

**Spatial Statistics**  
PhD School in Statistical Sciences, University of Padua

**Instructor** Carlo Gaetan, DAIS - Ca' Foscari University of Venice

**Course Description**

This course is designed to introduce the students to statistical models for spatial data. The course will cover methods for the two major topics of spatial statistics : (i) point-referenced data, (ii) areal/lattice data, and (iii) point processes. Students will also be introduced to the computational aspects of spatial statistics, illustrating the main packages in R for the analysis of spatial data. The real data examples mainly come from environmental sciences.

**Tentative Schedule**

10	November	9.00-13.00	Point-referenced data: spatial processes; stationarity. Variogram and covariance functions. Estimation of parameters of a spatial process. Spatial prediction and kriging.
17	November	9.00-13.00	Areal/lattice data: spatial autocorrelation, Markov random fields. Statistical inference for Markov random fields.
20	November	9.00-13.00	Hierarchical Models for spatial data.

**Recommended text**

- Gaetan, C. and Guyon, X. (2010) Spatial Statistics and Modeling, Springer, New York.