



**SAS**  
International  
Interdisciplinary  
Intersectoral



HR EXCELLENCE IN RESEARCH

School of Advanced Studies

## **SAS ACTIVITIES 2016 to acquire transferable skills**

*Statistics and Data management*

# **Statistics and Data Management**

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UNICAM

Introduction to R. The R environment. Installing R-packages. Essentials of the R language. Objects. Vectors, matrices, arrays, factors, lists, data frames. Functions and arguments. Managing data with R: reading, importing and saving data; subsetting. Introduction to statistics. Definitions. Experimental design and data sampling. Random sampling. Replication.

Pseudoreplication. Autocorrelation. Inference.

Descriptive statistics and graphics. Summary statistics and graphical display of distributions.

Probability and distributions

Estimation and hypothesis testing. Statistical tests. Null hypothesis. Significance. One-sided and two-sided tests.

Power of a test.

One-sample tests. Testing distribution normality. One-sample t-test. Wilcoxon signed-rank test.

Two-sample tests. Comparing two variances. Comparing two means. Tests on independent samples: t-test;

Wilcoxon-Mann-Whitney rank-sum test and Mann-Whitney U-test. Tests on dependent samples or paired data: paired t-test;

Wilcoxon test. Testing for independence in contingency tables.

K-sample tests. Analysis of variance. One-way, independent measures ANOVA, pairwise comparison and multiple testing.

Kruskal-Wallis test. One-way, repeated measures ANOVA. Friedman's test.

Correlation

Regression. Simple linear regression, non-linear regression, multiple regression.

Analysis of covariance

Each part of the program will be composed of theory, examples, and exercises using R. Individual PC needed

Camerino 2016

**May 23** from 9 am to 1 pm

**May 24** from 3.30 pm to 5.30 pm

**May 25** from 9 am to 1 pm

**May 26** from 3.30 pm to 5.30 pm

**May 26** from 9 am to 1 pm

SAS Computer Room