

# **Introduction to Statistics with R 2021**

## **General Description**

This course, presented over nine weeks, offers an introduction into the application of the programming language R to statistical analysis. R is statistical software particularly powerful in data analysis and graphical representation.

## **Outcomes**

Participants who complete this course should be able to perform basic data manipulation; descriptive data analyses including graphical representations; and some basic inferential statistics in R. It should also offer a sufficient platform on which to further develop their competencies in R to handle more advanced applications on their own.

## **Target audience**

This course is aimed at anyone interested in strengthening their research capacity in terms of basic statistical understanding and its application using the popular statistical programming software R. General computer literacy as well as some prior knowledge of basic mathematics and statistics are recommended.

## **Assessment**

This course will not be formally assessed. Attendance at all sessions and completion of all quizzes and assignments will ensure a certificate of attendance.

## **System Requirements**

- Stable internet connectivity that will allow for effective live contact sessions.
- A desktop or laptop computer with at least 256 MB of RAM.
- Recent Windows or Mac operating systems.
- Administrative privileges to install and run R utilities.
- R (version 3.6.x) and RStudio Desktop installed on your devices. Details and support for installation will be provided on registration.

## **Course Includes Introductions To:**

- the software package R and the user interface RStudio;
- using R Packages;
- reading and writing data in R;
- operators, basic sampling, and data structures;
- base graphics and introducing the popular graphics package *ggplot2*;
- simple programming and writing functions in R;
- data wrangling;
- probability distributions and inferential statistics in R;
- regression;
- basics of machine learning

## **Duration:**

9 weeks: 11 October – 10 December

**Format:**

For every week in the 9-week programme there will one live (synchronous) session of about an hour, where the material of that week will first be presented. These live sessions will be on Mondays from 1:00 pm until 2:00pm. Attendance at these sessions are a requirement of the course, so please ensure that you have scheduled all the sessions in advance.

After each live session you will also be required to complete a short and relatively simple online quizz designed purely to allow you to test your grasp of what was presented in the live session. These quizzes should take no more than about half-an-hour and should be completed as soon as possible after the live sessions. The quizzes will be open on the same day as the live sessions from 2:00pm until midnight.

You will then be required to work on a more challenging assignment, designed to practice the work covered in that week as well as challenge your grasp of the material. These assignments will not be assessed, although solution memos for self-assessment will be published on Friday mornings. The participants will randomly be divided into two different groups every week and each group will be assigned a facilitator to offer support for the assignments. The support will be in the form of a one-hour online session every Wednesday between 1pm and 2pm. Attendance of these sessions is voluntary.

A special session on Monday 11 October at 9am will be available for participants requiring assistance in installing the necessary software. It is however strongly recommended that you follow the instructional video on getting set-up prior to starting the course.

A final wrap-up session will be held between 1pm and 2pm on 10 December, the final day of the course.

**Detailed Programme:**

Week	Date	Time	Description	Type	Mandatory
	11 October	9am – 10am	Support for participants struggling to install the required software	Live Online	No
1	11 October	1pm – 2pm	Session 1	Live Online	Yes
	11 October	2pm - midnight	Quiz 1	Online	Yes
	13 October	1pm – 2pm	Assignment 1: Support	Live Online	No
	15 October	8am	Release of Memo 1		
2	18 October	1pm – 2pm	Session 2	Live Online	Yes

	18 October	2pm - midnight	Quiz 2	Online	Yes
	20 October	1pm – 2pm	Assignment 2: Support	Live Online	No
	22 October	8am	Release of Memo 2		
3	25 October	1pm – 2pm	Session 3	Live Online	Yes
	25 October	2pm - midnight	Quiz 3	Online	Yes
	27 October	1pm – 2pm	Assignment 3: Support	Live Online	No
	29 October	8am	Release of Memo 3		
4	1 November	1pm – 2pm	Session 4	Live Online	Yes
	1 November	2pm - midnight	Quiz 4	Online	Yes
	3 November	1pm – 2pm	Assignment 4: Support	Live Online	No
	5 November	8am	Release of Memo 4		
5	8 November	1pm – 2pm	Session 5	Live Online	Yes
	8 November	2pm - midnight	Quiz 5	Online	Yes
	10 November	1pm – 2pm	Assignment 5: Support	Live Online	No
	12 November	8am	Release of Memo 5		
6	15 November	1pm – 2pm	Session 6	Live Online	Yes
	15 November	2pm - midnight	Quiz 6	Online	Yes
	17 November	1pm – 2pm	Assignment 6: Support	Live Online	No
	19 November	8am	Release of Memo 3		
7	22 November	1pm – 2pm	Session 7	Live Online	Yes
	22 November	2pm - midnight	Quiz 7	Online	Yes
	24 November	1pm – 2pm	Assignment 7: Support	Live Online	No
	26 November	8am	Release of Memo 7		

8	29 November	1pm – 2pm	Session 8	Live Online	Yes
	29 November	2pm - midnight	Quiz 8	Online	Yes
	1 December	1pm – 2pm	Assignment 8: Support	Live Online	No
	3 December	8am	Release of Memo 8		
9	6 December	1pm – 2pm	Session 9	Live Online	Yes
	6 December	2pm - midnight	Quiz 9	Online	Yes
	8 December	1pm – 2pm	Assignment 9: Support	Live Online	No
	10 December	8am	Release of Memo 9		
	10 December	1pm – 2pm	Wrap-up and Feedback	Live Online	Yes

**Presenters:**

Mr Hans-Peter Bakker will be the principal presenter. He will be supported by Professor Sugnet Lubbe from Stellenbosch University's Department of Statistics and Actuarial Science.