

## Statistical Modelling with R

From the very beginning, R was designed for statistical modelling. Out of the box, R makes standard statistical techniques easy. This course covers the fundamental modelling techniques. We begin the day by revising hypotheses tests, before moving onto ANOVA tables and regression analysis. The class ends by looking at more sophisticated methods such as clustering and principal components analysis (PCA).



### Course Outline

- **Basic hypothesis testing:** Examples include the one-sample t-test, one-sample Wilcoxon signed-rank test, independent two-sample t-test, Mann-Whitney test, two-sample t-test for paired samples, Wilcoxon signed-rank test.
- **ANOVA tables:** One-way and two-way tables.
- **Simple and multiple linear regression:** Including model diagnostics.
- **Clustering:** Hierarchical clustering, k-means.
- **Principal components analysis:** Plotting and scaling data.

### Learning Outcomes

By the end of the course, participants will...

- have a thorough understanding of popular statistical techniques
- have the skills to make appropriate assumptions about the structure of the data and check the validity of these assumptions in R
- be able to fit simple and multiple regression models in R
- understand how to apply said techniques to their own data using R's common interface to statistical functions
- be able to cluster data using standard clustering techniques

### Attendee Feedback

- “Really enjoyed the course and it will all be very useful for me in my PhD studies, thanks Jamie!”
- I am not a fan of stats, I prefer programming not strictly related to data analysis. BUT this is something I will also need during my PhD and it was a really useful course. Jamie was able to explain the general ideas behind the different statistical tests and was also happy to go deeper for more expert people. And, most important, he showed us how to do those stats in R, which is the language we use in our lab. Kind and nice as always, he also structured the timing of the course such a way that we could have proper breaks and survive :)”