



**Data Science:  
Statistical programming with R (S24)  
08-12 July 2024**

Course Director: Dr. Laurence E. Frank  
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Day	Time	Type	Description	Location
Monday	09:00 – 12:00	Lecture, computer lab, Plenary discussion	Welcome. Introduction tot the R environment (RStudio) and the online resources. Introduction to reproducible data analysis with R Markdown.	The entire course will take place in:  <a href="#">Victor J. Koningsberger building</a> , room Pangea
	12:00 - 13:00	Lunch Break	In <a href="#">Educatorium</a>	
	13:15 - 16.30	Lecture, computer lab, Plenary discussion	R programming basics: objects and data types, data manipulation.	
Tuesday	09:00 – 12:00	Lecture, computer lab, Plenary discussion	Data manipulation with tidyverse. Pipe operator. Recoding and transforming variables.	
	12:00 - 13:00	Lunch Break	In <a href="#">Educatorium</a>	
	13:15 - 16.30	Lecture, computer lab, Plenary discussion	Data visualisation with ggplot2. Uni- and bivariate plots. Plots for numerical and categorical data. Plot arrays and faceting.	
Wednesday	09:00 – 12:00	Lecture, computer lab, Plenary discussion	Fitting linear models. Continuous and categorical predictors. Polynomials and splines. Interactions.	
	12:00 - 13:00	Lunch Break	In <a href="#">Educatorium</a>	
	13:15 - 16.30	Lecture, computer lab, Plenary discussion	Model diagnostics. Linearity, normality, homoscedasticity and outliers.	
Thursday	09:00 – 12:00	Lecture, computer lab, Plenary discussion	More advanced statistical programming: write your own function, for loops.	
	12:00 - 13:00	Lunch Break	In <a href="#">Educatorium</a>	



	13:15 - 16.30	Lecture, computer lab, Plenary discussion	Inferential models and resampling (bootstrap).	
Friday	09:00 – 12:00	Lecture, computer lab, Plenary discussion	Report the results of data analyses in publication ready tables and other communication modes in Rmarkdown. Apply what you learned in this course on a data set: the entire data analysis cycle (import, tidy, transform, visualise, model, communicate the results) and make a report or presentation.	
	12:00 - 13:00	<i>Lunch Break</i>	In <a href="#">Educatorium</a>	
	13:15 - 16.30	Lecture, computer lab, Plenary discussion	Presentations of statistical analyses with slides or report.	

In the morning, at around 10:00, there will be coffee and tea breaks. Additionally, in the afternoon around 15:30, breaks will include sodas and fruit.

For information about the Social Programme, please visit the [Utrecht Summer School website!](#)