

# Course : R environment, data processing and statistical analysis

*Practical course - 2d - 14h00 - Ref. TDA*

*Price : 1680 CHF E.T.*

★★★★☆ 3,8 / 5

An open source software environment and language, R specializes in statistical processing. This course will teach you how to program in R, use the R studio editor, exploit data visualization possibilities and apply fundamental statistical algorithms: regressions, PCA, CAH.

## Teaching objectives

At the end of the training, the participant will be able to:

- ✓ Know how to install and use the R analysis environment
- ✓ Import and export data
- ✓ Recognize the different types of objects in R
- ✓ Creating analysis programs with R
- ✓ Be able to perform basic statistical analyses with R
- ✓ Understanding how to manipulate data with R
- ✓ Graphical presentation of results

## Intended audience

Engineers, data analysts, statisticians, developers in statistical environments or anyone interested in statistical analysis with R.

## Prerequisites

Familiarity with the Microsoft Windows environment and basic knowledge of statistics.

## Practical details

### Exercise

Practical application of theoretical knowledge on a variety of data sets.

## Course schedule

### PARTICIPANTS

Engineers, data analysts, statisticians, developers in statistical environments or anyone interested in statistical analysis with R.

### PREREQUISITES

Familiarity with the Microsoft Windows environment and basic knowledge of statistics.

### TRAINER QUALIFICATIONS

The experts leading the training are specialists in the covered subjects. They have been approved by our instructional teams for both their professional knowledge and their teaching ability, for each course they teach. They have at least five to ten years of experience in their field and hold (or have held) decision-making positions in companies.

### ASSESSMENT TERMS

The trainer evaluates each participant's academic progress throughout the training using multiple choice, scenarios, hands-on work and more. Participants also complete a placement test before and after the course to measure the skills they've developed.

## 1 Introduction

- Introduction to R software and its features.
- Advantages and disadvantages.
- Access to the tool download site and installation.

### Hands-on work

Installation of the analysis environment.

## 2 First steps

- Basic environment (console, script).
- Using the console.
- Create and save a script.
- The directory under R Installation.
- Help and comments.
- Other editors include Tinn-R and R Studio.

### Hands-on work

Console operations. Scripting.

## 3 R objects and programming concepts

- Objects of type vector, matrix, array, factor, data.frame, list.
- Object manipulation, object classes, specific functions, joins.
- Save, delete memory.
- Notions of loop (for and while), condition (if), switch.

### Hands-on work

Write R programs that manipulate object types.

## 4 Creating and using functions

- Function structure.
- Mathematical functions.
- String functions.
- Time/date functions.
- Set operations.
- Contingency tables.

### Hands-on work

Create functions and use them in R programs.

## 5 Data generation, management and visualization

- Data: regular and random sequences.
- Sample data from R.
- Import and export data.
- Modify object data.
- Examples of graphs built with R.
- Creation of basic graphics.
- Chart options, sharing a chart window, saving a chart.

### Hands-on work

Application exercises on data, graphical presentation of results.

### TEACHING AIDS AND TECHNICAL RESOURCES

- The main teaching aids and instructional methods used in the training are audiovisual aids, documentation and course material, hands-on application exercises and corrected exercises for practical training courses, case studies and coverage of real cases for training seminars.
- At the end of each course or seminar, ORSYS provides participants with a course evaluation questionnaire that is analysed by our instructional teams.
- A check-in sheet for each half-day of attendance is provided at the end of the training, along with a course completion certificate if the trainee attended the entire session.

### TERMS AND DEADLINES

Registration must be completed 24 hours before the start of the training.

### ACCESSIBILITY FOR PEOPLE WITH DISABILITIES

Do you need special accessibility accommodations? Contact Mrs. Fosse, Disability Manager, at [psh-accueil@orsys.fr](mailto:psh-accueil@orsys.fr) to review your request and its feasibility.

## 6 Statistical analysis

- Introduction to the notion of package (library).
- Download packages.
- Some useful packages.
- Multiple linear regression.
- The case of principal component analysis (PCA).
- The case of CAH classification.

### Hands-on work

Continued writing of statistical programs, integration of packages.

## Dates and locations

### REMOTE CLASS

2026 : 22 June, 5 Oct., 14 Dec.