DIPARTIMENTO
DI ECONOMIA E DIRITTO

SAPIENZA
UNIVERSITÀ DI ROMA

SAPIENZA, UNIVERSITY OF ROME

Doctoral School of Economics

COMPUTATIONAL TOOLS FOR STATISTICS

Academic Year 2020-2021

(Teacher: Prof. Alberto Arcagni)

SYLLABUS:

The course is an introduction to statistical computing with R. The program of the course is divided into five parts: introduction, descriptive statistics, multivariate analysis, probability, and numerical analysis.

The first part is an introduction to the basics of programming (objects, classes, functions, methods, control flows, and loops).

Through applications in descriptive statistics, in the second part, we describe the main functionalities of R for data manipulation and graphical representation.

The multivariate analysis focuses on linear regression, principal component analysis, and cluster analysis.

In the fourth part, we analyze the tools available to represent the distribution models, and for the pseudo-random number generation.

Finally, in the last part, we use numerical optimization, root-finding, and numerical integration to estimate model parameters, to realize new distribution models, and to design simulation studies.