

# Introduction to Robust Statistics

Laura Ventura  
PhD School in Statistics

## Course Description

This course attempts to give an introductory account to robustness theory and to show how robust inferential procedures may routinely be applied in practice. The aim is to provide specific techniques for handling outliers and small deviations from model assumptions. To this end, robust inference (estimation and hypothesis testing) is reviewed and numerical illustrations in several models are discussed.

## Objectives

The objectives of this course are:

- to introduce the main concepts of robust statistics;
- to learn theoretical, applied and computational methods for robust analyses;
- to learn how robust inferential procedures may routinely be applied in practice.

## Schedule

5 November 2014 (10.30-13.30): Introduction to robust statistics.

12 November 2014 (10.30-13.30): Robust inference and analyses.

## Recommended texts

Hampel, F.R., Ronchetti, E.M., Rousseeuw, P.J., Stahel, W.A. (1986). *Robust Statistics. The Approach Based on Influence Functions*. J.Wiley, New York.

Heritier, S., Cantoni, E., Copt, S., Victoria-Feser, M.P. (2009). *Robust Methods in Biostatistics*. J.Wiley, New York.

Huber, P.J. (1981). *Robust Statistics*. J. Wiley, New York.

Huber P.J., Ronchetti E.M. (2009) *Robust Statistics*, J.Wiley, New York.

Maronna, R.A., Martin, R.D., Yohai, V.J. (2006). *Robust Statistics: Theory and Methods*. J.Wiley, New York.

Staudte, R.G., Sheather, S.J. (1990). *Robust Estimation and Testing*. J.Wiley, New York.

Venables, W.N., Ripley, B.D. (2002). *Modern Applied Statistics with S*. Springer, New York.