what the class wants to do. Supporting learning resources are available in the MOODLE.

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| **Week** | **Date** | **Time** | **Finish** | **Location** | **Topic** | **Lecturer** |
| 15 | Mon  8/1/17 | 09:30 | 11:30 | PC/IT Lab M | Getting started in R | ELD |
| 12:30 | 14:30 | Data and projects in R-Studio |
| 14:30 | 17:00 | Introduction to plotting in ggplot2 |
| Tues  9/1/17 | 09:30 | 11:30 | Basics of programming in R (functions, control structures) |
| 12:30 | 14:30 | Summarizing and transforming data using the dplyr package |
| 14:30 | 17:00 | Advanced graphics with the ggplot2 package, including mapping |
| Wed  10/1/17 | 09:30 | 10:30 | Introduction to statistical inference | TCC |
| 10:30 | 12:00 | Linear model families |
| 13:00 | 14:00 | Linear Modelling |
| 14:00 | 17:00 | Linear Modelling |
| Thurs  11/1/17 | 09:30 | 10:30 | Introduction to generalised linear models (GLMs) |
| 10:30 | 12:00 | GLMs |
| 13:00 | 14:00 | Advanced GLMs |
| 14:00 | 17:00 | GLMs |
| Friday  12/1/17 | 09:30 | 10:30 | Mixed models intro |
| 10:30 | 12:00 | Mixed Models intro |
| 13:00 | 14:00 | Multivariate intro |
| 14:00 | 17:00 | Multivariate intro |

**MODULE ASSESSMENT**

There is no module assessment.

**AUDIO RECORDINGS MADE DURING LECTURES**

Audio recordings made by students in lectures are made under the understanding that they will be used exclusively for the purposes of that individual’s private study and not shared with others. Files can be accessed for individual use.